Doing Education at Wetland Sites

Examples and Modalities from Asia

Edited by Bishnu B. Bhandari Osamu Abe Masahiro Takahashi Akihiro Nakahata





Institute of Global Environmental Strategies (IGES) • Ramsar Center Japan (RCJ) • Mahidol University • 2003

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FOREWORD

Wetlands are one of the most productive environments in the world. They are the "supermarket" of biological diversity.

While wetlands have been dwindled world-wide due to overuse, pollution, conversion into residential use and dumping sites there are also concrete evidences of intensive campaigns under way to conserve and use them wisely.

By this account, it can be said that two major issues appear at the stake which needs to be immediately addressed. They are; (1) stop their depletion and deterioration and (2) prevent further deterioration.

Since human actions are the main cause of their destruction, it should be our duty and responsibility to awaken people by educating on the danger of overuse as well as the joys of conservation and wise use. The positive and negative accounts of wetlands will help people weigh the gravity of issues and enable them to set the priority. It is against this context that the idea of bringing regional wetland educators together was conceptualized, particularly to evaluate the community-based educational package prepared by the IGES/EE Project on the wise use of wetlands. The title of the workshop was baptized *Workshop on the Evaluation of Educational Materials*. The workshop was held for three days (7-9 January 2003) at Kasetsart University in Bangkok, Thailand.

The main goal of the workshop was to provide a forum for wetland educators, practitioners, scientists and mangers to discuss about educational material so that information, knowledge and wisdom on the wise use of wetlands can be disseminated effectively across the Asia-Pacific. It was envisaged that regional workshop would provide a platform to achieve this goal. The goal was further broken down into the several objectives. These objectives are;

1. Share current knowledge, issues and experiences in wetland education,

- 2. Evaluate the appropriateness and usefulness of the educational materials on wetland conservation.
- 3. Seek out practical ways of disseminating wetland knowledge and information to the stakeholders.

IGES/EE Project and Ramsar Center Japan (RCJ) organized the workshop in cooperation with Faculty of Environmental Resources Studies, Mahidol University, Thailand.

Since this workshop was activity-based, two-thirds of the time was devoted on discussion (sharing new ideas, experiences, methodologies, tactics, etc.) and one-third on the sharing of experiences from case studies. A visioning exercise was also conducted to stimulate discussion and to determine the course of action for disseminating the materials effectively

A total of 30 participants attended the workshop representing universities, NGO, research organizations and professional organizations. The provisional list of participants is presented in Annex A.

The Doing Education at Wetland Sites: Examples and Modalities from Asia is the output of the workshop. The document consists of four chapters (1) case studies from 14 sites representing 11 countries, (2) perspectives on environmental education – the output of the panel discussion, (3) community-based educational package, and (4) visuals and views including three annexes.

Many individuals made their contribution directly or indirectly to the success of this workshop. Due to space constraints, naming them all is not possible here. On behalf of organizers we would like to put on record our deep appreciation and gratitude to all of them.

Last but not least, we would like to express our deep appreciation to our project secretary Ms. Chikako Sugawara for her design and layout of this document. Without her cooperation this book would not have been possible. We would like to give her our "big thank you".

The Editors 6th May 2003

CHAPTER 1

Case Studies



BANGLADESH

The Down-to-Earth Education

Sanowar Hossain and Nasimul Haque Bangladesh, Poush

The first and foremost distinction between many countries and Bangladesh is the nature of relationship that exists between its people and wetlands. An overwhelming majority directly depend on wetland resources and services for livelihood. Communities are most densely settled in and around wetlands, and for centuries the society adapted a culture that maintained a close relationship between nature and human actions especially the recognition of its significance and respect for its contributions to the society. Local traditions and customs evolved through the undertaking and discharging the duties and responsibilities necessary to sustain wetland existence, functions and attributes.

Those days have given rise to a new era of norm, rationality and institution. Wetlands and *beels* are vanishing or degrading due to population pressure, demand on the wetland products for distant markets including the sustenance of local population and infrastructures that prevent wetlands, particularly floodplains, from maintaining their ecological and hydrological functions. In addition, government policies and institutions that govern access, control and utilization of wetlands have weakened traditional customs and practice of wetland governance leading to poverty and stressed ecosystems.

Wetland education in Chanda Beel

Bangladesh Centre for Advanced Studies (BCAS), an NGO undertakes programs to enable local community to assess their wellbeing, manage natural resource wisely and take actions and measures to conserve the environment and biodiversity. To do so, awareness programs of the effects and impacts of resource use on environment have been developed for the community. Focused discussions, leaflets, booklets, and other communication materials have been produced and disseminated. A *Bangla Magazine* and the *Jalabhumi Barta* (floodplain news) are also published. These media act as forums for local people to communicate their concerns, findings and actions on matters related to wetlands and biodiversity conservation and their products or services.

Over 10 school and college clubs have been formed. These clubs are learning and beginning to apply their knowledge on the management of conservation. The awareness campaign has also used international days (Earth Day, Environment Day, Women's Day, Language Day and National Fisheries Week) to organize events and cultural programs including songs, drama and drawing competition for children.

Our experience shows that awareness raising or even community education alone is not enough for people to stop unsustainable resource exploitation. Other factors that need to be taken into consideration are;

- Gradual changing of community values
- Availability of alternative means
- Control (or ban) on unsustainable activities, where necessary

The effectiveness of learning should be monitored, along with changes in the community's attitude to the need for resource conservation and co-management initiatives.

Biodiversity assessment through wetland education

A comprehensive biodiversity survey was carried out in parts of the floodplains in 1996-1997 under the bio-diversity study program (BSP). Since then, a comprehensive approach to assess the state of biodiversity using community participation has been adopted and sustained. The focus of the assessment exercise is not so much in accuracy, but in the process of changing people's perception and developing their capacity to draw references and lessons from them. Since local people need to act on conserving their bio-diversity, it is essential that they understand how and why such exercises are necessary so that they can carry them on a regular basis.

Wildlife are recorded using line transect sampling method. Five transects for each of three intervention areas (Beel Chanda, Betgram and Kadambari) were undertaken. The length of each transect is 2 km. The walking team usually consists of four to six persons, three from the project team and three local community members. Every individual species on both sides of the walk within identifiable distance is recorded. Rats, mongoose, civets and lizards are observed frequently. Information obtained are summarized and shared at meetings of the Village Management Committee.

The species-wise populations of turtles were recorded from observation points at Jalirpar and Satpar hats and bazars. Every week during hat and once every week at *bazar*, observations and information from traders were recorded. On an average, 60-70 turtles are sold as meat at each *hat*, and 25-30 during a daily *bazar* in the two locations. The findings help local communities, clubs and turtle watch members to promote awareness and concern and to influence their prevention activities related to disturbances of habitats, particularly during the breeding season

During June-December, snails are collected from the wetland areas and traded at collection centers at many places in Baghiar Beel. Monthly volumes of trade were recorded for each center. During the peak period of September about 2500 tons are harvested, almost 50% of which are juvenile. Snail habitats are also closely monitored and results shared among the Union Parishad and local communities.

For migratory winter birds, sightings are organized at dawn and dusk during November to February in beel areas and spot observations in the hats and bazars of the project area (particularly Satpar and Jalirpar). Over 100-150 migratory birds are sold daily at each *hat* and *bazar* during the winter season. The information from the observation is summarized and shared with the Union Parishad, the *bazar* and *hat* management committee and local community.

There are three riverine dolphin observation points along the *Madhumati-Kumar* Beel Route Canal from where dolphin population is assessed every month by recording observations of divers over an hour period. The findings are shared among fisher folk community and the settlements along the Canal, including the Union Parishad, environment clubs, schools and NGOs. This information has encouraged people in the community to take any actions or decisions jointly.

The type of fish caught, composition and volume is recorded from catch samplings at fish markets, *hats*, and the collection and trading centers. Household fish consumption monitoring 402 selected families in 22 villages also provides consumption figures. It is estimated that an average of 30 tons of fish are harvested in the project area every day, the peak period being in December-January when the catches from *kua* (ditch or depression) and permanent lowland (from abstraction of water) enters the supply. The harvest reaches as much as 50 tons per day. Over 80% of the catch is supplied to Dhaka.

Flora is recorded by the use of quadrate sampling method. Tree diversity with its species and population are recorded from 100 m x 100 m quadrate. From every quadrate, five quadrates of 10 m x 10 m are made at four corners and one in the center. These five quadrates are sampled for shrubs, creepers and herbs. Aquatic weeds and plants (floating and submerged) are sampled from 10 m x 10 m quadrates at five sites on a monthly interval in the *beel* area during June to December. The collected information is compiled and shared among the relevant community members and households.

Education and awareness program in a coastal area

Bangladesh POUSH, an environmental NGO has taken a' lead in informing, educating and communicating knowledge and concerns

with regard to coastal wetlands. The program covers coastal area in Chakaria and Cox Bazar through awareness raising methods and materials. This initiative which is ongoing since 1997 has generated active interest and support from the targeted communities, local actors and the local government.

Wetlands in the coastal area are affected by natural and human induced changes. Deforestation, conversion into shrimp farms, settlement pressure and over exploitation have lead to degradation and destruction of wetlands particularly as these activities have disrupted breeding and feeding sites for various faunal species. Traditional management systems and the control of these resources by the powerful groups of the community threaten the very existence and functioning of wetland and their resources.

Objectives: The awareness and education program was then focused on local communities particularly who depend on the natural resources for their survival and livelihoods. The program is participatory in nature and involves non-formal methods, approaches and tools. The objectives of the program are:

- To create awareness about coastal wetland problems, concerns and issues
- To help in changing attitudes and behaviors of people towards wetland resources.
- To encourage people for their participation not only as a contributor but also as a supporting partners in any development program.
- To make people understand the consumption patterns, production and causes of depletion of natural resources.
- To provide ideas of prevention measures and importance of community participation in the wetland management programs.
- To enhance the understanding of their role in conservation, protection, restoration and improvement of the local environment.

(H)

Approaches: The following informal methods are being practiced as the most convenient ways of imparting knowledge and skills.

- Information sharing groups of children, youth and community people.
- Identification of issues and their prioritization, especially what, how and who.
- Designing and development of communication tools such as posters, banners, video films, slides, booklets, etc.
- Organization of village and group meetings, workshops to share and disseminate information and knowledge through social welfare clubs, mosque and temples.

Major activities are briefly mentioned below.

- Local group discussion: Groups for wetland awareness get together to discuss and share knowledge and concerns with reflections on what needs to be done by the concerned actors with regard to their role and responsibilities.
- **Community workshops:** Each year, a daylong workshop at the community level is organized to share the learning from the awareness program and how they can be used and measured to follow-up in future. In this workshop all groups get together and share with one another their programs, progresses and opportunities .
- Video shows and poster display: Video and posters are shown and displayed. This event takes place in village schools and community centers. The participants include students, teachers, members of local NGOs, local leaders and representatives of the local governments and the general public. After the video show, open discussion is organized to obtain inputs from participants on conducting awareness programs in the community.
- **Celebration of major events:** Rallies are organized on the occasion of wetlands day and environment day. School children as well as community members join the representatives of NGOs and local governments during the day long

event in which discussions, cultural events and debates take place and awareness materials (such as poster, booklets and leaflets) are also distributed.

Lessons and conclusion

Wetland education can give better results if the entire community is targeted as participants in a learning-sharing-doing process. Some lessons learnt from these processes are;

- 1) Sustainability of wetland management practices depends on awareness and education of the values of the wetlands by the local community, users and government.
- 2) A successful education and awareness programs at the local level should include the following factors such as indicators of success, a clear-cut mechanism for monitoring and evaluation, motivation to participants, the sustainability of the program, identification of the target group, a clear-cut objective and the needs of the user group.

Conclusion

Our experiences indicate that an effective method of wetland education is to involve communities in the investigation of the benefits and values of the wetlands. Besides, raising knowledge of the community on ecological, socio-cultural, economic and political relationships is the key for a successful community-based natural resource management, particularly wetland management. Only then will a process evolve through which the sustainable management of wetland resources will occur on the ground.



CAMBODIA

Environmental Law Literacy Program

Y Lavy

Department of Nature Conservation & Protection, The Government of Cambodia

Introduction

Lake Tonle Sap is located at the central region of Cambodia and it is considered as the largest freshwater lake in Southeast Asia. Economic activities of Cambodian people are concentrated around the lake. About 95% of the population living around the lake are fishermen. Lake Tonle Sap is not only important for local economy but also for national economy and culture of Cambodia.

Because of its importance, it is recognized that Tonle Sap should be managed sustainably. But it is difficult to manage without enough resources. Also education and awareness programs play an important role, especially of stakeholders. It is for this reason that local people should be motivated for their participation in the protection and conservation of natural resources of Lake Tonle Sap.

Under financial support from UNESCO, a plan of the integrated management of the Tonle Sap Biosphere Reserve was developed and endorsed by the Ministry of Environment and the Tonle Sap Biosphere Secretariat in collaboration with institutions concerned. This plan is in operation.

Education and environmental awareness of local communities on the importance of wetlands and their resources especially of (H)

Lake Tonle Sap is in place since 1998. The methods and approaches of education and awareness program include;

- Meeting, workshop and training
- Discussion
- Poster and brochure distribution
- Video, TV and Radio
- Questions and answers for school students.

Activities

The Tonle Sap Biosphere Reserve Secretariat (TSBRS) organized three training-workshops at Prek Toal, Anlong Samnor and Peam Bang communes in December 2002 to inform the local people of Cambodian laws and regulations related to fishery, forestry, wildlife, environment and wetlands. The objective of this training-workshop was (1) to disseminate laws and regulations related to fishery, forestry, wildlife and environmental protection to local communities around the area of the Tonle Sap; and (2) to improve the knowledge of the local residents on the importance of wetlands in lake conservation. The royal decree on the establishment and management of the Tonle Sap Biosphere Reserve is considered as the most important topic that needs to be discussed and understood by local communities in the Tonle Sap. Even though the royal decree was issued in April 2001 and many workshops were held for stakeholders in the province about Tonle Sap, most of the local communities around and about the lake had never heard about the decree. It was discussed in the training-workshop and the attention of the local residents was drawn to participate in the livelihood development, sustainable use and conservation program of the Tonle Sap Biosphere Reserve.

During the training-workshop, most of the local fishermen were interested in knowing the mandate of responsible institutions and the values of the Tonle Sap Biosphere Reserve. Local communities were very much concerned about the Reserve. Previously, innumerable institutions worked in their communes for law enforcement and cracking down illegal fishing activities. But all of them tried to get benefit from local fishermen. These institutions never thought about their duty. They often engaged in illegal fishing. And, they implemented law only for poor fishermen. Also, some participants revealed that new fishery law (draft) was stricter than the old ones (Fishery law No 33, issued in 1987) and this law probably requires reviews and revision because some articles were unacceptable for local fishermen.

During the training-workshop participants were divided into 3 groups to discuss three different posters produced jointly by the Tonle Sap Biosphere Reserve Secretariat, Fishery Department and Forestry Department. Some feedback information was received. These topics were, "What do you understand about the poster on (1) the Tonle Sap Bioshere Reserve, (2) Fishery, and (3) Wildlife?"

Most participants urged the TSBR Secretariat to organize this kind of training-workshop at other villages or communes also around the Tonle Sap.

Agenda for the workshop included the general overview of wetlands, environmental protection and laws related to natural resources, protected area laws and royal decrees.

The training-workshop was organized at three different places (1) Buddhist Pagoda in Prek Toal, (2) Meath Khlar village, (3) Peam Bang village. A total of 30 participants representing various strata of the community such as fishermen and fish lot holders, police, soldiers, and commune leaders attended the training-workshop. Activities included on the first day were the overview of Cambodian laws related to fishery, protected areas, wetlands, royal decree, and the Tonle Sap Biosphere Reserve. The second day included group discussion and brainstorming on posters on (1) TSBR and regulations, (2) Fishery and (3) Wildlife. The third day included the video show on traditional methods of sustainable fishery and its impact on resources.

Conclusion

The training-workshop was the first of its kinds in Cambodia. Its objective was to acquaint the local fishermen with basic awareness

of environmental laws. Although the copies of fishery law and regulations were already distributed to local fishermen, the environmental law, forestry laws and Biosphere Reserve concept were completely new to them. In these training-workshops, the copies of all Cambodian laws and regulations relevant to management of the Biosphere Reserve have been distributed to local communities. About 60 % of participants understood these laws but the rest understood vary little because they lacked even general knowledge. These people probably need more and long-term training. However, participants were interested in the training course and requested the organizer to organize this kind of workshops in other communes as well.

The participation of local people is important for the sustainability of long-term management of the core areas as well as the whole Tonle Sap Biosphere Reserve. Furthermore, the participation of the police, military police, soldier and other institutions are important because they control and reduce illegal activities that have destroyed natural resources of the lake. The meeting of all stakeholders was useful and effective for restoration and conservation of the Tonle Sap Lake area.



Ms. Lavy making deliberation on poster education (Photo: M. Takahashi)

CHINA

Protected Area-based Education

Chen Kelin Wetlands International-China

Key words: wetland, education, awareness, community, Lashihai

Abstract: The program of education and awareness aims to improve environmental awareness of local people, managers and decision-makers at the levels of county, township and nature reserve; strengthen capacity of, and improve skills of nature reserve staff in terms of management and conservation of wetlands and their resource; and promote involvement and cooperation of local communities in wetland conservation and management.

During the implementation of the program, some workshops and trainings were organized in Lashihai Nature Reserve, education programs in school and communities were implemented and education materials were also produced and distributed to the target groups and individuals. Such programs have promoted an initial awareness of wetlands and raised concern for their conservation. It is also clear that the attitudes of the people are changing, as some of them are now taking part to protect the Lashihai wetland and the Lashihai Wetland Reserve has set up a local co-management team at the village.

Introduction

The Lashihai High Plateau Wetland Nature Reserve, which is about 8 km away from the Old Town of Dayan (UNESCO World Heritage Site) was established in June 1998, which is located in the center of Lijiang County, Yunnan Province with the longitude of 1000 05' and 1000 13' E and the latitude of 260 44' and 27 0' N. It covers the total area of 6523 ha, which consists of four zones namely Lashihai Lake, Wenhai Lake, Jizi Reservoir and Wenbi Reservoir. It is at an altitude of 2,400 m but its surrounding mountains have elevation ranging from 2,500 to 3,840 m above sea level.

The Reserve is characterized with its unique high plateau wetland ecosystem. The high altitude lakes, reservoirs, forests, shrub lands and meadow are of high productivity and of biodiversity value. Thousands of waterbirds (about 60 species) migrate here for wintering each year and among them there are 3 species of Grade I according to the National List of Protected Wildlife: Black Stork (Ciconia nigra), Black-necked Crane (Grus nigricollis) and Chinese Merganser (Mergus squatus), and 5 species of Grade II. The endemic species of Qinghai-Tibet Plateau are also recorded, including Barheaded Goose (Anser indicus). The water system of the nature reserve connects with Old Town Dayan and agriculture area in Lijiang valley, and provides ecological services to the downstream area. Located in the upper reaches of 3 great rivers: Yangtze River, Lancangjiang River (Mekong River) and the Nujiang River (Salween River). The Lashihai Nature Reserve has a very important environmental significance that may have direct impacts on the eco-environment of China as well as South Asia to some extent.

However, in recent decades, it has confronted with a number of threats; over-exploitation of forest, over-fishing, hunting waterbird, soil erosion and agricultural and chemical pollution and the waste generated by tourists are becoming common, and have resulted in depletion of natural resource and degradation of ecosystem.

In the nature reserve and its surrounding area there are many communities and villages with a large population of more than 31,000 people of 10 ethnic groups. Among them 95% are Naxi people living mostly in the valley area, 4% are Yi people living homogeneously in mountainous area, 1% belong to other ethnic groups. The local economy is mainly agriculture-based, together with secondary occupation in forestry, animal husbandry and fishery. Most people live in poverty. The program of education has addressed the following issues:

- Poor awareness on wetland of local villagers and communities around the Lashihai Wetland Reserve
- Lack of knowledge of management among staff of Lashihai Wetland Reserve
- Over-exploitation of forest and over-fishinng in the Lashihai Wetland Reserve
- Illegal hunting of waterbirds
- Other potential threats such as soil erosion and nature disasters, agricultural chemical pollution and rubbish and waste generated by tourists etc.

Education program

In order to resolve the above problems and threats, a project supported by KNCF Japan focussed on improved environmental awareness of local people, managers and decision-makers to enhance management of the Lashihai High Plateau Wetland Nature Reserve and promote involvement and cooperation of local communities in wetland conservation and management. During the implementation of the program, a co-management group was set up. Workshops and training programs were organized in the Lashihai Nature Reserve, special education programs were carried out in schools and communities and education materials were produced and distributed to the target groups.



Chen Kelin making a point at the presentation (Photo: A. Yonezawa)

Wetland workshop in Lijiang

The participants of the workshop in Lijiang were representatives from the government of Lijiang County, managers of wetland reserves, international experts invited by Wetlands International -China, and local leaders as well. The workshop aimed at learning and sharing of information. Some case studies of wetland management and the methodology on developing management plan were the main topic of the workshop.

Training course for the Reserve staff

A training course for the staff of the Reserve was conducted in Lashihai by Wetlands International-China and Forestry Department of Yunnan Province. The course brought together project staff, provincial technical officers, resource users and NGOs representatives. The training course focused on how to strengthen management capacity of the Lashihai Nature Reserve.

To date this program has generated much enthusiasm amongst the farmers to learn more about wetlands. During the training course, the participants visited the Lashihai Nature Reserve and interviewed local villagers to promote mutual understanding and trust between the Reserve and local communities.

Production of materials

Support materials such as posters, newsletters, brochures and a video were produced and distributed to the general public. Some 1500 copies of poster named "Wetlands-Our Future" were produced and distributed to the local villagers and school students

Environmental education in schools

The middle school No.2 of Lijiang County is located near the Reserve and many students are from the villages surrounding it. Therefore, improved knowledge of students on environmental awareness is a positive influence on villagers. The trained Reserve officers selected teachers of this school as a good foundation for the program. The education activities were undertaken in the school by the staff of the Lashihai Nature Reserve. Through the activities the students became interested in nature protection and took up initiative to participate in protection activities. This program was successful in instilling in students and teachers a sense of importance of the protected area for their community.

The experts from the Yunnan Association of Avifauna gave the lectures at the training course, in which the staff of the Lijiang Nature Reserve also participated. After the training course, four persons were selected as trainers for educating students, to provide training in school. Many students representing each class participated in training. The contents were "Protection of Environment for Waterfowl" and "Identification of Birds". The participants and students had a chance to discuss the theme of "Care for Birds and Protect the Homestead". The participants and students organized bird watching groups on a volunteer basis. Every member of the team mobilized 10 local residents in bird watching. In fact the students played a role of awareness education among local dwellers. The head of Program in Lashihai Nature Reserve together with students prepared birdwatching activities, and the Reserve provided educational materials.

With continuous efforts of the Reserve staff and school students, many officials of the Lashi township government and farmers of surrounding area took part in bird watching activity. During a wrapup meeting, the farmers said that they got useful knowledge on wetland conservation and understood importance of natural conservation of Lashihai Lake. Some farmers said that they used to think water birds were harmful only because they damage and eat away their crops. But now they believe that they are useful as well. Now the hunting of birds has been made illegal. They have now realized that birds are friends of humankind and their protection is beneficial to humankind. The local farmers convened a meeting entitled "Care for Birds and Protect the Homestead". Protection of and care for birds was the major topic of discussion.

As a result the students became active in organizing environmental protection activities and gain new knowledge on birds. The students were direct beneficiaries of the program. They learned about nature protection and understood the importance of environmental protection, and thereby raising public awareness in the community.

Setting up a co-management team of villagers

The staff of the Lashihai Reserve distributed poster "Wetlands -Our Future". They organized the meeting with farmers on "Care for Birds and Protect the Homestead". Also a meeting of villagers was organized in which 26 representatives from 6 villages participated, the results of which are as follows.

1) What benefits have we received from protecting the Lashihai Lake?

Villager's responses were;

- High quality of aquatic products and the living environment
- Aware that they should leave more resources for future generations
- Reputation of Lijiang to attract more tourists to visit this place. This helped to generate more income for local people.
- Some villagers indicated that increased waterbirds would bring more harm to agricultural crops. Birds eat the fish in water pond, particularly in winter. Villagers therefore urged to solve this problem in a quick and effective way.

2) Is it necessary for the local farmers to participate in protection?

Villagers indicated that,

• Lashihai Lake is the place where local people have been living for many generations, therefore, it should be protected well. Their participation is necessary because people should be self-conscious. That is the reason why people have set up village-wide rules and regulations on protection.

- A policy of government "conversion of farmland to forest and lake" has been adopted by the government, therefore villagers should support the government in managing nature reserve.
- 3) Is it necessary to set up a co-management team by villagers? Villagers responded:
 - It is necessary to set up a co-management team, consisting of reserve staff, relevant sectors and village representatives. Through this team villagers can get new information on policy from government, and the Reserve administration can discuss relevant matters with villagers, and a harmony can be developed between the Reserve and communities.
 - Villagers indicated that surrounding villages have different problems, because they have different economic situations. A co-management committee of big size would not be appropriate, because it would be too large to reach consensus on the issue. The villagers also suggested to set up a relatively small comanagement team representing only the selected pilot villages. Then it would be easier for members to accumulate experiences on how to deal with the issue effectively.

4) What should be the duties and responsibilities of comanagement?

Villagers indicated that co-management team should consider the constraints of both the Reserve and communities. The following is the mandate of the team:

• Nature Reserve provides assistance to farmers in getting knowledge of new methods of wetland conservation, which may help improve agricultural and aquatic farmings.

- Nature Reserve should help villagers get economic support from the state and local government.
- Nature Reserve should not allow outsiders to develop tourism in Lashihai, because outsiders are always concerned with economic benefits and ignore local needs. From this reason, tourism and development activities should consider the active involvement and participation of local people.
- The representatives of villages should communicate the message to farmers and prevent negative actions.
- The co-management team should help village formulate its rules and involve more farmers in raising awareness.
- 5) How can we identify a pilot village for co-management? The villagers said that the following criteria should be used.
 - A minimum population
 - Existence of obvious conflicts with Nature Reserve
 - Clear targets of co-management
 - Strong willingness of villagers for having co-management team.

The findings of the meeting of the Lashihai Nature Reserve ushered them to set up a co-management team consisting of (1) 4 members from village, (2) 1 member from the Lashi Township Government, (3) 1 member from the Women Federation, (4) 1 member from deputy director of the Forestry Bureau of Lijiang County, and (5) 4 members from staff of the Reserve

During a meeting of the co-management team a work plan for next stage was developed. The time from the end of September through October is a busy time for autumn harvest, so two activities were arranged in the middle of November and December. They were;

• To collaborate, with assistance of agricultural technicians, in activities such as fruit cultivation and breeding.

• To continue discussion on topics such as lifestyle through adoption of other alternative lifestyles, wise use of aquatic life and so forth.

Results of the program

The environmental education programs conducted by the Lashihai Wetland Nature Reserve made a number of changes in the communities such as increase in the motivation of people in the protection of the Lashihai wetland and strengthening their understanding of the relationship between nature conservation and their perceived needs. Some of the results of this program are described below.

- Lashihai Nature Reserve was approved by Yuannan Provincial Government as the first provincial wetland reserve. Lijiang County prepared and issued the regulation concerning the protection of the nature reserve. Some monitoring and management stations have also been set up.
- The Program has popularized the modern agricultural techniques and supported economic development at the local level. The local communities are encouraged to use saving energy stoves and biogas ponds, which can reduce the consumption of fuel wood.
- Local communities have changed their attitudes towards wetlands. For example, in Wenhai Village, the villagers organized a community cooperative foundation to conduct eco-tourism, which is a practical way to protect wetlands resources and at the same time to increase their income. The foundation also conducted some kinds of public awareness activities. Now these activities are in operation and showing good results. With the improvement of local community awareness, villagers are active in participation in the resources management and protection.
- Local schools have integrated environmental education into their courses. These schools organize different activities on Wetlands Day for school children each year.

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INDIA

Community-based Education

Durga Prasad Dash

Pallishree

Chilika, a Ramsar site of India, is a unique wetland with estuarine characters and an assemblage of marine, brackish and freshwater eco-system. It is a hotspot of biodiversity and shelters a number of endangered species listed in the IUCN red list of threatened species. The lagoon is an avian grandeur and the wintering ground for more than one million migratory birds.

It is the largest brackish water lagoon in Asia having a vast and dream-like expanse with a surface area of over 1,000 square kilometers. Unfortunately, the commercial exploitation of the lagoon and its natural resources has been a primary concern over the past few decades and has led to serious ecological and social impairments such as siltation, deterioration of water quality resulting in loss of bio diversity and wetland productivity, poaching of juveniles (fish, prawns, crabs), poaching of birds, threat to the rare *Irrawady* dolphins, wasteful use of freshwater resources, silting up of wetland due to inappropriate land use and unsustainable agricultural practices.

PALLISHREE, a grassroots level NGO is implementing Environmental Education and Awareness Project for the stakeholders of Chilika Lagoon since last two and a half years with the financial support of Japan Fund for Global Environment (JFGE), Japan and technical support of Ramsar Center Japan and the Chillika Development Authority (CDA), India. The overall goal of the Project is environmental awareness and education amongst the stakeholders of the lagoon with focus on biodiversity conservation and wiseuse. The focal point and nucleus of the entire program is CEAE (Center for Environmental Awareness and Education). On the basis of the rich experience of the village schoolteachers and the suggestions from the International Experts Meeting at Chilika, the following activities are implemented through CEAE.

- 1. CEAE was established one each in 10 schools at the strategic places within two cluster areas consisting of 40 villages. The community provides a room in each school for the center, each serving a combined population of over three thousand. Through these centers many environmental posters, audiovisual materials and musical instruments have been collected for each school. These centers form a good platform for exchange of ideas and thereby enhancing the implementation of sustainable practices.
- 2. A three-pronged approach to environmental education formal, non-formal and informal is adopted in the center.
 - The formal education methods include resource packets such as a school textbook titled *Environment of Chilika Lagoon* printed in the local Oriya language. *The Green Action Guide* has been translated into the Oriya language and distributed to schools.
 - The non-formal method encompasses trained facilitators who serve in resource centers. The resource center serves as information repository. At present, educated and environmentally literate people often visit the Centers.
 - The *informal* method is truly participatory in nature and has been employed to ensure broad community participation. It is effective precisely because it successfully incorporates local folk traditions such as drama and dance. An example of this is the use of *daskathia*, a local performance art that incorporates the use of colorful costumes and special sticks while expressing important

themes through song, dance and music. The major themes covers; the root-causes of environmental degradation, the importance of conservation measures and wise use practices. Some advantages of the informal method in environmental education are:

- Covering information on local problems and their solutions
- Entertainment as a way to transmit information
- Use of local language, terminology, folk arts, etc.
- Active participation of local performers and directors
- Creative use of dialogue to ensure audience interest in conservation
- Reaches a larger target audience, including women
- Leaves a lasting impression on the target audience
- 3. Each center collects materials and displays them in the library. They are meant for enhancing the knowledge of the stakeholders. These materials include skeleton of the reptiles, small fish aquarium, birds and aquatic animals of Chilika, environmental books, posters, leaflets, kit, natural resources of the lagoon, the handicraft materials manufactured by the stakeholders using the raw materials of Chilika Lagoon, play materials, audiovisual materials, musical instruments, materials used for socio-cultural activities and cassette containing the twittering sound of different birds.
- 4 Street theatre, socio-cultural programme, audio-visual demonstration etc. is organized in every village every year to refresh their awareness and education on the environment.

The facilitators also organize meetings for the local women to make them aware of their rights, problems of the wise use and good practices of the lagoon, etc. There had been some activities done in the past few years to bring attitudinal changes in the mindset of people. These activities are: **Publication of newsletter:** A quarterly newsletter in local language namely the *Mirror Of Chilika* has been published for local schools, women groups, youth leaders, natural leaders and government officials. The materials for the newsletter have been collected from the students, teachers, local youths, women group and NGO of the target area.

Street theater: *Daskathia* is a form of the local traditional street play with song, dance and a pair of stick to produce a rattling sound. The performers use colorful dress to attract the crowd. It is amusing, interesting, exciting and at the same time educative. This tool is used to communicate the messages of environmental education blended with entertainment to the audience. The advantage of this street play is that it can be performed at any public place and does not need any stage arrangement. The script of this street play is modified to cover the root-cause of the degradation of the lagoon, conservation measures, education on lagoon environment and its wise use. It is organized by the CEAEs to make the people aware of lagoon and its resources.

Cultural functions: Every year during the November full moon, Orissans traditionally celebrate a boat sailing festival. This festival includes the worshiping of boats and commemorates the sailing power of those sailors who brought prosperity to these shores by braving the open seas. Over the course of ages, people forgot this valuable culture and the observance of this festival declined. CEAE has successfully revived this observance in the project area with an aim to promote the cultural aspects of wetlands as a tool to ensure their conservation and management. In this festival, a boat is decorated and worshiped with offerings. Then, the local folk play is shown by local youth from the boat and the boat is taken around the island villages.

Nature camp: The objective of the nature camp is to organize an exposure visit of a batch of children along with teachers, facilitators

and team leaders. Regional Science Center, planetariums, historical hills, State Museum, Zoo and Botanical Garden are the places where the team camps to enhance the knowledge on nature about animals, plants, hills ecosystem, historical monuments and land ecology.

Wall paintings: Wall paintings have also played a major role in raising local awareness. From outreach experiences, the wall paintings are found to be very powerful tools of communication, which attract the attention of people on the sensitive issues of Chilika's environment. The thrust is given on the visuals as the colorful painting with very small and catchy slogans. Specific themes depicting the lagoon environment have been painted at prominent and strategic places in island villages.

Nature trail: The objective of this programme is to provide facilities to the local students, stakeholders, tourist and visitors to sit on a place and enjoy the view of the lagoon, the eco-system and its scenery. Under this nature trail programme, the plantation of coconut plants, stump of banyan trees and lily plants have been done and fixed benches have been constructed from Satapada village to Alupatna village along the bank of the Lagoon.

Boat Rally: The CEAE with the community celebrates the boat rally and the villagers arre encouraged to take the lead part in boat rally with a massage of conservation of bio-diversity, eco-system, and wise use of the lagoon resources. The theme of the rally is *"Save Chilika"*.

Observation of WWD: World Wetlands Day (WWD) is being celebrated every year on 2nd February and it is an opportunity to enlighten the local community about the importance of biodiversity as well as the value and functions of wetlands. A large number of people take part in the boat rally with banners espousing biodiversity conservation, ecosystem management, pollution control and good practices for the lagoon.
Conclusion

With so many activities being carried out in the past few years on a regular basis a dramatic change in the attitude of the people has been noticed. The community has been very receptive and given a good support to the NGO. They have been responsive to actions taken by the NGO by helping them in collecting the resources and disseminating them. The following changes have been noticed in the villages.

- Reduction in the use of small mesh size nets in target villages.
- Significant reduction in poaching of prawn juveniles
- Release of smaller sized fish, prawn & crab for the future
- Stakeholders are lobbying the government to plant trees on lagoon embankments
- Decision on the implementation of wise use practices
- Formation of *Bird Protection Sangh* and a significant reduction of poaching of birds in the Lagoon.
- Reduction in the use of chemical fertilizer and pesticides at agricultural fields around the Lagoon.
- Empowerment of women of the fishermen community in organizing meetings on environmental education and conservation.

Peer Education in a Ramsar Site

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Indian Environmental Society

ABSTRACT: Wetlands are complex hydrological and bio- geochemical systems, endowed with specific structural and functional attributes and performing major ecological role in the biosphere. The conservation of wetlands is desired not only for their scientific, economic, aesthetic values but also for ethical reasons. India has gradually progressed in taking up various initiatives and measures for the conservation of its important wetland areas covering about an area of about 5.5 million ha throughout the country. As the local communities around the wetlands are almost entirely dependent on the natural resources from their immediate environment they should be educated about the sustainable use and conservation of wetlands. Thus in addition to the conservation measures there is a need of educating children as well through their medium the whole communities especially around the wetlands. The Indian Environmental Society has experimented in this direction through initiation of mass awareness and education programs in the Keoladeo Ghana National Park, (Bharatpur), a World Heritage Site.

Introduction

Wetlands are lands where saturation with water is the dominant factor determining the nature of soil development and the types of plant and animal communities living in the soil and its surface. The most important feature of wetlands is at least periodically covering of the substrata with water. The plants and animals, which are, adapted for life in water or in saturated soil, can only thrive well in such situations. Wetlands are lands transitional between terrestrial and deepwater habitats and in a wetland either water table is at or near the surface or the land is covered by shallow water. (Cowardin et.al., 1979). Peicsymaska (1972) is of the opinion, that wetland is a "store" of accumulated matter of terrestrial and aquatic origin. According to them wetlands must have one or more of the following attributes: (i) the substrate is predominantly undrained hydric soil, (ii) at least periodically the land supports predominantly hydrophytes (iii) the substrate is non-soil and saturated with water or covered by shallow water at some time during the growing year.

Ecologically wetlands may be viewed as complex hydrological and bio-geochemical systems, endowed with specific structural and functional attributes and performing major ecological role in the biosphere. The studies have demonstrated that the wetlands are among the most productive ecosystems (Leith and Whittaker, 1975). They are life support systems for people living around and are effective in flood control, wastewater treatment, reducing sediment, recharging of aquifers and also hibernation and breeding ground for variety of birds, fish and other flora and fauna. They also act as buffer against the devastating effect of hurricanes and cyclones, stabilize the shoreline and act as bulwark against the encroachment by the sea and check soil erosion. Apart from that, they are valuable for their educational and scientific interest and provide durable timber, fuelwood, protein rich fodder for cattle, edible fruits, vegetables and traditional medicines.

Thus, the conservation of wetlands is desired not only for their scientific, economic, aesthetic values but also for ethical reasons. Scientifically, the wetlands are interesting ecosystems important for education and research; they are reserves of rare species, high diversity and important gene pools. Aesthetically, the wetlands are important recreational areas for their avian fauna, fish and sightseeing. Economically, proper management can yield valuable products including food from the wetlands. Lastly, it is ethically necessary to protect the rare biota from destruction and leave a rich heritage for coming generations.

Distribution of wetlands

Wetlands occur in areas where precipitation exceeds the potential evapotranspiration leaving accumulated water surplus. Climatically about one-third of Indian subcontinent falls under this category and wetlands are thus common throughout specially, in Jammu and Kashmir, Uttar Pradesh, Bihar, West Bengal, Orissa, Assam, Eastern Madhya Pradesh, North Eastern Andhra Pradesh, and east and west coastal regions.

The variability of climatic and topographic patterns has bestowed India with a large variety of wetland eco-systems throughout the country ranging from Ladakh through West Imphal, warm arid zone of Rajasthan, tropical monsoonic Central India to wet and humid zone of southern pennisula.

In India wetlands cover an area of about 5.5 million ha, of which 1.5 million ha enjoy complete protection and 1.6 million ha partial protection. India being a developing country supporting the second largest population in the world, having mainly agrarian economy has a significant impact on all natural resources including that of wetlands. It is in this context, an inventory of the important wetlands is essential. The directory of Asian Wetlands (1989) lists 93 Wetlands of International importance in India. Indian wetlands have not been comprehensively surveyed. There are therefore varying estimates of the total extent of wetland resources in the country. A Directory of Asian Wetlands (IUCN, 1989) presents the estimates in Table 1.



Prof. Bandhu making his presentation. (Photo: M. Takahashi)

Wetland conservation in India

The studies on wetlands in India are relatively recent and very little is known about their distribution, structure and function, ecological status and management needs. The International Conference on Wetlands held at New Delhi in 1980 brought to focus the great paucity of information on tropical wetlands and emphasized an immediate need of their ecological surveys and detailed investigations.

Considering the extent of degradation of wetlands, Wetland Conservation Program has been operational since 1987 with the basic objective of assessment of wetland resources, identification and implementation of management action plans of the identified wetlands, to involve people in management of wetlands in the country which are at present 20 covering 13 states (MoEF, 2001-02). For the sustainability of the programme, many significant initiatives have been undertaken within the Ninth Plan Period which includes preparation of management action plans for identified areas supporting conservation activities like survey and demarcation, catchment area treatment, desiltation, weed control, fisheries development, community participation, water management, public awareness, pollution abatement etc. The National Committee on Wetlands, Mangroves and Coral Reefs was constituted in 1992 and identified sixteen wetlands in the year for implementing programmes of conservation, management and research on wetlands. The programme so far has now prepared management action plans for 19 wetlands (from 11 wetlands in 1992) for intensive conservation and management. India as a signatory to the Convention on Wetlands of International importance especially as Waterfowl Habitat generally referred to as "Ramsar Convention" designated Chilka (Orissa), Keoladeo Ghana National Park (Rajasthan), Harike (Punjab), Loktak (Manipur), Sambhar (Rajasthan), Wular (J&K) as watersheds under this convention (MoEF, 1992-93). These research projects are being carried out under formulated guidelines for their implementation as well as monitoring mechanisms, which have been provided to concerned State Governments for execution after review of activities. 100% central assistance is being given to the

concerned state governments under National Wetland Conservation Program for activities like survey and demarcation, mapping, landscape planning, hydrology, control of encroachment eutrophication abatement, aquatic weed control, wildlife conservation, fisheries development, research and environmental awareness in function of aquatic ecosystems.

WATER RESOURCES	AREA (MILLION HA)
Area under paddy cultivation	40.9
Area suitable for fish culture	3.6
Area under capture fisheries (brackish and freshwater)	2.9
Mangroves	0.4
Backwaters	3.5
Man-made impoundment	3.0
Rivers, including main tributaries	(28,000km)
Canals and irrigation channels	(113,000 km)
Total area of wetlands (excluding rivers)	58.2

Table 1: Estimates of total extent of wetland resources in the country

The Ministry of Environment and Forests, Government of India (1990), estimates that India has about 4.1 million ha of wetlands (excluding paddy fields and mangroves) of which 1.5 million ha are natural and 2.6 million ha man- made. Mangroves are estimated to cover 0.6 million ha.

Another project of wetland mapping is being carried out with the assistance of UNDP to map wetlands less than 56 hectares. Mapping of wetlands will provide an important source of the primary data about wetlands under the project. This project is being executed through Salim Ali Centre for Ornithology and Natural History (SACON). The results of this project have enabled identification of four wetlands, which need immediate action for their conservation. For the purpose another PDF-B project has been specified.

Loktak Lake is yet another important wetland for waterfowls, a technical committee has been constituted to coordinate the activities pertaining to the lake. Apart from this, first phase of project on economic evaluation of Harike Wetland in Punjab has been completed. These projects have little scope of involvement of the local people to their design, however any plan under the wetland conservation program has identified the need of educating people and has therefore included the projects to carry out training programmes/ workshops for various wetland programs for senior managers as well as their local stakeholders in different parts of the country. The Government of India has also shown interest in increasing the traditional knowledge of people intimately associated with the water bodies and to assess the efficiency of adopted strategies in relation to the traditional technology adopted by the local people. To justify the emphasis on the education of the local people a case study has been discussed in the following account.

Case study at Keoladeo National Park

Awareness and education among school children about natural resources at Keoladeo Ghana National Park, Bharatpur.

Significance: Keoladeo National Park is situated in Western · India at the confluence of the Gabhir and Banganga River, 170 km , south of Delhi in Bharatpur district in the state of Rajasthan. (270 13', 77 o 32'E). The park is spread over an area of about 2873 ha; about 1000 ha inundated. The park assumes significance due to its strategic location, as it is a staging ground for about more than * 350 species of migratory waterfowl arriving from various regions. · The park is the only regular wintering area in India, which is visited by rare and endangered Siberian Crane. The habitats of the Park range from upland terrestrial to submerged aquatic system. * The Park was designated as a Wetland of International Importance · (Ramsar Site) under the Ramsar Convention in 1991 and a world heritage site in 1985 by UNESCO. The park supports an amazing variety of plants and animal species. The vegetation of the area covers about 375 species of angiosperm including dominant trees · (kadam), herbs (55% of the floristic species) and grasses (most wide spread khus grass). Fauna of the area can boast of invertebrate fauna (tortoise, beetle etc.), fish (40 species), amphibians (7 species), reptiles (13 species), birds (350 species), mammals (27

species). The wetland is also rich in microscopic life forms such as algae, fungi and zooplankton, which change with the seasons and varying eco-climatic conditions.

Problems of the area: The Park is under pressure as there is no buffer zone. Twenty villages are spread over an area of 4412.06 hactares, which surround the National Park and are posing a threat to the overall ecological balance of the wetland. Some of the important problems include those of lack of water (in dry years), inequitable water distribution, lack of local participation in resource management, weed invasion, overgrazing of grasslands, employing disabled cattle, lack of fodder, poaching and poisoning of protected species.

The project and its activities: In the recent years, like all other large areas of natural wetlands in different parts of the world, Keoladeo National Park is also under imminent danger of extinction because of human interference. The Indian Environmental Society in association with Ramsar Center – Japan launched a project on "Community Participation to protect and Conserve the National Park". Activities of the project included:

- Organization of environmental awareness camps aiming at generating favorable attitude for natural resource conservation among children and community groups.
- Environmental rallies to draw local people's participation in sustainable utilization of resources and management of the wetland.
- Poster competitions and flower show as complementary to the Natural Resource Conservation Program.
- Distribution of pertinent resource materials on wetland and biodiversity conservation among school children
- Composting and plantation activity in schools
- Promoting school children volunteering to clean up their school.
- Encouraging villagers to plant trees to increase greenery around the National Park.

Results and conclusion: The study has proven the importance of people oriented conservation measures and approaches to sustain those practices for a lifetime through the local community itself. The project has helped local people to identify their own problems and then taking appropriate measures to combat those problems has consequently led to improvement of the environment of the wetland. Villagers have now started playing a dual role of consumer as well as conservators of the natural resources of the wetland.

The villagers are the stakeholders of the wetland and therefore play an important role in the success of the conservation measures taken up by the government for its preservation and protection. The school children and teachers hold a key status in village community and play a vital role as disseminators, mediators, and opinion makers and tend to influence to a large extent the attitude and behaviour of the community. Considering their position and role, this experimental project was carried out to involve them as the peer educators for environmental education and awareness building. Therefore, such programs should be encouraged in other wetland areas of India as well as other communities dependent on their local natural resources to ensure the success and sustainability of the conservation measures through coordination of efforts at the central, state and local levels.

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INDONESIA

Challenges of Wetland Education

Nyoman N. Suryadiputra

Wetlands International - Indonesia Programme

Introduction

Wetlands International-Indonesia Programme, WI-IP, (formerly known as AWB, Asian Wetland Bureau) has existed in Indonesia since 1987 by the invitation of the Directorate General of Forest Protection and Nature Conservation (PHKA) of the Ministry of Forestry. During its early presence in Indonesia up to the early 1990s WI-IP's activity was mainly focused on wetlands surveys, but since then its activity has broadened towards awareness/environmental education and community development programme activities. Since that time about 40 wetland sites in Indonesia have been surveyed and the data obtained from the surveys have been installed into a database which now accommodates information from about 280 important wetland sites from all over Indonesia. This information data is derived not only from the surveys that have been carried out by WI-IP but also from other sources.

From the many surveys carried out at different locations in Indonesia, WI-IP realized that the wetlands ecosystem in many parts of Indonesia has been degraded and threatened by human activity due to the community's lack of understanding concerning the role of wetlands ecosystems. The community does not realize what benefits and functions is provided by wetlands. This situation prompted WI-IP in the early 1990s to start developing a number of environmental education/awareness materials such as announcement boards, leaflets, booklets, posters, comics, magazines, newsletters, guidebooks, etc. that can be widely used by people of different ages and at different locations.

Types of materials

Basically the awareness and environmental education materials produced by WI-IP can be classified into three groups, according to their nature.

Site specific issues

This type of materials generally refers to issues concerning environmental conditions and/or species of flora/fauna in a particular area (e.g. National Park, White-winged Wood Duck habitat, etc.) so that the materials will be appropriate for use in those areas, and they are presented to people of particular age groups and in particular places (e.g in schools, public gathering places, etc). Such materials are usually produced in limited quantities. Examples include environmental education materials for primary school children in Gunung Halimun National Park West Java, Selamatkan Mentok Rimba (Save the Whitewinged Wood Duck) posters in Sumatera, environmental education materials for primary schools in the vicinity of Danau Sentarum-National Park in West Kalimantan, a simple guidebook to identify pond and stream invertebrates for the determination of water quality, a guidebook to identify medicinal plants, and a mangrove guidebook.

General issues

These materials are general in character, aiming at a very wide target audience (irrespective of age or educational background) and can be used over a wide area. Such materials are usually printed in large quantities and frequently reprinted. Examples produced by WI-IP include the posters Manfaat Lahan Basah (Benefits of Wetlands) and Selamatkan Hutan Mangrove (Save the Mangrove Forests), and the comic Selamatkan Hutan Masa Depan Kita (Save Our Future Forests).

Mixed issues

These materials are a mixture of site specific and general issues which may be of a local, regional or even global character. They cover issues concerning conservation, management and policy in the field of environment. Their target is the wider community throughout Indonesia, including decision and policy makers in various government institutions, Parks' Management Units, NGOs, universities, the private sector, secondary schools, etc. One example is the magazine Warta Konservasi Lahan Basah/Indonesia's Wetlands News Letter issued quarterly.

Constraints

WI-IP has experienced the following constraints in carrying out its educational programmes and public environmental awareness campaigns:

- The materials described above can usually be produced only when there is a sponsor, or to convey the message of a particular Project, with the result that the materials produced are very specific in nature and do not address the broad, complex environmental problems of Indonesia.
- However good the awareness materials are, the effort to produce them has been wasted if the community does not have the commitment to apply them in their daily lives. The most common response is "How can we care about the environment (e.g. not cutting down trees in conservation areas) when our families are going hungry?"
- A particular problem with some site specific materials (e.g. environmental education in primary schools) is that they cannot always be integrated into the local curriculum, but are presented more on an ad hoc basis. Even when they are integrated, they are usually slipped into an existing subject class such as biology. Thus environmental awareness is not presented as a subject in its own right.
- The continuity in the use of these materials for the environmental education/ awareness campaign and the number of materials printed are both restricted by the availability of funds

(finance from sponsors is usually limited). Generally, when the project is over and all the materials printed have been used, the programme it was intended to support will also cease.

- Many of the materials for environmental education and • awareness campaign programmes in conservation areas do not reach the appropriate target. This happens because the target audience live in remote locations, have a very low educational background, frequently move, etc. For example, the issue of peatland forest fires in Sumatera and Kalimantan has attracted the attention of donors from many countries, such as JICA-Japan, European Union (EU), GTZ-Germany, etc. to prepare educational materials and undertake an environmental awareness campaign on the dangers of fire in peat lands and forests. These have been presented jointly by the National Park staff and other related institutions through extension programmes, but in reality the campaign activities have not reached all of the intended target community. This is because those people who actually do the burning are both difficult to identify and difficult to reach.
- There is no monitoring of the use of these materials once the project is finished. Generally, we do not know whether the materials which have been distributed to the schools and community continue to be used or not.
- There has been no evaluation as to whether the environmental education and awareness campaign activities have had a positive impact in changing the communities' attitudes and perception regarding the environment around them.

Conclusion

All environmental education programmes and awareness campaigns will produce only limited, unsustainable results if they are only carried out during the period of a particular project. Therefore, we must seriously consider how to include environmental education into the local curriculum, using site-specific materials as described above.

Asian Wetlands Week and Children¹

Reiko Nakamura

Secretary General, Ramsar Center Japan

The Ramsar Center Japan (RCJ) is a non-governmental organization established in 1990, in Tokyo, Japan. It aims to promote the wise use of wetland and its resources and foster the mission of the Convention on Wetlands (Ramsar Convention) in Asian countries. Presently it consists of 120 individual members who voluntarily pay membership fees annually. They are mostly university professors, scientists, journalists, government officials, NGO activists, housewives and students from Japan and other Asian countries such as Malaysia, Indonesia, Bangladesh, India, Nepal, Philippines, Thailand, Australia, Taiwan, China and Korea.

The objectives of RCJ are to enhance public awareness on conservation and wise use of wetlands, to ensure local people's participation in wetland management, and to implement the above two objectives through networking and partnerships among the sectors related to wetlands. It promotes research and data collection on wetlands, in particular, inter-linkage between people and wetlands, and provides information and resource materials for education and public awareness as newsletters, booklets, website, videos and so forth. A number of international workshops and

¹ After the presentation of this paper, Asian Wetlands Week (2-8 February) was observed with varieties of programs to appreciate the wonders of wetlands in the region. The wetlands week was remarkably successful. For detail activities, please visit the website mentioned in the 8th paragraph— The Editors.

symposiums related to wetlands have already been organized by RCJ in collaboration with its Asian partners in the region.

Two meetings of Asian Wetland Symposium in 1992 and 2001 as well as a number of regional workshops such as "Editorial Meeting of the Asian Biodiversity and Wetlands" (1994, Indonesia), "Regional Workshop on Public Awareness of Biodiversity in Wetland"(1994, Thailand), "Wetland Conservation and Management :The Role of Research and Education in Enhancing Public Awareness"(1998, Malaysia), "Wetlands, Awareness, Local People and the Ramsar Convention in the Mekong River Basin"(1999, Cambodia), and "Wetland Conservation and Need for International Cooperation in the Northeast Asia"(2002, Korea) are some of the major achievements of RCJ in its 13 year long journey.

There are many publications produced by RCJ such as "Guide to Wetlands in Japan"(1990), "The Narashino Statement/Guiding Principles for Development of Public Awareness of Biodiversity in Wetlands to Ensure the Participation of Local People and Community in Their Wise Use" in 15 languages(1996), "Peoples and Wetlands in Japan"(1999), "The Penang Statement" in 19 languages(2002), as well as educational videos "Wet Wonderland"(1996) and "Coral Wonderland"(1998).

Since this year 2003, RCJ initiates the new wetland awareness campaign called "Asian Wetlands Week (AWW). The theme of the campaign is "Wetlands Love Children" with the financial support from the Japan Fund for Global Environment of the Japan Environment Corporation. As every body is aware of the fact that February 2 is the World Wetlands Day and is celebrated all over the world to promote the cause of wetland conservation and wise use. We at the Ramsar Center Japan have decided the week from February 2nd to 8th as the "Asian Wetlands Week", and encourages every organizations and individuals in Asia to plan and conduct a project or activity for the purpose of promoting conservation and wise use of wetlands in their own fields. The mission of "Asian Wetlands Week" is to raise awareness and appreciation toward wetlands all over the Asian continent. In this year, we are focusing on the participation of children, who will be going to shoulder our globe in the future. Our slogan for this campaign is "Wetlands love children, children love wetlands". As you can see from this slogan, we welcome events and projects that encourage the participation of children in any kinds of wetland conservation and wise us activities. Already participations, both organizations and individuals, from Thailand, Indonesia, India, Nepal, Philippines, Bangladesh, Korea, China, Taiwan have been taking active initiatives. In Japan, the RCJ Secretariat will hold a forerunning event of "Japan/China/Korea Jointl Event on Asian Wetlands Week Celebration" in the Yatsuhigata Ramsar site, Narashino, on 18 -19 January 2003 inviting children from China and Korea to Japan. It would be the first remarkable forum on wetland conservation among children from those 3 important countries of Northeast Asia.

We prepared an AWW poster and an AWW sticker as campaign tools. In order to save the cost for printing and posting hundreds of copies, we put the poster design on the RCJ website < http:// homepage1.nifty.com/rcj/>. It can be downloaded and printed by anybody. The AWW sticker was prepared to present to children who participate in the AWW events on wetlands. Anybody or any organization who make original plan of activities for AWW and send the campaign activities by sending contents of the event to RCJ will be sent the stickers up to twenty copies for free on a first-come bases. One can get further information on AWW from the RCJ website.

To make this AWW campaign successful, it needs a lot of participants from all over the Asia. RCJ calls upon all the participants of this workshop to join the event. Please join the initiative and make it successful.

Thank you





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MALAYASIA

Wetland Education Kit

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Introduction

Wetland education is seen as a tool for promoting new perceptions to guide new patterns of behavior between mankind and the environment (especially wetlands) and between individuals in any society.

What are the objectives of wetland education?

- Generate a greater awareness among people about the functions, services and values of wetlands so that they are perceived as important assets of the natural infrastructure of each country.
- Motivate people to care about wetlands so that they become involved in policy formulation and hands-on planning and management of wetlands. This is the key to encouraging desired behaviour that impact positively on wetlands and lead to the sustainable use of the resource.
- Build support for wetland conservation and wise use amongst policy makers, the private sector and all sectors of society – the Ramsar Convention's constituency.

Tasek Bera Ramsar Site

Tasek Bera is an alluvial riparian swamp system situated in the catchment of the River Pahang, which comprises swamp forest (90%), Pandanus- Lepironia swamp and open water (1%) with beds of submerged macrophytes. It is a monsoonal wetland system, subject to fluctuations in water levels of up to 5 m, which occur in response to local rainfall patterns. The peat swamp forests of Tasek Bera are floristically and structurally unique while the mosaic of wetland habitats contains plant species of conservation interest, and together with adjacent rainforest support a rich diversity of animal life, including globally threatened and endemic species. Some 2000 indigenous Semelai people live in and around the Ramsar site, depending to a limited extent upon its resources, and eco-tourism is being promoted as one of the important uses of the site. These indigenous people have lived in Tasek Bera wetlands since 600 years ago.

Tasek Bera became a Ramsar site in February 1995 and a 3-year project was initiated in June 1996 to provide support for the implementation of obligations under the Ramsar Convention, specifically on the integrated management of Tasek Bera. The Project was financed by DANCED, Danish Co-operation for Environment and Development, and implemented by the Pahang State Government with technical assistance from Wetlands International.

The Project aimed to conserve and enhance the biodiversity of Tasek Bera and its catchment, and ensure the wise use of its wetland resources. The main objectives were (1) to establish a protected area at Tasek Bera with a management plan and management authority; (2) to integrate local communities into site management activities, tourism services and socio-economic development; (3) to produce a nature-based tourism development plan for Tasek Bera; (4) to develop a visitor centre cum field study centre; (5) to carry out an environmental education and public awareness program; and (6) to provide training for reserve staff, tourist guides and managers.

The Tasek Bera Wetland Education Kit was developed as one of the main outputs of the environmental and public awareness program component under the large project.

Why was the wetland education Kit developed?

The kit was developed because it was seen as integral to the management of the Ramsar site and also, such an educational initiative was made reference to in the Training, Education and Public Awareness component of the Integrated Management Plan of the Tasek Bera Ramsar Site.

The Training, Education and Public Awareness component of the Integrated Management of Tasek Bera Project has employed a three-pronged approach towards increased awareness for better decision-making in wetland conservation and utilisation.

Through its Training Programme, it aims to provide the main stakeholders with the necessary skills and knowledge to manage the Tasek Bera Ramsar site sustainably and use its resources wisely. This means it will provide technical training for professional staff involved in the management of the site and skill training for those, like the Semelai, using resources at the site.

In addition, the Education Programme focuses on increasing the awareness of wetland values and benefits among primary and secondary school students in the Bera district and concentrating its efforts on producing a better-informed group of future decisionmakers. The Public Awareness Programme, on the other hand, aims to increase awareness among the general public, especially among visitors to Tasek Bera, of the importance of wetlands, wise use practices and threats to wetlands. It also implements general conservation education among the Semelai to raise awareness in the local community of the importance of protecting Tasek Bera for their future.

How was the wetland education kit developed?

The Bera District Education Office, Pahang worked in close collaboration with lecturers from a local Teachers' Training College in Kuantan, Pahang in developing the wetland education kit on Tasek Bera. An Education Committee was set up to look into the detailed development of the contents of the Kit. This Committee was made up of the Bera District Education officer, the principal and the head of department of Social Studies at the Tengku Ampuan Afzan Teachers' Training College, a staff member from the Department of the Educational Knowledge at the College and 2 education officers from Wetlands International – Malaysia. The committee members had vast experience in drawing up and developing modules for students as well guide books for teachers. This was one of the reasons that the end product was informative, useful and fun for children to do. It had elements of being a very visual and highly informative learning tool for wetland conservation. Many preliminary meetings and discussions were held in order to come up with a framework for the education Kit. Most importantly, consensus was obtained from the members of the committee that the education output be in two languages i.e. the English Language and the National language of Malaysia which is Bahasa Malaysia; contents be fun filled and easy to understand; and target audience be 12-15 year olds.

The main components of the Kit was:

- A colourful poster 2m by 3m on fish of Tasek Bera
- A colourful poster depicting the many varied habitats in Tasek Bera
- A 20 minute video presentation in VHS format of the interesting flora and fauna of Tasek Bera and accompanied by an activity sheet
- A cassette containing recorded sounds of birds, insects, frogs and mammals living in Tasek Bera wetlands
- 5 Learning Modules for students with work sheets
- A teachers guide to the learning modules
- A short illustrated story entitled "Expedition to Tasek Bera"
- A board game of snakes and ladders type with 'Help Conserve Tasek Bera Wetlands' as a background theme.

How was the Kit used?

The Kit was completed after 18 months of hard work and input from all the team members and the CEPA officer at Wetlands International – Malaysia office was the chief editor. Along the way many suggestions were given until the final package to contain the various elements of the Kit took the shape of a MacDonald like 'happy meal box', which could be carried to the field and into the classroom easily.

As a pilot testing of the effectiveness of the Kit – it was used in 5 schools in and around Bera district, which is about 20-30 km radius of the Tasek Bera Ramsar site. These selected schools had audio-

visual facilities and showed a keen interest to use the Kit as an informal way to teach nature studies. The responses and feedback obtained from the teachers and students was very encouraging.

In total, 450 sets of the Kit were printed under the DANCED funded project. About 250 Kits were disseminated to schools in Pahang, which were selected by the State Education Department. At the end of 2000 after one full year in usage and circulation, a questionnaire was prepared and sent out to the schools to ascertain the level of understanding of wetlands and how useful the Kit was as an education tool. The questionnaire was analyzed and 65 % stated that the Kit was innovative in the approach used and the activity sheets were fun to do. Also, 72 % responded that they better understood the functions and values of wetlands.

A network called the Friends of Tasek Bera comprising teachers from the selected schools and members of a local Nature Society based in Kuantan was formed in mid 1999. This network comprising nature enthusiasts have visited Tasek Bera in the school holidays with respective family members and students from nearby schools from time to time in the last 3 years and exchanged information through a group newsletter. The Kit was first used in Tasek Bera Wetlands in January 2000 when a group of teenagers from a college in Selangor State visited the site. At the time, Wetlands International officers were helping out as facilitators for nature based camps at the wetlands whereby the activity sheets and learning modules were used as resource materials for nature interpretation.

Education and training in the integrated management plan

It should be noted here that one of the immediate objectives of the Integrated Management of Tasek Bera Project is:

To integrate the orang asli (Semelai) into the provisions for management, wardening and guide services at the site.

In line with this objective, a Community Development Program (CDP) has been developed as part of the Project. Although, the CDP includes all local communities living within the Tasek Bera Ramsar site, priority attention will be given to Semelai villagers as stated in the Government Project Agreement. This is because:

- The Semelai rely on the natural resources of Tasek Bera through hunting, fishing and gathering of forest produce and are closely associated to the Ramsar site.
- They are disadvantaged in comparison with other rural communities in the area in terms of their socio-economic, health and education status.
- They are in need of various forms of development, especially in order to improve their standard of living.

The goal of the CDP is: To develop the capacity of the Semelai in order to enhance their socio-economic status and to ensure their active participation in the management and wise use of Tasek Bera.

As such, another major aspect of the training programme is to provide training for the Semelai community in line with the needs of the Community Development Programme.

The training needs of the Semelai are detailed in a Community Development Strategic Plan. Most of the long-term objectives in the Plan will run beyond the term of this three-year project. As such, priority activities will be selected based on the feasibility within the project period and importance for the project's success.

In establishing a training program, the Ramsar Convention recommends that attention be given to specific areas, namely:

- the target audience
- the definition of training needs
- the differing needs between sites (the first step being an analysis of training needs to establish what is already available and what may not be covered by existing programs)
- the subject matter

Indigenous Semelai guides at Tasek Bera

In January 2001 Wetlands International- Malaysia Programme secured a grant from the UNDP - GEF Small Grants Programme to carry out an 18-month project entitled "Community-based Eco-tourism for the Indigenous Semelai Community in a Ramsar Wetland of International Importance- Tasek Bera, Pahang". During this project the Wetland Education Kit and its various components were used as resource materials in the training of the nature guides who comprised selected individuals interested in eco-tourism activities that were chosen from the Semelai community and lived in Tasek Bera. The guides were trained how to use the Kit effectively during guiding and interactions with tourists during jungle trekking and boat rides. For the past 2 years the Semelai nature guides have used this Kit and familiarized themselves with its various components. A television and video player was also purchased under the UNDP - GEF project which was handy tool for the young Semelai children to view the video tapes on Tasek Bera Ramsar site which is home to some 94 fish species, 19 amphibians, 43 reptiles, 230 birds, 67 mammals and 374 plant species.

Sustainability and replicability of the Kit

In Wetlands International (WI), a global organization involved with wetland conservation, we believe that ideas, concepts, methodologies and outputs can be replicated and modified to suit different target audiences and needs in each of the WI country offices.

Funds have been successfully raised in the Cambodia and Thailand offices of WI to develop a similar wetland education Kit for a particular wetland site or for general wetland types. Currently two Wetland Education Kits exist both in the Thai and Khmer language.

In Malaysia, the programme office is adding on educational outputs like a field manual to a freshwater system to enhance contents of the Kit. This is an evolving and continuing process, which will make wetlands education a sustainable and effective one.

The future of education or outreach programmes in wetlands solely depends on commitment and sharing of experiences from various key players.

Lessons learned from the Kit

- The education output must be seen to enlighten as many people as possible, although the target group in this case was school children. However since its production in early 1999 to date, many different groups of youth and people from different walks of life especially nature lovers and visitors to the Ramsar site have also been exposed to the Kit and subsequently used the Kit via nature interpretation by local guides. Some interested individuals have borrowed it from the library at Wetlands International's office in Malaysia.
- An education output on conservation can only be successful if the trainer or person in charge of communicating the contents can optimize its usage by instilling a strong message of the importance of environmental and or wetland conservation. In this case the teachers and Semelai local guides were trained in how to use the Kit in a classroom atmosphere or in the field with the help of a teachers' guide to the activity modules, which is included in the Kit.
- Outreach has been effective and the Kit is making a difference to many more people that it was initially intended for.
- The benefits of the approach has been very encouraging in social terms- the interactions between different levels of society and the indigenous Semelai people; in economic terms- it has brought some monetary gains to the guides as an additional source of income during guided tours at Tasek Bera; in environmental terms- a strong message about significance of wetlands and its inextricable link to man and the need for conservation of these fragile ecosystems to different groups of people from all walks of life.

The Kit a pioneering example

Firstly there has never been a comprehensive set of educationcum-awareness materials on freshwater wetlands. This Kit has teaching modules in a different format and style for popular use in wetland education. In the past there have been materials developed in a book format only. It is the first of its kind and developed together with teacher trainers who have had lots of experience in classroom type education. In actual fact this Kit can be used at wetland camps, nature walks at Tasek Bera as well as in school classrooms. The Kit was exhibited at Wetlands International booth in May 1999 at the 7th Ramsar Conference of Parties in Costa Rica. There was an overwhelmingly response and demand for copies to be sent to various organizations. Before the end of the Project, the Kit was used in schools in the state of Pahang where Tasek Bera is located. The feedback obtained from both the teachers and the students has been very encouraging and positive. The end users of the Kit have found it interesting and informative.

Measuring the success of an education output is not an easy task but it can be done via filling out evaluation forms or questionnaires and analyzing the responses. However, to be frank, an awareness and education programme ought to change people's attitudes, perceptions and behaviour and this can only be achieved as a long-term goal. It is hoped that this will be the longterm impact of the Tasek Bera Wetland Education Kit. Each year new batches of students are exposed to the contents of the Kit and the impact may not be immediate and significant but it is envisaged to have an impression on the young minds about Ramsar sites, values, functions, attributes of wetlands and the inextricable link between people and wetlands. Another important point is that the trained nature guides belonging to the Semelai indigenous tribe are using this Kit in their guided walks along trails, in the boat tour as well as during an introductory talk to school children at Tasek Bera.

Major elements in the Kit

Major elements that made the Kit popular are mentioned below:

• It is written in a simple style and easily understood by schoolchildren.

- The text contains information on the Semelai tribe who has lived in Tasek Bera wetlands since 600 years. The Kit has demonstrated the strong link between man and wetlands.
- It has brought home the environmental message effectively and in a fun manner.
- Awareness on the uniqueness of this Ramsar Site and on why the site needs protection has increased, while there is an introduction to the "wise use" concept of wetland resources.
- The Semelai guides and boatmen use the Kit in the wetland camps held at the Ramsar site and there is a sense of ownership, which makes them proud of their culture, way of life and heritage at Tasek Bera.
- The Kit has elements that make it easy to use and these include hands-on type of activities that are fun filled and easy to understand.

Conclusion

During the past few decades, humans have drastically changed the world and its environment. Many of the changes have resulted in dramatic improvements and significant progress in every field of human endeavour. But it is also true that some of these activities were, and are still being done, at the expense of a healthy environment. In our effort to conquer nature, we have perhaps forgotten that humans are an integral part of nature. There is now a threat and potential danger posed by nuclear pollution, species extinction, acid rain, the greenhouse effect and desertification. The need for educating people about the deteriorating environmental situation and for its conservation is perhaps more urgent than ever before.

Wetlands are vital for sustaining human life and must be managed accordingly. Communication is the link from science and ecology to people's social and economic reality. Without communication, conflicts over wetland management and ongoing degradation and loss of wetlands, their function, services and values will continue to take place.

NEPAL

Education through Learning By Doing

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Background

Nepal being a very small land locked country situated in the lap of Himalayas is very rich in biological diversity. The country is mostly mountainous and hilly. Topographical variations are very sharp and have a large impact on climate and biodiversity of Nepal. Nepal is also one of the richest country in freshwater resource. There are more then 11 rivers flowing from north to south originating from Himalayas and passing to India. However there are three main river systems, Koshi, Gandaki and Karnali. Besides, there are various types of wetlands such as floodplains of the rivers, ox-bow lakes, swamps, marshes, reservoirs, ponds and paddy fields. There are more than 163 such wetland sites recorded in the country (Bhandari, 1996).

The Ghodaghodi Lake system is an ox-bow type of lakes situated in Kailali district in the Midwestern development region of Nepal. This system includes a cluster of nine different lakes within an area of about 8.25km2 forest. Since the district is in the plane area covered with forest and friable agricultural land, people from other parts of the country came to settle here en masses. The process was more enhanced with the opening of the east-west highway across the district. These processes, along with deforestation are disturbing the wetland ecosystem and deplete the natural resources including wetlands.

Location

The Ghodaghodi lake area is situated in the juncture of three Village Development Committees (Darakh, Ramshikharjhala and Sandepani) of Kailali district, Far-western Development Region of Nepal. The geographical coordinates of the area are 28° N latitude and 80 E longitude with an altitude of 205m. This area is rich in wetlands surrounded by non-timber natural forest and Sal (Shorea robusta) forest. The wetlands system includes a cluster of nine lakes with about 248 ha under water. These lakes are Godaghodi Tal (138 ha), Nakhrodi Tal (70 ha), Ojhuwa Tal (6 ha), Purba Ojhuwa Tal (5 ha), Baishawa Tal (10 ha), Budhi Nakhrodi Tal (6 ha), Chatiya Tal (3 ha), Ramphal Tal (5 ha) and Sunpokhari Tal (5 ha) (IUCN Nepal, 1998).

Topography

The lakes are with several fingerlike notches and irregular in structure. The main Ghodaghodi lake is palm-shaped with more then 15 fingerlike structures. These finger-like structures make interesting and time taking for tracking (about 5 hours on foot). The Ghodaghodi lake covers about 150 hectares of land area and it is variable with the season. The depth is up to 6.5 m (IUCN,1998).

Flora and Fauna

The area is associated with grassy marshes, aquatic weeds and surrounded by forest. The land is highly productive and offers excellent habitat for flora and fauna including wildlife and wintering sites for many migratory birds. From this lake area, 244 species of plants, 27 fish species, 140 species of birds, and 34 mammals were reported (Baral, 1992 and IUCN, 1998).

Settlement and the people

The Ghodaghodi lake area supports more than 400 households who are extensively dependent on plant and animal resources of the area. The indigenous people (mostly Tharus) are fond of fishing and collect fuel-wood, fodder and wild vegetable and fruits. As a result of over-exploitation of these resources, rattans are in the verge of extinction. Similarly, the over pressure may cause extinction of economically valuable species of flora and fauna causing environment deterioration. Besides the low level of awareness about environmental education, there is a need to enhance the level of environmental education at the community level. There is already shortage of trained manpower for environmental education (Bhandari, 1998) and it may cause adverse effect on sustainable livelihood of the community living there.

The people with very low income and limited opportunities inhabit the place. They have to sustain their family relying totally on natural resources, mainly on the forest resource. This has forced them for the encroachment of the forest area and the resources are exploited in most unsustainable way. The flow of people to the forest for their daily needs of fodder, fuel wood and other forest products is ever increasing. The cutting of forest in the watershed area is not only depleting the biodiversity but also eutrophication of the lakes is taking place. This also holds true to the fauna, due to constant loss of habitat. The deforestation of watershed area is threatening the lake to dry out, which in turn will damage the wetland habitat.

Endangered ecosystem

The Ghodaghodi lake and its surroundings areas are an ideal habitat for several types of flora and fauna. The lake provides shelter to several wild life and supplies moisture to the surrounding areas. Several migratory birds come to pass their winter and they stay in the area according to the weather conditions. Growing population is exerting heavy pressure on the forest resources. Traditional knowledge is disappearing about the minor but important ethnobotanical uses of forest products such as medicinal uses. This process is affecting conservation in three ways, forest degradation, silting of the lake and lowering its tourist potentiality.

Management plan

Conservation of those indigenous species along with sustainable harvest for the benefit of the community is a felt need to the community living in the area. The needs assessment and intensive discussions with local community identified following causes of resource degradation,

- Lack of clear-cut boundary of the area: Since the area is encroached from all the sides of the lake system it is necessary to make clear-cut demarcation and declare the protected area.
- **Inadequate data on encroachment:** There is no record of exact data for encroachment of the area.
- Lack of data and information: Although the area is ecologically and environmentally very rich but the there are no proper scientific inventory of these resources.
- Lack of public awareness: Community living in and around the area are not properly aware of the resources existing in the area. And they are not able to use for the benefit of the community.
- Extent of community participation and involvement: Local community is not involved in the developmental processes of the area directly, rather there is conflicts regarding the ownership and governance leading to the misuse of the resources.
- Lack of coordination and cooperation among the users: Mostly the communities living there are migrants from the hills and other parts of the country except the local Tharu tribes, have different social norms and feelings. Thus the low level of social harmony also reflected in the irrational use of the natural resources.

On the light of above findings following main priority areas were identified for conservation and management of the lake system.

- Management of upstream and downstream: Strengthening the existing dams and conservation of flora and fauna to protect the biodiversity through community participation.
- Management of lakes and lake resources: Lake system is very rich with the wetland resources and needs in-situ conservation, after fixing the boarder of the conservation area.
- Education, training and community awareness: Environmental awareness of the local communities needs to be enhanced and should start from schools.
- **Eco-tourism development:** The area can be developed into a recreational site for attracting tourists. The package has to be developed with income generating activities through promotion of their traditional arts and cultures.
- **Involving local NGOs and CBOs:** Involve the local community people through NGOs and CBOs for capacity building.
- **Establishing management authorities:** A management authority comprised from all the surrounding VDCs need to be formed for managing the area.
- **Empowerment of women and local communities:** Capacity building of women of the area is to be enhanced through technical assistance, training and education for the conservation of activities. Community people are to be encouraged for initiating income-generating activities.
- **Conservation of religious and cultural heritage:** Conserve the traditional cultures and religious heritage sites of the area.
- **Development of alternatives to resource use:** Encourage the community people to identify and promote for alternatives of the resource use.

Management strategies

Over three dozen actions are suggested. In order to promote the opportunities of conservation in the Ghodaghodi lake area, it is important to know the resource status of the area and secure people's participation in the management works, for which a series of initiatives should be taken immediately. Some of them are;

- Comprehensive investigation of biodiversity (flora and fauna)
- Capacity building of local NGOs/CBOs in implementation
- Environmental education and literacy program
- Promotions of indigenous knowledge and skills.
- Study on alternative lifestyles.

Community involvement

Above mentioned activities are expected to raise the level of income of the poor people and make them less dependent on the forest products for their daily need. This is also expected to conserve the plants of economic value of the locality in situ and maintain the diversity level even in the farmers' fields sustaining their agricultural system. This will lead to reduction of human pressure on the forest thereby ensuring the sustainable livelihood of the people in the area.

A number of NGOs and CBOs are locally active in the area but lack of resource and capacity to manage the resources wisely. Their activities could be made effective if their capacity is developed. For this reason local NGOs and youth leaders will be given training and technical support.

Biodiversity resources

These lakes are the habitat for many aquatic life as well as wild life of surrounding area. Lakes are rich in fish bioderversity with 27 fish species (IUCN Nepal, 1998). However, the report on fish species was based on participatory interview. The lakes in Ghodaghodi area supports more than 400 households for fishing of fish, crabs, snails and turtles (IUCN Nepal, 1998). Over exploitation due to over fishing may cause extinction of these species and environment and the community may suffer in future. Though Ghodaghodi lake is heavily infested with submerged and emerged aquatic vegetation, water clarity is high and still in oligotrophic to mesotrophic condition. It requires biological methods to protect from eutrophication and to keep environmentally safe. Therefore, conservation of these indigenous species along with judicious harvest is needed for sustainable livelihood of the community people. In this context, a detailed study on aquatic biodiversity and its population dynamics over the time (seasonal changes over the period of one year) is imperative in order to come out with appropriate conservation measures of all the species and maintenance of optimum population stock for regeneration. Alternative approach to overcome the fishing pressure also has to be explored and implemented for the benefit of community to conserve the biodiversity of this Ghodaghodi lake area.

Traditional skills

The women of Ghodaghodi lake area particularly Tharu women are mostly engaged in harvesting of wetland resources along with agricultural and domestic activities. Providing alternatives for income generation can only reduce the dependency on natural resources. Such programs should be environmentally sustainable. Tharu women of the area possess remarkable skills on clay pottery, clay and wood artifacts, baskets, mats, etc. based on entire locally available resources. This should be promoted by providing external technology for improvement, credit facilities and market knowledge.

Lake eutrophication

The Ghodaghodi lake area is beset with a multiple environmental problems, which are the manifestation of continued unplanned and irrational human interventions occurring in the area. These activities are responsible for causing eutrophication and filling up of the lake. The high nutrients cause profuse growth of aquatic weeds and algae, ultimately reducing the amount of dissolved oxygen in the surface water. This adversely affects aquatic life sometimes even leading to the death of fishes. Vegetation succession is also caused by eutrophication with siltation, an example of which is the marshy floating islet seen in the middle of the lake

Recommendations

On the basis of the conclusion obtained from participatory exercises and scientific information, the following recommendations have been made.

- 1. Initiate participatory implementation of plan and actions.
- 2. Conduct multidisciplinary actions and basic scientific research to fulfil the gaps on priority areas identified in the management plan.
- 3. Transferred management responsibilities to local government body (Ghodaghodi Kshetra Samrakchhan Sangh) to solve the boundary demarcation, ownership, and conflicts on the resource use.
- 4. Strengthen the NGO technically and financially for its sustainability in the initial period.
- 5. Declare the Ghodaghodi lake area as a conservation area under the appropriate legislation.
- 6. Conduct formal and informal conservation awareness programs to the communities and schools for the restoration of wetland resources.
- 7. Upgrade regular monitoring and evaluation.

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PHILIPPINES

Wetlands in Environmental Law Education

Amado S. Tolentino, Jr.

Environmental law in developing countries was first addressed in 1977 at the UNESCAP sponsored Expert Group Meeting on Environmental Legislation held in Bangkok. This was followed by a 1982 Intergovernmental Meeting on Developing Countries on Environmental Law in Geneva. Thereafter, in 1982, an Hoc Meeting of Senior Government Officials and Experts in Environmental Law (Montevideo, Uruguay) convened by the United Nations Environment Program (UNEP) formulated the first 10 year Environmental Law Plan which incorporated the needs and actions desired for environmental law development including environmental law education particularly in developing countries.

All the meetings mentioned above reached the conclusion that an impediment to real progress on the environmental fronts is a dearth of indigenous or local lawyers educated in the way in which law can be used as a tool for environmental management. As a consequence, government do not have readily viable source of creative legal thinking with respect to new environmental challenges. Moreover, since courses in environmental law are not taught in universities in developing countries, there is no immediate prospect of remedying the deficiency.

One solution in sight at the time is the inclusion of environmental law in the curriculum of law schools or the conversion of the old Natural Resources Law which is "use-oriented" to the new environ-
mental law which is "resource-oriented". "This would naturally entail an urgent effort to furnish practical instruction in environmental regulatory techniques. The instructions should be aimed at lawyers already working in government agencies charged with environmental responsibility and law faculty members who are in a position to institute the new environmental law concern at the university level." Furthermore, relevant reaching materials need to be prepared and distributed adequately to support the introduction. A new university course in environmental law should be developed. The objective should be "to create, through the years a cadre of lawyers of furnishing their governments with sound, innovative advice in this critical area."

After efforts by Philippine environmental law pioneers spanning 20 years, the University of the Philippines (UP) College of Law finally included Environmental Law as an elective course in the law school curriculum. Soon thereafter a few other law schools in the country followed suit inspired perhaps by the call from the Asia-Pacific Center of Environmental Law (APCEL) at the Faculty of Law, National University of Singapore to a four-week course (IUCN/APCEL/UCEP Training the Trainers Course on Capacity Building for Environmental Legal Education) for university professors in the Asia-Pacific. The first training course was offered in 1997. Most of the "Training the Trainers" alumni have, on return to their countries, introduced the teaching of environmental law based, generally, on the syllabus and materials developed at APCEL.

Be it noted that teaching environmental law as an elective/ optional course at the U.P. College of Law began in 1992 immediately after the Rio Summit which brought forth Agenda 21. APCEL's "Training the Trainers" program, on the other hand, began only in 1997.

Informed of inclusion of Environmental Law in the U.P. Law School curriculum as a two unit course with class meeting twice a week for one hour, a group of Filipino lawyers banded together to team teach the subject using a course "Seminar on Law and Environment"¹.In addition, the group produced the first "Environmental Law in the Philippines" textbook2 as additional reference book. In doing the book, authors were guided by the report of UN World Commission on Environment and Development, "Our Common Future," which categorized the environment sectors as follows: (1) Population and Human Resources; (2) Species and Ecosystems Resources for Development; (3) Food Security; (4) Energy; Industry; and (5) Land Use. Thus the book touches on the legal aspects of environmental protection and the sustainable use of natural resources. Later the group produced a "Supplement to Environmental Law in the Philippines"3 basically to introduce Agenda 21 and some recent international environmental agreements.

The syllabus of the Seminar on Law and Environment fits the team on collaborative teaching with the ten topics handled by the five environmental lawyers at different times during the semester. Apart from the use of the reference books, "*Our Common Future*" and "*Environmental Law in the Philippines*", the selected applicable decisions of the Philippine Supreme Court are taken up to better understand in-depth the different areas of coverage of environmental law. Likewise various published articles concerned with environmental laws are also required as a supplementary reading.

¹ This course contains the following units; (1) overview, concepts and principles of environmental law; (2) constitutional considerations and environmental legislation in general; (3) population and human resources; (4) food security; (5) species and ecosystems, resource for development problem areas; (6) energy problem areas: energy utilization, mineral resources and nuclear issues and hazardous wastes, (7) industry problem areas: air quality, water quality, industrial pollution (including mining); (8) land use areas: zoning, coastal zone management, environmental impact statement, solid waste management, shelter, tourism, agrarian/urban land reform; (9) environmental litigation; (10) international standards.

² The book contains seven chapters, which are (1) introduction to Philippines environmental law; (2) population and human resources; (3) food security; (4) species and ecosystems: resources for development (forestry, parks and wildlife legislation, biological diversity); (5) energy and mineral resources; (6) industry, pollution prevention and control (Introduction, statutes, evaluation and recommendations); and (7 land use.

³ This document has eight chapters, which are (1) Earth summit: press summary for agenda 21 final text; (2) Convention on biological diversity; (3) United Nations framework convention on climate change; (4) Basel convention on the control of transboundary movement of hazardous wastes and their disposal- final act; (5) Basel convention on the control of transboundary movement of hazardous wastes and their disposal- preamble; (6) Republic Act no 6969 (1990); (7) Republic Act no7586 (1992); and (8) Republic Act no. 7611 (1992).

To lessen the heavy reading load of the students, panel and discussion methods were also in use. Latter, field trips, for example, to the environment-oriented government agencies, coastal areas, fish environment canning factories, laboratories, etc. were conducted. Also, a specific issue affecting the Philippines environment is required for submission as a project.

Wetlands in environment law education

As a topic, wetland is multi-sectoral. It, therefore, appears in the section on food security(Fisheries and Aquaculture, Agriculture); Species and Ecosystems (Parks and Wildlife, Forestry, Soil Conservation); Land Use (Zoning; Coastal Zone Management; Environmental Impact Assessment, Solid Waste Management, Shelter; Tourism); International Standards (Ramsar Convention on Wetlands). In connection therewith, teaching is greatly supported by factual materials about various wetlands types, information about their economic importance as well as the policies, rules and regulations on wetland resource utilization, development, management and wetland ecosystem conservation.

First hand experience at environmental law teaching in the Philippines revealed environmental law is a very broad field. It includes the law relating to environmental protection (e.g. environmental impact assessment, air, water, noise and land pollution) and the management of natural resources (e.g. sectoral legislation on forests, water, marine, resources, soil, energy, biological diversity). The team or collaborative way of teaching the subject gives ample opportunity for the inclusion of wetlands by different instructors in such topics as protected areas and wildlife, biological diversity, integrated coastal zone management, climate change, fisheries, aquaculture and agriculture as well as environmental treaties. Likewise wetlands find place in panel and group discussion owing to wetlands' cross-sectoral concerns or interrelated activities that are essential in the capacity building for the realization of sustainable development.

Be that as it could still be done to "introduce" wetlands in an obviously "crowded" environmental law course. For one, the diversity of wetland types calls for a teaching objective that provides a solid grounding in public participation procedures on the environment, on the development, health and safety and citizen enforcement rights. In furtherance thereof, teachers could try one of several different teaching models. Among them:

- The media approach: Each environmental medium like wetlands can be explained separately in terms of it international law, example of the best national regimes, how states administer such systems, etc.
- **The juridical approach:** First the international law and principle are explained, followed by the framework for national wetland regimes for environmental protection.
- **The practice approach:** The system of actual wetland protection, liability and management are taught from a skill training perspective.
- The "selective" problem approach: In line of comprehension coverage, a set of select topics e.g. wetlands, might be chosen, and tried in different years. Case studies would be used extensively.

How do we move wetlands in environmental law education forward?

The following is an example of an environmental law curriculum wherein wetlands could be freely introduced.

- **Core environmental law:** What is the field and its main outlines and examples of its legal provisions. To be supplemented with examples of national environmental laws.
- International environmental law: The patterns of international public law on the environment and how these are implemented.
- **Procedures and practice of environmental law:** The processes and rules for implementing environmental laws.
- Selected topics of environmental law: A survey of advanced issues, beyond those that time permits to cover in the basic core environmental law course.

- THE)
- Economic aspects of implementing environmental laws: A survey of the leading economic means to attain implementation of environmental norms. This is in furtherance of sustainable development and an attempt at poverty alleviation.

With cultural values of wetlands coming in as a new dimension in wetlands management and cultural environment is becoming a focus of the environmental movement. We could expect wetlands to enter the mainstream of the law curricula in universities where environmental law is being taught or will be introduced.

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THAILAND

Education for Surveillance

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Wetland education and communication is the key foundation of sustainable management and wise use of wetlands. In an effort to mobilize children, youth and community, a comprehensive wetland education and communication approach is used as a basis and a long-term strategy for wetland surveillance and management in Thailand. The approach has been applied in River and Stream Investigation Project for Youths (River SPY). This paper discusses about how awareness program was translated into a community surveillance activity in the Ping River basin.

Background

The River and Stream Investigation Project for Youths (in short known as River SPY) is initiated by the Green World Foundation, a non-governmental organization in Thailand. The purpose is to improve the quality of streams and rivers through activities such as raising awareness among local children and communities.

Objective

The Project aims to enhance environmental education among teachers and students specifically monitoring the quality of streams and rivers as well as to strengthen their capabilities for communicating and cooperating with local communities in taking care of rivers and streams within their surroundings.

Demonstration

The Project is implemented as a pilot project by the Green World Foundation, the Provincial Environmental Education Centers in cooperation with some 46 schools (teachers, school children, youth and local communities) in the Ping River Basin in the northern Thailand.

Approaches

- Development of the user-friendly methods and inexpensive means to empower the children, youth, and the public to monitor and evaluate the quality of streams and rivers in their locality. These include a stream and river investigation tool kit and a guideline folder for classification of freshwater invertebrates of marshes, ponds, rivers and streams, which can be used as potential water quality bioindicators.
- Co-ordination of a network of the teacher and student of the secondary school in the Ping River Basin, in accordance with the Provincial Environmental Education Centers (PEECs) school network.
- Involvement of students and teachers in regular surveys and monitoring of river and stream water quality and active learning about river and stream ecology by the young and raising awareness of the role they can play in taking care of the nearby streams and rivers. The Project supports the concept of student-centered education by encouraging schools within the river basin to undertake field activities and use wetland ecosystem as a natural laboratory.
- Engaging local communities in the network for surveillance and protection works in the river. Training for local community members to act as trainers and assistants for teachers and student leaders.
- Regular surveys of the Ping River water quality by the participating schools and communities.
- Regular network meetings.

- Sharing environmental information between children and local communities. Children and youth are exposed to local knowledge and wisdom, local history, traditional ways of life and river care through cross-generational learning. The new findings by the children and community members about the river environment are discussed together.
- Compilation of information to create a comprehensive overview of the entire Ping River Basin and publication of the Ping River WATCH Report.
- River Spy Newsletters (bi-monthly) sent to schools, communities, and conservation groups at large.
- Establishment of the Ping River Investigation Day to present the Ping River WATCH Report and activities and disseminate information to the community leaders, the general public and interested parties.

Effectiveness

The River Spy Project has been successful in generating interests among school students, teachers and local communities and motivating themselves in the management of the river basin. The Project is considered a good example of its practical approach and methods. It can be used in other river basins due to the following characteristics; (1) clear objective, (2) actions oriented, (3) appropriately designed for grassroots people, (4) area-based and issues-based design, (5) clear strategy to bring behavioral changes, (6) simple methods and tools which can be easily put into practice in daily life and is applicable to other river basins, (7) participatory in style involving a diverse stakeholders and volunteer networks of all ages and walks of life, and (8) participatory environmental education, communication, and awareness raising activities via environmental quality monitoring and surveillance.

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http://www.greenworld.or.th

THAILAND

Education for Stakeholders in Sanctuary¹

U Tin Than

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Introduction

In 1991, UNESCO announced both the Huay Kha Kaeng sanctuary and Thung Yai Naresuan Wildlife Sanctuary - the heart of the Western Forest Complex (WFC) - as World Heritage Sites. The World Wide Fund for Nature (WWF) recognizes the forests of the Thongchai and Tenasserim Ranges as "Kayah-Karen Tenasserim Ecoregion". The goal of ecoregion is to save life on the earth. This ecoregion is one of the 200 key ecoregions worldwide.

The conservation of the biodiversity of the Western Forest Complex is an extremely important task. This is possible only through environmental education. As part of the long term conservation effort, WWF Thailand implemented the Huay Mae Dee Environmental Education (EE) Project in the Western Forest Complex in cooperation with the Department of Education, the Royal Forestry Department of Thailand (RFD) and the Provincial Office of Uthai Thani. Its long-term goal is to conserve the biodiversity and promote sustainable development in the area, while the immediate objective is to increase environmental skill of stakeholders such as local teachers, teacher supervisors, forest rangers, community leaders, monks, and the residents of Karen villages.

¹ The above short account of the HMD EE project is based on DANCED's review Reference Numbers: 123/340-0168 and 123/340-0058 and proposal for strengthening environmental education in Thailand (SEET), WWF-Thailand Program Office.

Project description

The Huya Mae Dee EE Project for the conservation of the Western Forest Complex is a 3-year pilot project funded by the Danish Cooperation for Environment and Development (DANCED). The Project was carried out in January 1998 and completed in December 2000. After the completion of the Project, WWF Thailand implemented one year extension to replicate the demonstration activities and to continue some activities in the buffer zone.

The Project site touches three districts adjacent to the Huay Kha Khaeng Wildlife Sanctuary in Uthai Thani province. The sanctuary has been recognized as a world heritage site due to its unusually rich biodiversity. The Project was, therefore, designed as supplementary to a DANCED funded Integrated Conservation and Development Project (ICDP) that would assist in providing sustainable livelihoods to the local communities.

WWF-Denmark is responsible for executing the project whereas WWF-Thailand is to implement the project in collaboration with RFD and the Ministry of Education (MOE). As a national NGO, WWF-Thailand has set up a network of government departments and local villagers and thereby being successful in resolving local conflicts.

The Project aims at enhancing local capacity to ensure conservation of unique world heritage site of the Huay Kha Khaeng Wildlife Sanctuary with the immediate objective "of improving the environmental knowledge, attitudes, and skills of key stakeholders, through the implementation of a pilot project on environmental education".

Basic assumption of the Project is that "by performing environmental education activities, the environmental knowledge and attitudes of the stakeholder will be improved, leading to a more environmentally sustainable life style of these stakeholders, e.g. with regard to the long-term protection of the Western Forest Complex".

The original idea at the time of developing the Project in 1996 was that the EE Project would be complementary to the DANCED supported ICDP in the Huay Kha Khaeng Sanctuary. With the two projects, DANCED would support a coherent overall solution to the complex problems that threaten the WFC. The long-term development objective was subsequently formulated "to ensure the longterm conservation of the biodiversity and ecological functions of the Western Forest Complex, and the sustainable development in the adjacent districts and provinces".

This development objective should be considered in conjunction with the Danced supported Huay Kha Khaeng ICDP. Subsequently the assumption of the EE Project is that "change to a more sustainable life style can only take place if the different stakeholders have real alternatives to their present life style".

Target groups are primary and secondary school students including teachers, teacher-supervisors and school principles. Also monks, local community representatives, community members of Karen groups and stakeholders were targeted to ensure coordination in the area. The Project is playing a vital role in raising awareness among school students in the area about conservation of natural resources and environmental management.

Project Implementation and Performance

The Project sets out one development objective, one immediate objective and twenty-three outputs. The outputs are categorized into five groups.

Output Group 1: Infrastructure, equipment, staff and planning

- *Output 1.1*: Detailed Project Implementation Plan (PIP) developed. PIP was developed during the inception phase by the project staff, and approved by the project steering committee at its meeting of 4 June 1998. PIP provided details on activities, identified the expected results, allocated responsibilities, and set out time frame for action.
- *Output 1.2*: EE Center established. An EE center was completed in August 1999, and formally handed over to RFD in September 1999. And the Project allocated budget for the purchase of audio-visual equipment.
- *Output 1.3*: A coordination office established in Ban Rai district.

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- *Output 1.4*: Necessary equipment for EE outreach activities (mobile EE unit) provided. An office was set up near Ban Rai to accommodate the increasing number of the project staff.

Output Group 2: EE training activities

- *Output 2.1*: Some 25 protected area staff received a training of 7 week duration.
- *Output 2.2*: Training given to 44 teacher-supervisors from local districts.
- *Output 2.3*: Training given to about 50 school principals.
- *Output 2.4*: Approximately 250 teachers from local schools participated in training courses. Another 297 teachers including teachers from six model schools participated in the seven-day training course.
- *Output 2.5*: The course was provided to 200 secondary students. This has an impact on a high number of students (641 students).
- *Output 2.6*: At least 44 community representatives received training.
- *Output 2.7*: About 50 monks participated in the course. Another set of 55 monks took part in a five-day course in 1999.
- *Output 2.8*: About 50 Karens from WFC have participated in a course. A 5-day study tour was organized for 73 Karens to observe the traditional lifestyle of the people dependent on forest and its resources.
- *Output 2.9*: At least 3 EE courses were organized for Peace Corps volunteers, Buddhist novices and the members of the Community Forest Committee.

Output Group 3: Outreach activities initiated

- *Output 3.1*: EE focal points identified in three districts and one province.
- *Output 3.2*: Model school established in one district. At the suggestion of the teacher supervisors, and with the support

of the Primary School Committee, six model schools were selected, two from each district.

- *Output 3.3*: EE activities in 50 schools carried out.
- *Output 3.5*: EE activities in 10 monasteries carried out. The strategy for these three related activities involves the distribution of appropriate materials and the support by project staff to activities originated from the target groups, i.e., from the buffer zone villages identified by ICDP.
- *Output 3.6*: EE through local media was carried out. Radio messages were being broadcast in 2000. Local print media were also used in raising awareness of local communities.

Output Group 4: Links to other protected areas and national policy makers

- *Output 4.1*: Project activities shared with 50 important EE Stakeholders from other parts of Thailand. A seminar was organized in August 1999 with 40 educational supervisors from all over the country and 19 representatives from NGOs involved in EE. Participants shared their experiences, practices and ideas on environmental education.
- *Output 4.2*: Experiences shared at national policy through workshops for policy makers from RFD, MOE and other departments. The Project briefed senior officials with ONPEC, MOE and MOI.

Output Group 5: Monitoring, evaluation and follow up activities

• Output 5.1: Programs for monitoring the project implemented. The Project staffs were able to conceptualize, implement and document the monitor activities, particularly of rangers and teachers.

Project Performance

In general, the Project performed well. The project team responded to changes and opportunities. Doing Education at Wetland Sites: Examples and Modalities from Asia

Factors affecting implementation and performance

Various unexpected factors arose that affected the implementation and performance of the Project, some of which are mentioned below.

- Opportunities arising from the positive response from provincial authorities: In general, there was a very positive response from the educational sector, ranging from the director of provincial Primary Education Office to primary school teachers. This created new opportunities for the Project to carry out educational and outreach activities.
- Failure of the RFD management to take up its intended role in the Project: It was anticipated that RFD would play a central role in the implementation and the management of the Project. However, it did not happen. Their involvement is the key to the sustainability of the Project.
- The failure of the buffer zone of ICDP to operate in HMD Project area: The buffer zone of ICDP was intended to play an important role in addressing the socio-economic issues of people living in the buffer zone villages of the HMD (Huay Mae Dee) EE Project. This means the project was unable to offer any complementary support and assistance in taking up more sustainable environmental practices.

Analysis of explicit and implicit project assumptions

The basic assumption of the Project was that "by performing environmental education activities, the environmental knowledge and attitudes of the target stakeholders will be improved, leading to a more environmentally sustainable lifestyle of these stakeholders, e.g. with regard to the long term projection of WFC." It was, however, considered that the "change to a more sustainable lifestyle can only take place if the different stakeholders have real alternatives to their present lifestyle." The Project, therefore, was considered as a "necessary complementary effort" to ensure a "coherent overall solution to the complex problems that threatened the Western Forest Complex." In reality, this basic assumption was the key to the success of the Project. Another assumption deals with the organizational set-up of the Project. RFD was originally assigned an important executive role for the day-to-day implementation of the Project. However, WWF-Denmark was responsible to Danced for the implementation and supervision of the Project and the Director of WWF-Thailand Project Office, as project manager, is responsible for the implementation of the project in Thailand. It was not expected that a RFD staff person would take responsibility for the execution of the Project. So, this responsibility was shifted to the WWF Environmental Education Specialist, who took the responsibility of day-to-day administration. By giving considerable attention to the role of RFD, the implicit assumption was that RFD could accumulate the experiences in the Project. This seems to be a somewhat missed opportunity.

Analysis of objectives

The development objective of the Project "*Biodiversity and ecological functions of the Western Forest Complex is conserved and sustainable development in adjacent districts and provinces are achieved*" can only be obtained by complementing the present project, focusing on environmental education, with activities targeting the population in the adjacent districts and provinces to pursue sustainable economic activities that will sustain their daily livelihood.

It was originally planned that the present Project would be a complementary effort to the ongoing buffer zone ICDP in Huai Kha Khaeng. However, the support was terminated by the end of 1999 and no other projects were targeting the socio-economic situation of the target groups. Various groups of stakeholders who, though appreciating the activities of the Project, felt that awareness of environmental problems didn't assist them in their daily life, and still continue to pursue non-sustainable economic activities. They were struggling with uncertainty of land tenure, lack of extension services and lack of proper marketing organizations, increasing prices of agricultural inputs combined with falling price of their marketable surplus. This forced them to continuing their old habits of chasing wild animals and collecting non-timber forest products and timbers for construction purposes. RFD never consulted them when they demarcated the national park and it never gave them an alternative to pursue sustainable economic activities. So although they knew WFC being a jewel amongst the remaining forests in Thailand and considered as a world heritage site, they were trapped by not giving any alternatives to support the conservation of the WFC.

The development objective of the Project, is therefore, considered relevant in that perspective. However, looking at the HMD EE Project only, it is considered doubtful whether the immediate objective by itself will contribute significantly to the achievement of the development objective. The immediate objective of improving the environmental knowledge, attitudes and skills of key stakeholders through the pilot project is considered important by itself.

Assessment of main outputs: A training center has been established at the Huay Mae Dee Ranger Station within the Huay Kha Khaeng Wildlife Sanctuary which seems to be functioning well. This Project has contributed by establishing accommodation facilities, water system and generator. However, the generator is too noisy and scares away wild animals.

The training activities are assessed being of high quality. The teachers training course of one week's duration is considered to be very useful to integrate environmental issue into their curriculum. However, many teachers expressed the desire for refresher courses after having implemented what they learnt in their initial training. It is considered highly useful to have a brief refreshing course based on the practical experiences the teachers have acquired after their initial training.

Educational materials

There are two kinds of materials used in the training and outreach activities, namely, the reading materials and the learning materials.

Reading materials were prepared for the trainees. These materials consisted of several short articles on relevant environmental

issues. The contents were arranged in line with different training courses. For example, the first and second units deal with basic knowledge about the natural resources and environment; the third unit deals with environmental education for a community; the forth unit focuses



Mr Than making his presentaion.

on youth camps and environmental conservation; and the fifth unit is concerned with utilization of media for the promotion of environmental awareness.

Learning materials: The Project produced some learning materials in different forms such as videos, posters and audiotapes for use in training and outreach activities.

Outreach activities: Besides the establishment of six model schools, other environmentally activities such as organic and integrated farming, producing food for the school lunch program, waste segregation and recycling, beautification of the school environment, environmental clubs and competitions were also carried out in the community.

Conclusion

In conclusion, the Project has produced most of its expected outputs of high quality and contributed to the achievement of the immediate objective. As mentioned above it was expected that this immediate objective would be the basis for the achievement of the development objective. However, the Project contributed well towards the development objective, at least by facilitating communication between various stakeholders in the Project. Through training, communication and conflict resolution, the ground was prepared for a more conserted effort to conserve the WFC. In this sense the Project, through public participation, is contributing to the ongoing awareness raising process.

On the basis of the experiences and outputs of the Project, it can be said that the conservation of WFC should take the following course.

- 1. Provide training to forest rangers on environmental education so that they can conduct outreach activities in local communities and organize nature study for schoolchildren and the general public around their stations.
- 2. Build environmental knowledge, understanding and skills of the community leaders and monks so that they can lead the community in various conservation activities. It is also essential that the local Tombon Administration Organizations make efforts to include policies, plans and strategies to stimulate awareness about environmental management in the community.
- 3. Support the inclusion of conservation issues into the school curricula and the integration of environment into the existing courses through teacher-training and learner-centered approaches of education.
- 4. Request the support of local media to help promote the dissemination of conservation knowledge.
- 5. Compile and summarize lessons learned for wider dissemination.

THAILAND

Awareness Campaign for Stakeholders in the Ramsar Site

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Summary: Thailand became a Contracting Party to the Ramsar Convention on 13 May 1998. Thailand's first Wetland of International Importance to have been officially established as a Ramsar Site is Khuan Kee Sian, a swamp forest site adjacent to Thale Noi. Thale Noi is a freshwater lake in the south of Thailand. The first phase of designation started with a small area (493.6 ha) in the existing Thale Noi Non-Hunting Area, but it is envisaged that the Ramsar site will be eventually extended to cover the entire non-hunting area.

The sustainability of wetland conservation and management approaches at Thale Noi will depend on the public awareness and understanding on the values of the wetlands especially by local communities, other users and the government.

This paper describes public awareness campaigns for stakeholders at the Thale Noi Non-Hunting Area, carried out by Wetlands International-Thailand Program during 2000-2002. Its purpose is to enhance their understanding of direct and indirect values and benefits of the lake's resources. The activities target a wide range of groups in the area using different educational approach, methods and materials.

Introduction

The Ramsar Convention on Wetlands is an intergovernmental treaty on wetlands that was adopted on 2 February 1971 in the Iranian City of Ramsar. Officially known as "The Convention on Wetlands of International Importance especially as Waterfowl Habitat" the treaty aims at international cooperation in the conservation and wise use of wetlands safeguarding the biodiversity resources and supporting functions of wetlands around the world. The Convention came into force in 1975 and now has 134 Contracting Parties in all parts of the world. Approximately 1,005 wetlands have been designated as "Wetlands of International Importance" (also known as Ramsar Sites), covering 71.7 million hectares.

Thailand became a Contracting Party to the Ramsar Convention on 13 May 1998. Thailand's first Wetland of International Importance to have been officially established as a Ramsar Site is Khuan Kee Sian, a swamp forest site adjacent to Thale Noi, a freshwater lake in the south of Thailand. The first phase of designation started with a small area (493.6 ha) in the existing Thale Noi Non-Hunting Area, but it is envisaged that the Ramsar site will be eventually extended to cover the entire Non-Hunting Area. In becoming a ratified member to the Ramsar Convention, the Thai Government has demonstrated its commitment to the conservation and wise use of wetlands. Through the nomination of Khuan Kee Sian as the country's first Ramsar Site, the government has shown that it takes its responsibilities of protecting the ecology of the Thale Noi area, and is seeking international cooperation safeguarding the site.

Thale Noi (literally meaning 'small sea') is roughly a circular lake of 5 km in diameter, situated approximately 1 km north of Thale Luang in Patthalung Province, southern Thailand. The area of open water occupies 2,673 ha, and is covered with floating or shallow rooted aquatic vegetation (Jintanugool and Round, 1989; Parr, 1995). Khuan Kee Sian is located in the *Melaleuca* swamp forests north of the lake, and was chosen as the first Ramsar site for its major importance as nesting and roosting site for waterbirds. For the people living around Thale Noi, the wetlands provide many of the local requirements for daily life, such as water supply, timber and other plant products as well as other valuable services including flood and erosion control, sediment trapping and maintenance of water quality. Unfortunately, many of these natural values are often poorly recognised. Consequently, the wetlands of Thale Noi have been degraded and converted to other uses, for example by the clearance of *Melaleuca* for krajood cultivation (local plants used for making mats), overfishing, uncontrolled grazing and nearby drainage.

Among the threats to Thale Noi wetland is a lack of awareness and coordination among government agencies, private sectors and others (OEPP & TEC, 1998). The Office of Environmental Policy and Planning (OEPP), the government agency in Thailand responsible for the planning and implementation of Ramsar issues, serves as the Secretariat for the National Wetland Committee. The Secretariat approached Wetlands International to develop a public awareness campaign on wetland benefits and the Ramsar site, Thale Noi. Such a campaign will be an important first step towards the appropriate management of Thailand's first Ramsar site. The proposed campaign will encourage a two-way flow of information, enabling people to receive as well as contribute ideas and information.

The sustainability of wetland management approaches at Thale Noi will depend on the understanding and support of the local communities and local administration. An extensive public awareness campaign would therefore be appropriate as a tool to bring the message concerning wetland conservation and wise use to the various stakeholders in the area. This campaign should enhance their understanding of the many direct and indirect values and benefits derived from the wetlands. The campaign will at the same time allow for dissemination of information about the Ramsar Convention and the direct and indirect consequences of the nomination of Khuan Kee Sian as a Ramsar Site for their livelihood. The proposed project is targetted at a range of stakeholders, including local communities, local administration, local government officials, school teachers, children, Non-Hunting Area field staff, boat operators, local environmental NGOs, media, visitors and general public. In order to reach out to this wide range of stakeholders, various project activities were carried out, including village outreach, study tours, exchange visits, special children's activities, workshops, events and numerous information dissemination activities.

Goal and objectives

The long term goal is to enhance awareness and build support within the Thai society for wetland conservation and the implementation of Thailand's obligations to the Ramsar Convention. Greater awareness of the direct and hidden values and functions of the wetlands at Thale Noi and the benefits of its status as a Ramsar Site will contribute to the sustainability of the wetland management approaches undertaken in this area, and facilitate the identification and designation of further Ramsar sites in the country. The specific objectives of the project are:

- To enhance general awareness on wetland benefits, values and functions among the local communities, general public and local authorities;
- To increase the understanding among the general public, local communities, authorities and other relevant stakeholders in the Thale Noi area of the Ramsar Convention and its direct consequences for the daily life of the people living at Thale Noi;
- To inform the general public and local communities of the relevant government's policies, management plans and conservation measures for the Thale Noi area;
- To provide a basis for strengthening community support and promoting people's participation in wetland conservation and management of the Ramsar site at Thale Noi (see also EMSONG, 1998).

Target groups

It is important to realise that there is a wide range of target groups in an area such as Thale Noi especially awareness-raising program, the priorities and approaches to address the needs and perceptions of any one group may differ greatly.

Initial assessment yielded the following key target groups in and around Thale Noi. They are local communities, school teachers/ children, government agencies and local administrative organization (or, Bor Tor), field Staff of the Thale Noi Non-Hunting Area, and the media. Each of these groups has been communicated with in an appropriate language, using different methods and materials.

Awareness activities

A range of awareness-raising activities have been conducted since 1990, focusing on the different target groups. Different local awareness activities were organized, some of which are included below.

- 1. Training workshops: Training workshops were organized for representatives of the local administrative organizations (Bor Tor), school teachers, and the RFD field staff on benefits, values and functions of wetlands and the Ramsar site.
- 2. Awareness seminar for the media: Some 23 local media representatives joined the yearly seminar and study tour around the lake to increase the awareness and understanding of the functions and values of wetlands for people. The seminar gave an opportunity to promote publicity of the project and the implications of the Ramsar status in the community.
- 3. Wetland youth camp: Over 178 students around Thale Noi participated in the Wetland Youth Camp. The camp consisted of slogan, poster, drawing & coloring, bird spotting contests, wetland quiz, village survey and study tour of other wetland sites.
- 4. Press release and articles in the journals: An article was published in the *Sawasdee*, an inflight Thai airline magazine highlighting of the Ramsar Convention, wetland and the Thale Noi area.
- 5. Wetland education kit: A wetland education kit was developed as a successful model produced by Wetlands International-Malaysia Program. In Thailand, the kit was developed

as a tool to teach in class as well as during excursions. The kit was developed in consultation with local schools teachers and students. The kit consists of learning modules (teacher's guide, exercises, cassette tape and board game), story book, poster on flora and fauna including fishes of Thale Noi.

- 6. Factsheet: The Ramsar Bureau's publication, *Wetland Values* and Functions was translated and printed into the Thai language. The production was adapted to provide examples from Thai situations. The publication targeted for local and provincial government, university students and teachers, middle-level managers actively involved in planning and making decision in wetland conservation.
- **7. Promotional materials:** Slides, fact sheets, posters, brochures, stickers and T-shirts were produced and distributed widely.

Conclusion

The involvement of school teachers and RFD field staff in the awareness-raising activities has ensured that the environmental education of school children in the area and visitors to Thale Noi will continue even after the project is completed. The sustainability of the awareness program will be further supported by some of the awareness tools and materials produced by the project.

The awareness programme is considered a first important step towards a successful and integrated management of the Thale Noi wetland area. Awareness-raising activities for school children and teachers will be extended to other districts and provinces in (Southern) Thailand. The establishment of a "Thale Noi Peat Swamp Forest Conservation" will also contribute to a further continuation and sustainability of these activities.

It is envisaged that Wetlands International will continue to support the RFD and local authorities in the development and implementation of a successful model-type management of the Ramsar site, drawing from experience and lessons learnt during Wetlands International's continuing involvement in the management support at Indonesia' two Ramsar sites and Malaysia's first Ramsar site. The supporting role of WI could particularly focus on effective involvement of the local administration (Or Bor tor) and people's participation in the management of the site.

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VIETNAM

Grassroots Education

Mr. Bernard O'Callaghan and Ms. Nguyen Thi Ha Nguyen Hon Mun Marine Protected Area Pilot Project

Introduction

Khanh Hoa province is situated in central-south Vietnam, with a total area of 5,258 km². The terrain of Khanh Hoa is of many types including mountain and coastal areas. The coast line of Khanh Hoa Province has some 9 wetland types, which are presented in Table 1.

TYPES	VAN PHONG BAY	NHA TRANG BAY	CAM RANH BAY	NHA PHU LAGOON	THUY TRIEU LAGOON
River mouth littoral	100 -140	80 -100	200	500	20 - 50
Mangrove	60	100 - 150	50	800 - 1,000	80 - 100
Sandy, sandy-					
mud littoral	1200 - 1500	120 - 150	1000 - 2000	500 - 700	1000 - 1400
Rock littoral	700 - 1000	1000 - 1200	500 - 700	80 - 100	
Dead coral littoral	400 - 600	200	367	40 - 60	
Hard rock covered					
by live coral	600 - 1000	800 - 1000			
Aquaculture ponds	450	800	1000 - 1200	800 - 1200	500 - 700
Salt bed	200 - 250		200 - 300	50 - 70	20

Table 1: Wetland Types and Area Coverage in Khanh Hoa Province (in hectare)

Within these wetland types, Khanh Hoa Province has got some beautiful beaches such as Hon Mun-Nha Trang Bay, Doc let and Van Phong lagoon that attract domestic visitors as well as tourists.

In this report, the authors present the status of the Hon Mun Marine Protected Area, its management plans and some strategies on education.



▶ Ms. Nguyen sharing her new experiences on marine education (Photo: A. Yonezawa)

Hon Mun Marine Protected Area

The Hon Mun Marine Protected Area (MPA) is situated offshore from the coastal resort area of Nha Trang Bay in Khanh Hoa Province. It covers the total area of 160 km². It encompasses nine islands (Hon Tre, Hon Noc, Hon Mun, Hon Rom, Hon Vung, Hon Cau, Hon Mot, Hon Tam and Hon Mieu).

The Hon Mun MPA in Nha Trang Bay is famous for its biodiversity which comprise 390 species of corals (including hard coral, soft coral and horn coral), 222 species of fish, 106 species of mollusks, 18 species of echinoderms, 55 species of macro-algae, 69 species of seaweed, 7 species of sea grasses, 3 species of mangrove and 13 species of algae. Also, it provides livelihood to local people including through tourism. However, this area is under increasing pressure from, and subject to, a wide range of human and natural forces, particularly destructive fishing, predation by crown-ofthorns sea stars, haphazard anchoring, river run-off and other sources of pollution. The Hon Mun MPA supports some 5,000 villagers relying, to a large extent, on fisheries and aquaculture. Activities such as over exploitation of fish stocks, destruction of habitats from blast, poison fishing, increasing development of island resort facilities and small boats carrying tourists poses serious threats to the integrity of the area. The area has reached to a critical point to sustain its carrying capacity.

Current environmental status

Khanh Hoa Province has the coastal length of 400 km. Some marine development activities such as fishing, aquaculture, sea tourism and port services have caused some negative impacts on marine environment and coastal areas.

Nha Trang Bay is badly affected from pollution compared with other lagoons and bays in the Khanh Hoa sea area. Together with waste disposal from cities, the other sources of pollution are industrial waste, (Nha Trang Port, petrol oil port, fishing port), murky water, rubbish and tourism. Hundreds of boats transport goods, petrol, oil and tourists, along with daily fishing in Nah Trang Bay. The coastal area also has been converted into ponds for shrimp culture.

The Hon Mun MPA faces a wide range of threats and impacts, ranging from the local to regional to global levels.

At the local level

- Over-fishing, including blasting and poisoning
- Coral predation by crown-of-thorns sea stars
- Damage caused by anchor
- Damage caused by tourists & divers
- Abnormal rates of bio-erosion caused by population of seaurchins
- Coral diseases
- Water discharge and oil spills

At the regional level

- River flooding & other mainland influences
- Over-fishing by "outside" fishermen

At the regional and global levels

• Coral reef bleaching

The wetland resources of Khanh Hoa Province are generally limited and some attention has been paid to their protection through some regulations. The plan of using wetlands is limited to the ministerial and provincial levels. No attention has been paid to education and public awareness of wetland conservation and biodiversity protection in the Hon Mun MPA in Nha Trang Bay. Recently, with the support from the IUCN-World Conservation Union, World Bank, DANIDA, Ministry of Fisheries and Khanh Hoa Provincial People's Committee, the Hon Mun MPA Pilot Project has initiated environmental education and awareness programs in the Hon Mun MPA area for target groups such as local communities and overseas tourists.

Environmental education and public awareness

The links between environmental education and sustainable development are continuing to grow stronger as environmental education is becoming acknowledged as an important tool in the move towards sustainable development. Because of this, the Hon Mun MPA has developed an Environmental Education Strategy & Action Plan for its protection and management.

The target audiences of the environmental education programs are local people living in and around the protected area. These people heavily depend on the resources from the area. They are called major stakeholders. Other stakeholders include government agencies, MPA staff, school children, teachers, fishermen, military, the general public of Nha Trang, tourists, tourist operators and service providers.

In order to increase awareness, knowledge and understanding of the stakeholders about the Hon Mun MPA and its resources and benefits, the Project has developed the following materials.

- **Brochure:** Some10,000 Vietnamese and 4,000 English copies were printed in 2002.
- Newsletters: (2 issues produced). 2,500 Vietnamese and 500 English copies were distributed to stakeholders
- **Posters:** 5 posters were produced to be used for displaying at special events
- **Books:** 2 regulation booklets have been produced, one on the Hon Mun MPA temporary regulations (3,000 copies) and another on relevant existing national regulations (3,000).

- **Signboards:** 16 signboards promoting the regulations were placed in key locations in and around Hon Mun MPA
- Notebooks: 10,000 notebooks were distributed to local students and teachers with the cover pages designed to increase environmental awareness.

Besides, the Project also developed calendars, logo (designed through a competition) and educational materials appreciated recognition of the Hon Mun MPA and show activities the Hon Mun MPA is conducting at the grassroots. Logo was used on pens, folders, letterhead papers, envelopes, caps, T-shirts, polo shirts and raincoats.

The Project regularly conducts meetings and workshops with stakeholders for promoting their involvement and sharing information about the protected area and organizes a range of the Hon Mun MPA displays at three Trade Fairs, two provincial fisheries fairs and a national tourism fair in Ho Chi Minh City.

The Project has promoted the Hon Mun MPA activities and stories in the media through press releases, news from TV, radio and print media. A short video summarizing the activities of the Hon Mun MPA Pilot Project was prepared and shown to the participants of the Stakeholders Planning Workshop. The video is scheduled to be shown on TV. Two videos "Coral Wonderland" and "PADI Good Diving" have been translated and "Coral Wonderland" has been shown in villages around the Hon Mun MPA as well as show on local TV.

The Project organizes educational theatre to involve local stakeholders. A theatre show has been performed at 6 villages of the MPA area, at Vinh Nguyen Commune and at the Stakeholder Planning Workshop. Traditional songs were organized in 4 villages to collect and promote traditional knowledge. The staff of the Hun Mun MPA Project attended all the activities.

To engage students in the awareness of marine environment activities, a trial course has been conducted in Bach Dang School and ten lessons were developed. These lessons were conducted from January to May 2002. Teachers were given training to enhance their capacity to conduct environmental education activities effectively. The trained teachers have developed twenty potential lessons around ten themes.

In order to increase the involvement of stakeholders in reducing and managing waste in the Hon Mun MPA, activities such as cleanup day, biodiversity assessment and crown-of-thorns sea stars collection have been organized regularly. Other programs such as communication and capacity building activities are also organized In environmental education activities.

The Project is planning to build an Information Center within the protected area to increase the awareness and understanding of the marine environment and its values for natural and human functions.

Conclusion and lessons

After one-year of implementing activities with the assistance from the Work Bank, IUCN-The World Conservation Union, Vietnamese Government and DANIDA, the Environmental Awareness Unit of Hon Mun MPA Pilot Project developed a feasible environmental strategy and gained some initial results after its implementation. The Project implemented various environmental education programs effectively. Some lessons learnt from the Project are as follows.

- Cooperating with national and international organizations to study and exchange experience, information, and means to increase educational activities.
- Cooperating closely with local communities and border army
- Education goes together with enforcement
- Increasing environmental awareness goes together with increasing local livelihood through additional income generation activities such as handicraft and aquaculture
- Conducting environmental education for the people of all ages in the communities from the old to the young through Women's Union, Youth's Union, Young Pioneer, schools, etc.

- Conducting environmental education through village festivals and clean-up activities in the village and on the sea.
- Selecting methods of education suitable to each target group - using pictures, songs, plays, stories so that it is easy for local people to understand the educational message.

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CHAPTER 2

Perspectives on Environmental Education

Bishnu B. Bhandari
Topic: Making educational programs, environmental

Moderator: Bishnu B. Bhandari, IGES

- **Objective**: Sharing of perspectives, practical experiences, opportunities an innovation in environmental education.
- Panelists: 1) Dr. Sundari Ramakrishna, Program Director, Wetlands International-Malaysia
 - 2) Prof. Desh Bandhu, President, Indian Environment Society, India
 - Mr. Nyman Suryadiputra, Technical Director, Wetlands International-Indonesia
 - 4) Ms. Savitree Srisuk, Head, Environmental Education Unit, Department of Environmental Quality Promotion, Thailand

Modalities: The panel discussion was divided into four rounds.

- 1. In the first round, panelists were asked the common question, followed by a complimentary question.
- 2. Each panelist was asked a different question in the second round.
- 3. In the third round, panelists interacted with one another.
- 4. The floor was open for discussion in the final round.



Panelist just ready to take the floor (Photo: A. Yoneawa)

First round: Common question

How does your environmental education activity differ from that of the general education? What are the essential attributes of a successful environmental educator? Will you please share with us your own experiences?

▶ Dr. Sundari Ramakrishna: The primary goal of environmental education is to develop a population that is aware of, and concerned with, the environment and its problems. Environmental education should provide knowledge, positive attitude, skills and motivation to individuals in a way they can manifest their concern and commitment to work as an individual or as a group. It should enable them to understand the value of the ecosystems, identify the problems, find the possible ways of solving them and prevent new ones from occurrence. In short, it is a new way of looking at, and solving the problems that have surrounded us.

Having set this background and context, I would like to emphasize the point that practicing and doing environmental education should not be for money, prestige and job; rather it should be to satisfy our passion and show our strong love. In other words, it needs one's sacrifice of resources, time and energy.

Environmental education is an informal activity, where one can take the children to a wetland site for first hand observation, talking to them about wetland resources, writing articles, running demonstration sites, doing research, etc. People have different skills to distinguish between good and bad and select the right one for adoption. It is a life-long process; it is not an overnight, one-off activity. It needs a lot of investments in terms of time, energy and resources.

Follow-up question: Could you clarify how you make a distinction between environmental education and general education?

In my opinion, the main difference between general education and environmental education is that the former is more formal and students are concerned with getting the certificate and the degree,

whereas the latter is concerned with the understanding of nature and the inter-dependence between different ecosystems, man-made structures and the natural environment. In short, environmental education deals with connectivity between different organisms, both micro and macro. The organisms have survived because they are inter-dependant one another. Once their linkage is disturbed, then there will be some imbalances in the situation such as imbalance in the predator and prev relationship, the food chain and the man and nature co-existence. The invasion by, or the absence of, predators would spur new problem in the environment. So the primary purpose of environmental education is to make the participant understand this vital relationship in the environment. It should be done in informal manners. One does not have to go to the classroom to understand this relationship. It is simply going out to nature, and taking a stick and sand to draw something or do something. Just simple things such as a pen and pencil will do the job. No sophisticated thing is required.

▶ Prof. Desh Bandhu: To be a matter-of-fact educational practitioner, one has to have a clear understanding of education and environmental education. To me education prepares one to be a good citizen, whereas environmental education makes one good citizen as well as competent for the protection of the environment from irrational human actions and makes one understand the values of life systems in the universe. However, it should be noted that education is a slow learning process and its goal can not be achieved over night. To me every day is a day of learning and teaching a new thing. The concept of general education is narrow in the sense that it is bias toward individual subject such as Science, Mathematics, Geography and so forth. In general education educators give importance to the individual subject and do not attach any inter-linkage with other subjects. It suffers from the syndromes such as "Biology is the best subject; I should do something for biology; this is the principal field and so forth". Environmental education is issue-based; it looks at the issue holistically; it strives to incorporate

concerns in a whole so that it addresses the actual needs and problems of the locality. It is an integrated field of study and transdisciplinary in nature.

Environmental education also means greening of education. Primarily greening is the exercise of incorporating environmental concerns in the classroom instruction and in the textbook. Let me give an example of greening education in India. We have already started greening of textbooks for Grades 5-7. Since we do not know exactly how much of these textbooks such as of Geography, Science, Mathematics and so forth are environmental in nature, first of all it was necessary to determine the subject matter. Consequently, some 100 parameters were identified and gaps determined. Then textbooks were rewritten incorporating environmental concerns. These books have already been distributed to 100 schools identified as pilot schools. They are called green textbooks. But the process of greening has not yet been integrated into the formal education system.

Follow-up question: Would you throw some light on environmental citizenship?

Let me give you two examples from New Delhi, where we have run a campaign against the use of the plastic bag. This is a hot issue because we are telling the people not to use it, while every body is using it. Here comes the use of citizenship analyzing merits and demerits and then exercise their right judgment.

Another example is the boycotting bus, taxi and scooter that pollute the environment and encourage the use of the NG bus in New Delhi. Environmental citizenship does not work here because people have not developed the habit of refusing the taxi that pollutes to the environment because of simple two reasons. One is that there is no alternative to this means and the other is that it is the cheapest means of transportation. So, people support and use vehicles giving pollution and smog. In this way environmental citizenship does not work in reality. People are aware of it but can't adopt the new one due to the compelling situation. ▶ Mr. Nyman Suryadiputra: Let me address this issue by giving you an example of material development on environmental education in Indonesia. The process of material development is divided into three stages; (1) preparation of the material, (2) implementation, and (3) evaluation.

- Preparation of the material: The material development is a time consuming and laborious job and involves some financial resources as well. Prior to developing the material, causes of mangrove deforestation in a site were studied. The causes such as conversion into fisheries, building construction and wood collection were identified as the major problems. Thus the task of material preparation began with the focus around raising people's awareness and solving them locally. At this stage, different stakeholders were also consulted to identify the issues of their area and the relevant material was developed with their help including teachers. This is how a specific issue was identified and contents determined. It became relatively easy to decide the subject matter and draft the materials along with illustrations, sequence and wording. The material was evaluated by the expert especially in relation to appropriateness, correctness, practicality and effectiveness of the content and then printed for distribution.
- 2) Implementation: The materials were used in the training of trainers, mainly attended by teachers, NGO representatives and park managers. It was used in conjunction with the guide book.
- 3) Evaluation: The material was evaluated in term of how it brought forth the desirable skills and attitude in the participant, its effectiveness, success, etc. After the evaluation the material was printed and distributed in a mass scale.

Follow-up question: Could you elaborate the position of the local community, the direct beneficiary in the process of your material development?

For the site specific issues, we undertook survey; we talked with the people; we interviewed them; we tried to come up with some specific solution. Through discussion, we came to know that local people were asking us to find the ways to convince the local government officials.

➤ Ms. Savitree Srisuk: I strongly feel that environmental education is a process or a tool that can empower people to understand what they have been doing can affect themselves as well as the world. In other words, a simple local action can lead to a big global reaction. I am using the word "empowerment" in the sense that it allows people to know their position in relation to the local environment, let them realize their duties, responsibility and obligation; enable them to find alternative ways to mobilize resources. This assists them to get a bigger picture of the situation connecting them with their surrounding environment. In brief, empowerment means enabling them to think critically, to allow deep participation and enjoin them duties, responsibilities and obligations. It also provides an opportunity for the people to construct their knowledge and understanding about the world and make right decision to connect to the outside.

Environmental education is not like throwing a stone into the sea. Nor is it like filling up the same. But it is something to make people aware of the danger of environmental deterioration. In other words, we should awaken the people to the sea of problems that have surrounded us. They have to connect themselves with this sea and learn to live with some kind of responsibility. Teaching this responsibility is the principal task of environmental education.

For further clarification, let me give you an example from Chiang Rai Province, where the teacher tells students about the forest and then they are taken to the forest to show what has

happened there; they see the situations by their own eyes, first hand observation. They discuss the issues. After this tour, a meeting is organized between students, teachers and villagers, where the students make a presentation on what they saw and learnt; ask why it has happened; why there is a loss of animals. What will happen in the future? Will they see the animal only in the picture or book? This stimulated the parents to re-think about the future of their children. As a result, the parents began to protect the forest and thereby the establishment of community forestry in collaboration with schools, the teachers and students. The community forestry is going well. This provided the student a real opportunity to learn about the situation, not from the book but from the real life situation. Teaching them was not in the classroom, but in the world of work or the real life situation. The community forestry became the laboratory for children, teachers and parents. They can connect their life with the outside world. It is working together.

Follow-up question: Could you tell us a bit more about empowerment in the community forestry?

I mean to say that we always have to think in a positive manner. There are many ways; just we need to find out. Empowerment means explaining not only to the villagers about the community forestry but also doing the same to the government officials, politicians and other stakeholders for a better solution, for a better life, or explaining how can they learn and change their perspective. Empowerment means telling them a linkage between learning, their activities and their daily life; it means that what they learn, should not be different and separate from their daily life. In this context, it would not be out of the question to mention the concept of the word "ownership"; it is very important to realize that forest does belong not only to government but also to people. We need to tell their role and find the best ways to tackle the problem.

Second round: Specific question

▶ Dr. Sundari Ramakrishna: Wetland International- Malaysia has been successful in blending science and culture into one activity, i.e. in the work of the Wetland Education Kit Box for Tasek Bera. It is highly commendable and a lot of things can be learnt from it. I just like to ask you about how far have you been successful in integrating the gender issue in the Wetland Education Kit Box? What are your efforts to build partnership among local stakeholders? Do you have any plan to replicate the Kit in other wetland sites?

Women know more about and use more wetlands and water than men. But this fact has not been taken into consideration in the decision making process. Despite this situation, no gender issue has been addressed in the Kit. This has been recognized but not much has been done. However, this issue has been addressed seriously in the community-based eco-tourism, where an organization of boatmen and guides has been set for the *Semelai* people. Most of the members are men and only a quarter of them are women. It is not easy to solve this issue but in some communities, we have found some vocal and powerful matriarchal tradition. This is the one area we need to emphasize in the future, especially in wetland education. Concerning the other two questions, efforts are underway to involve local stakeholders and replicate the Kit in other wetland sites.

▶ Prof. Desh Bandhu: You have been successful in organizing numerous regional workshops in environmental education. I just like to know what are the key points that made you successful in getting funds from donors. How do you synergize the needs of the community and the demands of the donors?

A short comment on empowering women! Women have to be educated environmentally. They have to know their environmental rights and duties. They have to be able to put their ideas convincingly. Environmental education is the key factor to empower them from all aspects.

Concerning the successful generation of funds, it is important that one has to be very clear about what he/she is doing in the field. There are a number of ways to generate income such as charging the fee to the participants, getting the fund from outside, setting the revolving fund, sharing the expenses, asking the donors for help, etc. There are good examples of charging the fee from the participants in the conference. The conference, can simultaneously generate funds, build participant's capacity and disseminate information. One has to be tricky in getting something even out of the negative evaluation. One should do what they want and to the extent that they give you resource. Do not do more than what they have asked you to do. One should be positive and reporting should be in the way they want and should be professionally excellent. Never go to the funding agencies directly. First find out who does what kinds of job and evaluate their work. If there are any points where you can correspond with theirs and ensure that they have interest in what you have been doing, then make a cautious effort. It is just possible that they may come to you, instead of you going to them. Put powerful people in the preliminary discussion. This will create an impression that you are doing something. This will attract them to come to you. You just need to push it indirectly. These are some of my suggestions to sell your projects.

▶ Mr. Nyman Suryadiputra: NGOs are the bridge between the government and local community. Since you are working in NGO, I would like to know what efforts Wetlands International-Indonesia (WI-Indonesia), a national NGO, is doing to motivate the government, the main partners, in the incorporation of environmental concerns in the government's education policy.

WI-Indonesia came to Indonesia after the invitation of the Ministry of Forest and signed a memorandum of understanding with the Ministry. The organization has influenced the government in various ways as our relation is based on partnership. At one point, we worked directly with the Department of Forestry; we were introduced to JICA; we worked with JICA; JICA recommended WI- Indonesia to the Ministry an appropriate and capable organization in wetland conservation.

Overseas Development Assistance (ODA) has been funding us to provide training to the government officials in the country since 1992. Every year ODA provide us fund to send 25 participants to the UK for training and provide in-country training to local managers. Also the Netherlands government has contacted us to identify two government officials to the training on wetland education. This shows that we have cordial relations with the government. Due to our good working relation, it is very easy for us to invite the high ranking ministers, media and children on the World Wetlands Day (WWD).

➤ Ms. Savitree Srisuk: The government is the key player in the overall development of the country. Environmental education is no exception. How has, the Ministry of Natural Resources and Environment, is motivating stakeholders such as NGOs, CBOs, academia and professional organizations in promoting wetland education? Also, please tell us the ministry's efforts to coordinate activities with the Ministry of Education?

In the beginning we used to work ourselves directly with the school, the teacher and the head master on environmental education. Our ministry did not collaborate with the Ministry of Education. Nowadays, we collaborate with the Department of General Education, who controls over 20,000 schools. They have seen us what we have done in the schools. Since they do not have adequate resources to do this kind of works in each school, a memorandum of understanding was signed between the Department of Quality Control Promotion and the Ministry of Education. As a result, informal meetings are held between two Permanent Secretaries of these ministries about this program. This is a success leading from the bottom to the top.

Another point is that the Ministry of Education is carrying out educational reforms. The important point of this reform is to promote the inter-ministerial education in the country. This has given us another opportunity to work with them together. With regard to the works with NGOs and others, the Environmental Act of 1992 provides an opportunity to work with NGOs. In order to implement this Act, an NGO Collaboration Section has been set up in the ministry. Two years were spent to understand the mechanism of working together. It was concluded that an open policy is essential for a successful collaboration. The NGO Collaboration Section has set up an "Environment Fund" to support the activities of NGOs. The Section maintains the directory of the NGO involved in environmental activities. Every year the Department organizes "Environmental Forum" for the NGO representatives, teachers and other organizations to share their improved knowledge on the environmental management. This has been highly useful. Also the Department has been working with the Green World Foundation in environmental education.

Third round: Inter-panel interaction

▶ Dr. Sundari Ramakrishna: With regard to the issue of empowerment, the government has to do more works. The government has not even recognized the issue at least in Malaysia. The government must bring some legislation to provide some benefits to local people. For example, forest does not belong to the government; it belongs to the people because they have owned forests for centuries. People, not the government, should have rules to govern themselves. Simply by declaring their forest as a protected area is not enough to tackle the issue. Government and community need to come to a win-win situation. For example, the government can control the forest management but the people must have the right to harvest the resources. Dependence on forests and resources should be progressively less and less. This less dependence is possible only when people generate income alternatively and increase literacy to look for alternative jobs. Eco-tourism is one of the alternatives but not a solution to it; it has failed in many countries because benefit has not gone directly to the people.

▶ Prof. Desh Bandhu: So many organizations are working in the environment, they are overlapping their activities with one another and competing for scarce resources. In the name of coordination, participation and cooperation, direct interaction has been delayed, thus hampering the project activities and shortening the project life. So the issue of coordination is going a bit out of control. There should be one responsible organization in the country to handle all these matters.

▶ Mr. Nyman Suryadiputra: Environmental education should always address the key issue, i.e., the issue of people's livelihood. And only then it can be effective on the ground. WI-Indonesia has taken the issue of livelihood in the swamp peat forest management, where some seed money has been proposed to generate alternate income for the people. In return the Project enjoins the local people the responsibility of looking after the wetland site in the area.

➤ Ms. Savitree Srisuk: I just like to add one point concerning the collaboration between the Ministry of Education and the Ministry of Natural Resources and Environment. In the school, teachers always consider any activity outside the curriculum an additional burden for them. This has caused a problem in the smooth implementation of environmental education in the school. This issue has been seriously taken as the Ministry of Education is to undertake the proposed educational reforms of its policy and programs. Again here lies an opportunity to combine the strengths of each ministry to promote environmental education because the goal of these ministries is to make good citizen. Here both ministries are working together for this common goal because the Ministry of Natural Resources and Environment has resources, techniques and advice, whereas the Ministry of Education has manpower, place and other resources.

Final round: Floor discussion

At the final round, the moderator opened the floor for discussion, the summary of which is presented in what is to follow.



- 1. Although ideas and guidelines can be drawn from materials developed for other issues and places, to be effective on the ground environmental education has to be both site- and issue-specific.
- 2. The Ministry of Education should be entrusted with the responsibility of preparing high level manpower whereas the Ministry of the Environment and other relevant ministries should plan to produce low and medium level skilled manpower. Likewise the Ministry of Health also should be involved in environmental education.
- 3. Involving local community along with political leaders is the key to the success of informal environmental education.
- 4. Environmental education is happening on a voluntary basis and efforts should be geared to train manpower at the tertiary level.
- 5. Agricultural environment should also be taken into consideration when planning environmental education.
- 6. Only primary and secondary schools are not enough to promote environmental education. Grassroots organizations should also be encouraged to reach out to informal sectors. Environmental education has suffered a lot because of lack of organizations at the grassroots.
- 7. Environmental awareness is informal education for raising public awareness whereas environmental education is a formal educational activity.
- 8. Environmental education is an evolving concept and attempts to capture an essence of sustainable development; it is a new approach to education; it should deal with the interface of economy, environment and social equity; it should always be practical, issue-based and participatory in nature.

The moderator, thanking all panelists and participants for their active participation in the discussion, adjourned the discussion expressing the hopes that the discussion has been successful to give different perspectives on environmental education to the participants.

CHAPTER 3

Communitybased Educational Package¹

Bishnu B. Bhandari

¹ The earlier version of this package was discussed at the regular meetings of the Project and in-house seminars organized by IGES on various occasions and the revised version was discussed at the Workshop on the Evaluation of Educational Materials held at Bangkok, Thailand from 7-9 January 2003. The author would like to express his deep gratitude to all for their precious suggestions.

About the material

Welcome to this package of educational materials.

The package is prepared for promoting community awareness and action on the conservation and management of wetlands and wetland resources.

The package has four modules targeted for different groups of people in a community. These are,

- Module 1: Let us keep our wetland healthy
- Module 2: What is happening to our freshwater resources?
- Module 3: Developing objective-oriented program
- Module 4: Participatory rural appraisal (PRA)

This package and its modules are based on the two assumptions.

1. Environmental problems are a common concern, the solution of which requires the active and responsible involvement of the entire community.

Explanation: A community consists of diverse groups of people. They have different viewpoints on the community problem. Some know the problem fully while others may not know it at all, or know it only partially. Similarly, some may be highly vulnerable to the problem, while others may



Community at action in Cambodia (Photo: M. Takahashi) be only partially vulnerable, or not at all. In order to tackle this common problem, the concerns and needs of these groups should be addressed fully.

So, identify stakeholders of the community (students, parents, teachers, local leaders, NGO representatives, etc.).

2. The collective action is possible only when all stakeholders of a community develop a clear common understanding about the issue.

Explanation: Different groups should be brought together; they should be made aware of. Once they realize the situation, they need to be taught in a way they develop the common understanding about the issue, particularly managing and tackling them jointly. For this, the following steps are proposed.

- a) Learn (L) about the issue thoroughly
- b) Experience and evaluate (E) the knowledge
- c) Adapt (A) the knowledge for your community
- d) Promote (P) the knowledge

This is what has been called the LEAP method, which represents the first letter of the sequence of the "Learn, Experience and Evaluate, Adapt and Promote" steps. A short description of each step is given below.

Step 1: (L) Learn about the issue thoroughly

Before putting them into action, participants should understand the issue and be fully aware of it, especially its nature, scope, context, responsible factors and its possible solution. But participants cannot do it without any guidance. Here lies the responsibility of a facilitator. Only an informed facilitator can pass the information effectively on to the participants.

Taking these things into consideration, materials on different topics have been put together in a simple way. The facilitator should read it carefully and understand the issue thoroughly. Then he/she should teach participants with the help of the teaching outline annexed.

Step 2: (E) Experience and evaluate the knowledge

Once the participants understand the matter thoroughly, they should be given the chance to apply their new knowledge in the real world of work. The direct and first hand experience facilitates them to integrate theory into practice. The hands-on experience enables them to evaluate the topic in terms of its practicality, replication and sustainability. In fact, this step is crucial to participants to make any decision on whether to take the issue seriously or drop it off completely. Participants gain the first-hand experience while applying the knowledge in the real life situation.

Step 3: (A) Adapt the knowledge for your community

The knowledge and skills will be in limbo if they are not used. They will be stagnant and become a dead wood. The knowledge should be lively and living by using time and again. Participants should think of a site, where they can adapt it so that the acquisition becomes a regular practice.

Step 4: (P) Promote the knowledge

The knowledge should not be confined to the facilitator and the participants only. They should, in turn, share their knowledge with others until the idea becomes integrated into the practice. The knowledge should be disseminated as much as possible. Participants have to build up the capacity of the community to retain, use and promote the knowledge.

Tips for the facilitator

Who can be the facilitator? A teacher, NGO representative, social worker or researcher having an interest in the conservation of wetlands can be a facilitator. The main function of the facilitator is



to impart knowledge and skills to the participant. Prior to the use of this material, the facilitator should read and understand the intention of this package.

- 1. Read the material and understand the basic concept of the issue thoroughly.
- 2. Understand the expectations and experiences of each participant at the beginning of the session. This will enable you to plan your activities for the session.
- 3. Conduct the session at or near the site as far as possible so that you will be able to deal with the real world. Use local examples, resources and hands-on experiences. Let them use their all six senses.
- 4. Use the teaching outline included in the module. This has been provided to help the facilitator concentrate on how to present the materials to participants.
- Try to use the problem-solving methods of teaching such as demonstration, field visit, issue-based discussion, etc. in a way participants get a maximum opportunity in hands-on activities.
- 6. Guide participants to develop a plan of action on the application as well as dissemination of the knowledge in the community.

Should you have any comments or suggestions on this package and its modules, please send them to the following address.

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Phone: +81-46-855-3842 Fax: +81-46-855-3809 E-mail: bhandari@iges.or.jp A wetland is any place, where people can get their feet wet without being able to swim.

• A Scientist

MODULE 1

Let-us Keep Our Wetlands Healthy

Why this module?

Wetlands occur everywhere on the Earth. A good wetland signifies a balanced ecosystem because it is the interface of land, water and air. Wetlands provide food and habitat for terrestrial, aquatic, amphibian and avian animals. So wetlands are an important place. But they are being lost due to natural as well as human actions. The loss of wetlands should be stopped and prevented. This is why this module has been developed.

- Issue: Maintaining wetland ecosystem
- **Target**: High school students. The material would also be beneficial to policy makers, decision makers, plan formulators and others at all levels.
- **Objective**: To acquaint the participant with the basic ideas of wetlands, their current status and some ways to use them wisely.
- **Demonstrated ability:** At the end of the instruction the participant should be able to discuss, describe and explain major concepts of wise use and management of wetland and their resources.

Part 1: What is wetland? Part 2: Types of wetlands Part 3: Why conserve wetlands Part 4: How can we safeguard wetlands?

Step 1: Learn about the issue thoroughly

The topic is organized into four parts; (1) what is wetland? (2) types of wetlands, (3) why conserve wetlands, and (4) how can we safeguard wetlands?

PART 1: What is wetland?

The term "wetland" is made up of two words; **wet** and **land**. The word "**wet**" means something moist, denoting the quality of being, or containing water or liquid. The word "**land**" means a solid or specific part of the Earth surface, not covered by water.

Wetlands occur where the water table is at, or near the surface of the land, on where the land is covered by shallow water.

It is a singular noun but used generally in a plural form. It appeared, for the first time, in the **Oxford Dictionary in the 1980's**.

Wetlands are as varied as the landscapes in which they occur - hence their myriad names.

As they take different forms under different conditions, some of which include: (1) marsh, (2) swamp, (3) fen, (4) mire, (5) bog, (6) lake or pond (7) slough, (8) peat, (9) bayous, (11) wet meadow (12) pecosin, (13) muskeg (14) floodplain (15) mudflat (16) polders, and (17) bottomland.

Wetlands are a vital water resource. Water is the key controlling factor.

Wetlands accounts for roughly 6% of the earth's land surface, covering an area of about 5.7 million $\rm km^2$.



Marine wetland, Isshiki Beach in Kanagawa, Japan (Photo: B. Bhandari)

Concerning the meaning of wetlands, a scientist once proposed a definition, which may be very basic but still manages to make sense.

A wetland is any place, where people can get their feet wet without being able to swim.

The Ramsar Convention on Wetlands has defined wetlands as

"areas of marsh, fen, peatland or water, whether natural or artificial, permanent or temporary, with water that is static or flowing, fresh, brackish or salt, including areas of marine water, the depth of which at low tide does not exceed six meters." The definition also incorporates reparian and coastal zones adjacent to the wetlands



 Mangrove swamp in Thailand (Photo: B. Bhandari)

 Scientists at field visit to a mangrove swamp in Thailand. (Photo: B. Bhandari)



Part 2. Types of wetlands

Commonly, wetlands are classified as follows.

- Marine wetlands: coastal areas, lagoons, coral reefs and rocky shores
- Estuarine wetlands: deltas, tidal marshes, mangrove swamps
- Lacustrine wetlands: wetlands associated with lakes and ponds
- **Palustrine wetlands**: marsh, swamp and bog. Marshes are also called slow water dams. They are like huge sponges absorbing water during the wet season and releasing it slowly during the dry season.
- Riverine wetlands: wetlands along rivers and streams
- Human-made wetlands: fish ponds, canal, irrigated lands, rice paddies, salt pans and reservoirs.



➡ Tidal marsh in South Korea (Source: The Path to Success, IGES 2002)



▶ Eco-tourism at Begnash Tal in Nepal (Photo: B. Bhandari)

Part 3. Why conserve wetlands?

A. Wetlands are the cradles of biodiversity

Wetlands are amongst the Earth's most productive environment. The main peculiarity of wetlands is their extra-ordinary diversity, which makes them not only ecologically very rich and varied but also very productive from biological and economic point of views. Wetlands occur in every country, from the Tundra to the Tropics.

- 1. Wetlands have been described as the **kidneys of the landscape** because of functions they perform in the hydrological and chemical cycles.
- 2. Wetlands are called the **biological supermarket** because they support the extensive food webs, water and biodiversity.
- 3. Wetlands are **natural engineer** because they regulate floods.

Wetlands support high concentration of birds, mammals, reptiles, amphibians, fish and invertebrates. Of the 20,000 species of fish in the world, more than 40% live in freshwater wetlands.

Wetlands are storehouse of plant genes such as wild rice, fruits, vegetables and herbs.



 Examples of marsh wetlands from Nepal



(Photo: B. Bhandari)

B. Humans receive so many benefits from wetlands

Benefits are commonly known as goods (services or values) that are obtained (derived) from the use. The benefits can be divided into four groups.

- 1) **Direct use value** is the value derived directly from the use (utilization, or interaction) of a wetland's resources and services such as the value of fish catches.
- 2) **Indirect use value** is called functions by economists. It means that a wetland potentially or actually supports (or protects) human activity or natural system without being used directly as for examples, nutrient cycling, biodiversity productivity, groundwater discharge, flood control, etc.
- 3) Option value: An individual may be uncertain about the future value of a wetland but believes that it may be high and current exploitation (conversion) may be irreversible. So, the development activities are delayed.
- 4) Non-use value is different from the values mentioned above. The individual places a high value on its conservation for future generation. The individual wishes to see them preserved "in their own right" because wetlands have the worth of something in themselves. It is a subjective valuation and is extremely difficult to measure. This is the reason why it is known by different names such as existence value, intrinsic value, bequest value, or attributes such as biodiversity and cultural heritage. Please see Table 1 for the specific examples of benefits of wetlands.



Riverine wetlands, Nepal
(Photo: B. Uprety)

USE VALUES		NON-USE VALUES
INDIRECT USE VALUE	OPTION VALUE	EXISTENCE VALUES
Nutrient & sediment retention	Potential future use(both direct & indirect)	Rich in biodiversity, good ha
Flood control	Future value of information	Religio-cultural heritage
Storm & erosion protection		Research & education
	USE VALUES INDIRECT USE VALUE Nutrient & sediment retention Flood control Storm & erosion protection	USE VALUES INDIRECT USE VALUE INDIRECT USE VALUE OPTION VALUE Nutrient & sediment retention Plood control Flood control Storm & erosion protection

Table 1. Types of services provided by wetlands

Source: Economic Valuation of Wetlands: A Guide to Policy Makers and Planners by Edward B. Barbier, Mike Acreman and Duncan Knowler, Ramsar Convention Bureau, 1997.

Energy (peat, hydro-power, fuel wood) Shoreline stabilization Biomass export

Carbon sink

Landscape & aesthetic value

Spiritual value

External ecosystem support Regulation of micro-climate

Groundwater recharge

Recreation & tourism

Wildlife harvesting Water supply

Transport

bitat

Unique eco-system maintaining the integrity

Source of genetic resources

Bequest value



>> Salt pan in Thailand (Photo: B. Bhandari)

C. But wetlands are being lost

Wetlands have disappeared.

Because

- 1) Wetlands have subsided or dried up gradually due to
 - over-extraction of resources including water
 - drought
 - filled-in by sediments and silts caused by flashfloods
 - natural calamities
 - Felling of the trees in the watershed area
- 2) Wetlands are being succeeded by vegetation
- 3) Wetlands are becoming smaller and smaller
 - Filling-in for building, rice paddies and other purposes
 - High nutrients caused by discharge and debris and thus no life.

4) Other reasons are

- Nature is a free gift
- Necessity and compelling situation for livelihood
- Considered wasteland and thus of low, or no priority
- Considered as the center of diseases, insects and snakes
- Feeling of common property and thus no civil responsibility.

► An example of riverine wetlands in Japan (Photo: B. Bhandari)



Despite their loss wetlands also have been created from actions such as construction of canal, dam, reservoir, hydro-power development, establishment of national park, etc. But the pace of loss outnumbers the gains of wetlands.

That is the reasons why we have to protect wetlands, and conserve and keep them healthy.



>> Rice paddies in Nepal. (Photo: B. Bhandari)

 Tharu girls in Nepal.
 The Tharu rely on wetlands. (Photo: B. Bhandari)



Part 4. How can we safeguard wetlands?

A. Are there any ways to conserve them?

Yes, there are many ways.

• Using them wisely. The wise use of wetlands is their sustainable utilization of the benefits of mankind in a way compatible with the maintenance of the natural properties of the ecosystem. The wise use of wetlands yields the greatest benefits to present generations while maintaining its potential to meet the needs and aspirations of future generations. The wise use of wetlands is the vital link between (1) water supply, (2) sustainable development and (3) poverty eradication.

- Using only the interest, not the principle. Take only the services from wetlands; do not destroy them. Wetlands are like the geese that lays golden eggs. We should protect the geese for golden eggs.
- Maintaining symbiotic relationship like the one between the bee and the tree. The bee takes only nectar from the tree without harming it.
- **Plan the wise use of wetlands**. This can help alleviate poverty of the surrounding communities by;
 - i) Involving local communities
 - ii) Providing employment to local people
 - iii) Generating quick income
 - iv) Empowering women who live off wetland resources
 - v) Increasing food security
 - vi) Protecting water resources



>> Collective fishing in Nepal. (Photo: B. Bhandari)

B. Some tips to use wetlands wisely?

- 1. Adopt a policy of wetland conservation for your community.
- 2. Initiate programs such as knowledge recording, dissemination and public awareness.

- 3. Take conservation actions at the site.
 - a) Protect the source of water from activities such as felling of trees, pollution, landslide, grazing and excessive trampling.
 - b) Maintain their carrying capacity. For example, if the cause of deterioration is;
 - **From livestock grazing or trampling**, then find out how to graze livestock correctly, when, for how long, the duration of the resting period, etc.
 - From burning, then find out how to burn your wetlands correctly (e.g. frequency of burning, when to burn and how to burn, etc.).

Burning should be managed properly because it increases plant growth; it is good for grazing. Incorrectly burned wetland causes gully erosion, excessive water loss from evaporation and decreases biodiversity.

- From fuel wood, then learn how to coppice (train and prune) trees and use twigs and branches for domestic purposes.
- **From growing crops**, then avoid pesticides and fertilizers, and harvest plants sustainably.



Village meeting at Ghodaghodi Tal, Nepal (Photo: B. Bhandari)

Step 2: (E) Experience and evaluate the knowledge

Activities: Any activities that allow the participants, not only doing but also thinking and evaluating what they have learnt, should be carried out in this step.

- 1. Take participants to a wetland site for direct observation and hands-on experiences.
- 2. Pick up a plant or an animal and explain its role in the environment. Try to give a broader picture of the situation.
- 3. Show different kinds of wetland animals, plants and products.
- 4. Brainstorm on social and economic values of wetlands.
- 5. Compare and contrast the advantages and disadvantages of good and bad examples of wetland management.
- 6. Show direct and indirect benefits of wetlands to the community.

Method (s)

- 1. Split the group into smaller ones and ask them to explore on a certain topic.
- 2. Organize a group visit to the site.
- 3. Let them write down their experiences about wetlands and their resources.
- 4. Ask them to report to the group.

Output: A practical report of what the participant observed and learnt.

Step 3: (A) Adapt the knowledge for your community

Activities: Participants should develop a plan of action for their own community under the guidance of the facilitator. They should discuss it thoroughly; look at how the concept, idea and knowledge are modified.

Method (s)

- 1. Split the participants into 3-4 small groups.
- 2. Discuss about the type of wetlands they have in their community, at least one site for each group.
- 3. Discuss the ways they want to tackle the problem and issues.
- 4. Develop a tentative guideline for adapting a plan.
- 5. Regroup them for discussion and sharing experiences.

Output: A general framework for adapting a plan

Step 4: Promote the knowledge

Activities: Participants should be divided into smaller groups to discuss their individual plans on disseminating the idea and information. They should be clear about the target. The plan should be realistic and simple; it should focus on publicity, dissemination, capacity building, advocacy, empowering and others.

Output: A plan of action for dissemination

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Teaching outline (for the use of the facilitator.

Water is more critical than energy. We have alternative sources of energy. But with water there is no other choice.

• Eugene Odum

M O D U L E 2

What is Happening to Our Freshwater resources

What is happening to our freshwater resources?

Why this module: Wetlands are found in the area where a hydrological regime occurs. Its ecological character depends on spatial and temporal variation of water depth, flow patterns, water quality as well as the frequency and duration of inundation. Some wetlands like the coastal wetland and the marine wetland are often highly dependant on inputs of freshwater. The integrity of wetland ecosystems is prone to human modifications (such as abstraction, storage and diversion of water for public supply, agriculture, industry and hydropower). In this way water is an integral part of the wetland ecosystem.

- Issue: Conserving freshwater resources
- Target: High school teachers
- **Objective**: Provide the basic knowledge on the availability and sustainable management of freshwater resources
- **Demonstrated ability**: At the end of the instruction, the participant should be able to discuss, describe and explain the major concepts of sustainable management of freshwater resources.

Part 1. Concept and Availability of water Part 2: Water is a renewal resource Part 3: Why worry about freshwater resources? Part 4: Global effort

Step 1: Learn about the issue thoroughly

Part 1: Concept and Availability of water

What do we know about water?

- Physically water is a liquid.
- Chemically water is made up of two parts of hydrogen (H) and one part of oxygen (O). Its chemical formula is $H_2 + O = H_2O$.
- Water fills lakes, wells, streams and rivers.
- Water is indispensable for life.

Nature of water

- Water is a superior solvent able to dissolve a large variety of compounds.
- It has no shape, no color, no taste and odor.
- It is renewable.
- It is the only natural resource found in all forms; **solid**, **liquid** and **gas**.
- It expands when it freezes. Water, unlike other resources, decreases its volume when cooled down, but increases from 40 to 00 Celsius. That is why water pipes get burst when water freezes below 40 Celsius.

Importance and benefits: Water practically occurs everywhere. It is an essential element for life and called the bloodstream of biospheres. Research works have shown that

- A human being has about 65 % water in the body.
- A tree is 60 % water by weight.
- A jellyfish has more than 90 % water.



• About 2000 liters of water is needed to produce a kilogram of rice.

Water is crucial to socio-economic development. The development of water resources has significantly contributed to;

- Providing food security
- Producing electricity
- Achieving economic growth
- Meeting basic needs

However, the development of water resources is not substantial and the benefits are not equally distributed among, and shared by, all players.

Benefits are of two kinds; direct and indirect. Direct benefits are called uses arising out of direct interaction with water resources. Indirect benefits are known as functions.

Direct benefits of water resources are presented in Box 1. It should be noted that agriculture uses approximately 70 % of the total freshwater.

BOX 1: DIRECT BENEFITS

- Drinking and personal use
- Domestic use
- Agricultural use
- Industrial use
- Hydro-power use
- Commercial use
- Sports and recreational use

Indirect benefits of water resources are summarized as follows.

- 1. **Health function**: Safe water is crucial for protecting the survival of a healthy population.
- 2. **Habitat function**: According to ecologists, water is essential in maintaining habitat for aquatic flora and fauna.

- IL'E
- 3. **Carrier function**: Water provides two carrier-functions such as carrying dissolved materials (hydro chemists) and the eroded materials (geographers).
- 4. **Production function**: Water provides two production-related functions, (1) plants and trees are feeding on water passing through the root zone, and (2) industries and urban societies are feeding on water passing through aquifers and rivers.
- 5. **Religious and psychological function**: Water is considered holy in major religions for cleaning, washing, offering, spiritually purifying, etc.

Theories: There are two general theories about water.

- A. Water is cheap, abundant and perpetually available.
 - Water covers about 71% of the Earth surface. The area covered by water is called hydrosphere. This is the reason why the Earth planet looks like a "blue" planet from the outer space. The rest of 29 % area is the land where we live.
 - 2. If this water were to spread evenly over the Earth surface, it would form a thick layer of 3,000 meters.
- B. Freshwater resource is precious, finite and irreplaceable.
 - Nearly 97 % of the Earth's water is found in the ocean. The ocean water is too salty for drinking and growing crops. It also cannot be used in industries except cooling. A liter of the ocean water contains 35 % salt and approximately 3.6 % solid matters.

Note: The brackish water is the mixture of freshwater and ocean water found near or at the mouth of a river.

- 2. Only 3% water is freshwater i.e., usable for living beings.In terms of accessibility, only 0.003 % of the Earth's total water is available to humans. They are easily found in lakes, rivers, streams, soil moisture, exploitable underground water and atmospheric vapor.
- 3. The rest of 2.997 % of freshwater is locked up as ice in the poles and in glaciers or in ground water i.e., too

deep and too expensive for men to extract. See Box 2 below for the summary of water available in the Earth.

Box 2: Total water in the Earth		
•	Ocean Water	97 %
•	Freshwater	3 %
	– Easily available	0.003 %
	– Not accessible	2.997 %

A simplified example : Let us assume that the Earth's water is in a tank of 100 liters.

- 1) Nearly 97 % liters is salty and unfit for use by humans, animals and plants.
- 2) Only 3 liters is available as freshwater which is good for use for humans, animals and plants but 99.9% (of 3 liters) is inaccessible i.e., too deep, too far and too expensive for our use because of their locations such as poles, glaciers and deep aquifers.
- Only 0.1% of 3 liters, or 0.003 % of total water in the tank is accessible for our use, which is about half of a teaspoon.

In a tank of 100 liters of the Earth water, only a half a spoon is accessible for our use.

Sources of freshwater: Freshwater is available from the following sources.

- Rain (rain water is a pure water but gets polluted as it travels to the Earth)
- 2) Surface (lakes, rivers, streams, wetlands, reservoirs, etc.)
- 3) Aquifers (underground water)

Pores, spaces, water saturated layers of sand, cavity, gravel or bedrock that can yield an economically significant amount of water is called aquifer. The aquifer is also called the underground lake. The aquifer is always moving slowly.

Our concern: Our main concern is freshwater because

• It is very little (only 0.003 %) of the Earth's total water, or 0.1% of total freshwater. This is the water human beings,
plants and animals use for their survival. Without water there cannot be any life.

- Its availability is not constant. Sometimes, there is too much water and sometimes there is too little water.
- Its distribution is not even and differs from one place to another (spatial) and from one time to another (temporal).

Part 2: Water is a renewal resource

Time for the replacement of waters: Scientists have been successful to provide approximate data on the distribution of water in the Earth. Table 1 indicates that water can be found in different locations. Data should be considered as indicative only, but provide the basis for other considerations. For example, lakes require 10 years to replenish their waters. However, most of the lake water is stored in a few great lakes, where the rate of exchange may be more than 10 years. One-quarter of the total lake waters is stored in Lake Baikal (Russia), Lake Tanganyika (Africa) and Lake Superior (US and Canada).

LOCATION	VOLUME KM3	TIME REQUIRED FOR
	(IN MILLION)	REPLACEMENT
Oceans	1,370	2,600 years
Groundwater	60	5,000 years
Glaciers	24	10,000 years
Lakes	0.23	10 years
Soil moisture	0.07	11 months
Vapor	0.014	10 days
Rivers	0.001	12 days
Total	1,454	

Table 1: Water resources, volumes and replacement time

Source: UNESCO-UNEP IEEP (1992:17)

Hydrological cycle: Water moves around the world from one form to another through a cyclical process. For example, liquid water

moves to vapor water (gas form) and vapor water moves to ice, solid water (solid form). The circulation of water from one form to another is called the hydrological cycle.

In other words, the hydrological cycle is a path through which water circulates in different forms in the natural environment. It is a solar energy-driven system. The hydrological cycle, as the phrase designates, has no beginning and end. It exists in an endless cycle, moving between its gas, liquid and solid forms.

The hydrological cycle is the natural method of replenishing, redistributing and purifying the world's water resources.

Explanation

- 1. When temperature rises, liquid waters from the oceans and the Earth surface (water bodies, landscapes, animals and vegetation) are evaporated as vapors into the atmosphere and later become cloud.
- 2. At cool temperature, cloud through condensation, changes into liquid form and eventually returns to the oceans and the Earth's surface in the form of precipitation

Evaporation

Evaporation is the process by which water changes into gas form.

Condensation

This is a process in which vapor (gas water) changes into liquid form.

3. Vegetation, buildings, etc. intercept some precipitation. Some move over the land surface on its journey to the ocean and create rivers, streams, lakes and wetlands. Some may infiltrate into the ground and remain there as underground water (aquifers). Some flow out as springs. Still some seep into streams, or a temporary storage like lake. And some are transported by river run-off to the ocean.

Transpiration and infiltration

Transpiration is a process in which water from plants evaporates into the atmosphere as water vapor. Infiltration is the downward movement of water through soil.

Precipitation

Precipitation is the process in which water falls from the atmosphere onto the land and water bodies in different forms (rain, hailstones, snow and sleet).

- 4. The hydrological process undergoes various phases such as evaporation, transpiration, condensation, precipitation, infiltration, storage and run-off.
- 5. It should be noted that
 - The hydrological cycle is a closed system or a plumbing system. It means that there is neither creation, nor destruction of water.
 - The cycle is run by the solar energy.
 - The total amount of water contained in each phase is virtually constant in the environment.
 - The hydrological cycle contains much more water than the water we observe as precipitation, run-off, etc.

However, the hydrological cycle is greatly affected by

- Urban areas
- Watershed deforestation
- Climate change
- Land-use and land cover change (LULC)
- Alternation in temperature
- Rate of soil infiltration
- Surface and sub-surface flow, etc.

Increasing frequencies and severity of storm and risk of flooding are occurring due to increase in the intensity, duration and quantity of precipitation.

So possible effects include (1) change in water supply, and (2) increased risk of flooding and land instability.

Part 3: Why worry about freshwater resources?

Looming water crisis: The availability of only 0.003 % freshwater, its spatial and temporal variability and its necessity for improving the quality of human life have made a looming water crisis in the



Demographically the world's population tripled and the use of renewable water resources has grown sixfold.

As a result, the situation of water crisis has shown its manifestations in two areas;

- increasing scarcity, and
- deteriorating quality

This crisis is threatening the very existence of man in the Earth.

Forces driving the water crisis

- High demand of water especially safe drinking water
- Conflict over the development of the large-scale dams and groundwater resources
- Pollutions due to discharge, radiation, contamination and natural calamity.
- Forces such as temporal and spatial variability and acid rain deposition accentuated by climate change.

All these forces have caused a looming water crisis in the world.

Any way to get out of this crisis? Yes, there are some outlets. It is not late, yet.

- 1) The availability of freshwater resources is adequate enough globally to meet our current and foreseeable needs if they are managed and developed in a sustainable manner.
- 2) The present water crisis is a crisis of governance not one of scarcity. The scarcity of water is a relative concept that should be addressed seriously by taking a cross-sectoral perspective such as looking at a basket of factors socio-economic, institutional and technical.

However, managing water resources sustainably is not an easy task. It is rather a complex one. The "business as usual" approach is

not enough. A U-turn needs to be taken. That is to say, a radical approach of "*water is every body's business*" should be adopted. Managing water is a shared business requiring responsible involvement and participation of each and every actor. This approach enables poor people to improve their livelihoods and reduce their vulnerability. So, we must manage our freshwater resources sustainably, if we want to get out of this looming water crisis.

Sustainable management

Sustainable management of freshwater is the human use of water in a way that yields optimum benefits to present generations, while maintaining its potentials to meet the needs of future generations.

As a citizen, how can you contribute? This module provides you an idea to assess the situation of freshwater resources in your community. Because the problems you are facing in your community are real ones. And they need to be solved immediately because they are bothering you and your community.

So, you can do something to improve the situation of freshwater resources in your community. You may begin your mission by concentrating your efforts on the following.

- Go around your own community to get the first hand experience of water situation.
- Learn the management system of water resources from knowledgeable persons and concerned agencies.
- Organize roundtables and PRA (participatory rural appraisals) on the status of freshwater resources.
- Develop participatory plans using local knowledge, skills and resources with a common goal but differentiated responsibilities.

Part 4: Global efforts

Global efforts are underway on the improved management and development of freshwater resources. Major ones are briefly given below. **United Nation (UN)** organized the first water conference in 1977 and developed an action plan on the improved management and development of water resources. And, UN has designated 2003 as the International Year of Freshwater. Its objectives are to;

- Increase awareness of the importance of sustainable freshwater use, management and protection.
- Provide an opportunity to accelerate the implementation of the principles of integrated water resources management.
- Use the Year as a platform for promoting existing activity and spearheading new initiatives in water resources at the international, regional and national levels.
- Launch the World Water Development Report at the third World Water Forum in Kyoto.

UN also runs the World Water Assessment Program on global freshwater resources.

The World Summit on Sustainable Development (WSSD) 2002 has emphasized on the development of an integrated water resources management and water efficiency plan.

Global Water Partnership (GWP) is a network of agencies and institutions to promote "integrated water resource management" in developing countries. It facilitates the exchange of knowledge, experience and practice related to water resources management.

World Water Council (WWC) is an international think-tank for water issues. Its objective is to "increase advocacy for improved water resource management". WWC has been organizing the World Water Forum (WWF) biennially. The 3rd Forum was held in Japan in March 2003.

European Water Association act as a focal point for the exchange of information related to water and water activities.

Step 2: Experience and evaluate the knowledge

Activities: Any activities that allow the participants, not only doing but also thinking and evaluating what they have learnt, should be carried out in this step.

- 1. Take participants to the sources of water for direct observation and hands-on experiences.
- 2. Select a watershed area and initiate the discussion on freshwater resources.
- 3. Brainstorm on social and economic values of water resources.
- 4. Compare and contrast the advantages and disadvantages of good and bad examples of freshwater resource management.
- 5. Show direct and indirect benefits of water resources to the community.

Method (s)

- 1. Split the group into smaller ones and ask them to explore on a certain topic.
- 2. Organize a group visit to the site.
- 3. Let them write down their experiences about water sources.
- 4. Ask them to report to the group.

Output: A practical report of what the participant observed and learnt.

Step 3: (A) Adapt the knowledge for your community

Activities: Participants should develop a plan of action for their own community under the guidance of the facilitator. They should discuss it thoroughly; look at how the concept, idea and knowledge are modified.

Method (s)

- 1. Split the participants into 3-4 small groups.
- 2. Discuss about the type of water-managed systems they have

in their community, at least one site for each group.

- 3. Discuss the ways they want to tackle the problem and issues.
- 4. Develop a tentative guideline for adapting a plan.
- 5. Regroup them for discussion and sharing experiences.

Output: A general framework for adapting a plan

Step 4: Promote the knowledge

Activities: Participants should be divided into smaller groups to discuss their individual plans on disseminating the idea and information. They should be clear about the target. The plan should be realistic and simple; it should focus on publicity, dissemination, capacity building, advocacy, empowering and others.

Output: A plan of action for dissemination

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MODULE 3

Developing Objectiveoriented Program

Why this module ?

Knowing only technical aspect of a problem is not enough to get the solution. Equally important is the social science aspect of the solution. In other words, the participant should know some management skills such as making a good program, implementing it effectively, allocation of resources based on priority and so forth. This module attempts to provide the participant with some information required for developing a good program.

- Issue: Efficient use of resources
- Target: NGOs,CBOs and local organizations
- **Objective**: To enable the participant to develop a grassroots conservation program systematically.
- **Demonstrated ability**: At the end of the instruction the participant should be able to discuss, describe and explain major concepts of program planning & its reconsiderations.

Part 1. Why a planned program? Part 2: Importance of a program Part 3: Different approaches of planning Part 4: How can we develop a good program?

Step 1: Learn about the issue thoroughly

The module has been divided into four parts; (1) why a planned program, (2) importance of a good program, (3) different approaches of planning, and (4) how can we develop a good program?

Part 1. Why a planned program?

There are always great ideas around us. These ideas are sometimes spontaneous. Sometimes they spring out of our enthusiasm. And sometimes they come out of our desire to do a good job.

Some people simply go ahead with the "action" while others take time to plan and act. Some do not care about these ideas. Without a planning, ideas cannot be translated easily into actions. If acted, failure is bound to occur and thus a great loss of time, energy, resources, etc.

Also, actions may fail, or may not complete, if there is;

- Lack of money
- Lack of manpower
- Lack of resources
- Lack of time

In order to realize good ideas, it is important to plan activities and resources properly. That is why a good program is a pre-requisite to success.

A good program

- Is a guideline to get the things done
- Is a road map (a compass or a blueprint) to reach the end point
- Is a systematic document answering basic questions related to 6Ws (**what, why, who, how, where and when**. See the Box 1 for six helpers).
- Should consist of a clear goal statement, needed resources, schedules, risk aversion measures and even alternatives. It should also state the target and the place, where it is going to be implemented.

A good program should have the following qualifications, in short, called SMART which stands for,

 \mathbf{S} = specific

- M = measurable
- A = achievable
- \mathbf{R} = realistic
- \mathbf{T} = Time- bound



Box 1: Six helpers

- 1. What is a program?
 - · What is the issue or the problem?
 - · What are its aim and objectives?
 - · What are its expected outcomes?
 - · What will its impact be?
 - · What resources do we have?
- 2. Why is the program needed?
 - Justification
 - · Significance
 - · Advantages
 - · Intended use
- 3. Who will do and who will be the beneficiary?
 - \cdot Who is the responsible person?
 - · Who are the stakeholders?
 - · Who are the target groups?
 - \cdot Who are the people affected by the program?
 - · Who are the beneficiaries?
- 4. How will the program be undertaken?
 - · Approach
 - Method
 - $\cdot \, \text{Tools}$
 - Techniques
 - Indicators of success
- 5. Where will the program be executed?
- 6. When will the program be completed?
 - · How much time is required?

Part 2. Importance of a program

A program;

• Helps us do things systematically such as monitoring and evaluation, minimizing risks, focusing activities, meeting deadlines and schedules, utilizing resources, etc.



- Is the recorded evidence of our determination to do something.
- Enhances the confidence of those who are committed to do something.
- Serves as a strategic means to receive active cooperation and collaboration of stakeholders and target groups.

So, ideally a good program helps us;

- Identify the problem, objectives, opportunities and threats
- Evaluate the end results
- Plan follow-on activities
- Implement the program and re-plan it, if necessary

Box 2: Difference between a program and a project

Usually these two terms are used synonymously. However, they are different. A *program* is a continuing, long-term activity.

A *project* is a short-term and specific activity; it has limited resources. It means any thing not done before; it has a beginning and an end. Any project is part of a program

Part 3. Different approaches of planning

There are numerous approaches of planning but the common ones are presented below.

- **Top-down approach** (initiated from the top level for the benefits of the grassroots with or without their knowledge. Their involvement is not necessary.)
- **Bottom-up approach** (initiated from the grassroots level by the concerned people for their own benefits. They may be assisted externally.)
- **Convergent approach** (using the combination of any of these approaches. It is called the middle-of-the way approach.)

We are interested in the **bottom-up approach** because this is the most common and important method adopted in the **decentralized program planning**.

In some countries, centrally controlled planning and clientoriented planning methods are in use. These methods will not be discussed here.

Part 4. How can we develop a good program?

There are many steps but planners have identified six steps. They are;

- 1) Development of a vision
- 2) Identification of the problem
- 3) Formulation of the objective
- 4) Allocation of resources
- 5) Evaluation
- 6) Reconsiderations

These six steps are presented below in the way of a cycle, the short description of each is given in the next page.



Figure 1: Conceptual framework of a planning cycle

1. Development of a vision: Vision is a dream, or an ideal stage we wish to achieve. It may be just an idea. It does not have to be practical and realistic. It is just broad and futuristic statements as

- 1. Environmentally healthy world
- 2. Sustainable future
- 3. High quality of life
- 4. Healthy population
- 5. A sustainable future
- 6. Education for all
- 7. An equitable and just society

In order to realize this vision, we should break up this big picture into simple and practical objectives.

Note: A mission is a statement of our will and determination to reach the end-point. It is a statement of our duty, obligation and responsibility.

Exercise 1

Let each participant make a vision of their life, characterize it and discuss one another.

2. Identification of the problem: The problem is a principal question that needs to be answered. It needs to be stated clearly so that all the concerned understand the meaning in the same way. A problem can be stated well if the situation, target and places are already known. One requires a thorough assessment of a situation. So, an assessment of a situation is necessary.

Assessment is a process of determining realities, opportunities and threats of the problem. It is done in order to assist the planner. It helps the planner to;

- Identify major issues or questions
- Plan and manage resources
- Know the interlinkage between variables
- Understand uncertainties and risks
- Have the knowledge about resources

The problem should be stated in a question form. The necessary information can be collected through;

- Walking in group, talking, making observation, etc.
- Organizing meetings
- Reviewing the published materials
- Conducting detailed study on a topic
- Using participatory techniques
- Making survey and study

3. Formulation of the objective: Make your end-point simple, concise and clear.

Goal is a broad statement, usually of long-range, addressing issues which have been identified as the cause of our concern. It should coincide with the philosophy of an organization.

Objective is the break up of a goal into a series of small end points (or results) that are consistent with the stated goal. The objective should always be specific, measurable, realistic and time bound.

Brainstorming is a good method of listing problems or objectives. It gives the participant an opportunity to clear doubts and questions that may arise; it supports a free and frank expression of views; it sets a pace for confidence; it gains the support of all those responsible for the achievement of the objectives.

Exercise 2

Each student should write at least five measurable objectives.

1		
2		
3		
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4. Allocation of resources: Allocation of resources is critical in planning a program. Without resources, the end point can not be achieved. It is easy to allocate resources, if we know major tasks.

What is a task?—A task is the break up of an objective expressed into many achievable ways. It should be as specific as possible. Some of the resources should be clearly mentioned in the document (see Table 1 below)

Table 1: Major tasks and resource allocation

NO	MAJOR TASK	MATERIALS NEEDED	BUDGET	TIME	RESPONSIBLE	SOME	
					PERSON	MILESTONES	
1.							
2.							
3.							
4.							

Exercise 3

Ask the participant to develop major tasks and its sub-tasks.

1.	
2.	
3.	
4.	

5. Evaluation: Evaluation is an on-going process and is done for two purposes. One is to keep check on the process such as how things are moving or being done, compliance to rules, etc. The other is evaluation, which is done to determine the following.

- Has the plan met what is said?
- What are its strengths & weaknesses?
- What are the problems it has been facing?
- What are the opportunities and threats?
- What are its recommendations?

Based on the results, the program should be re-visited and reimplemented in the future.

The simple method to evaluate a program is SWOT (strengths, weaknesses, opportunities and threats) analysis.

How do you monitor your activities?

- 1. Look at the program if every thing is going as planned.
- 2. Has the problem been solved in a participative manner?
- 3. Are the logistics going well?
- 4. How is the staff's spirit?
- 5. Are the concerned parties given due regard?
- 6. Are the consensus and confidence building activities going well?

6. Reconsiderations: The findings of the evaluation should be discussed with the concerned parties; the suggestions should be taken into account; the draft should be revised accordingly.

Step 2: (E) Experience and evaluate the knowledge

Activities: Any activities that allow the participants, not only doing but also thinking and evaluating what they have learnt, should be carried out in this step.

Method (s)

- 1. Ask the participants to write at least five clear objectives, tasks, vision, etc.
- 2. Split the group into several sub-groups and conduct brainstorming on a particular topic.
- 3. Take the participant around the community to assess their needs.
- 4. Assign each student to collect data and information on some local resource. Let them make the plan; employ the tool; and share experiences with others.
- 5. Let the participant develop a program collectively.

Step 3: (A) Adapt the knowledge for your community

Activities: Participants should develop a plan of action for their own community under the guidance of the facilitator. They should



discuss, give their inputs and thoughts and look at how the concept, idea and knowledge are modified.

Method (s)

- 1. Split the participants into 3-4 small groups.
- 2. Discuss the ways they want to tackle the problem and issues.
- 3. Develop a tentative guideline for adapting a plan.
- 4. Regroup them for discussion and sharing experiences.

Output: A general framework for adapting a plan

Step 4: Promote the knowledge

Activities: Participants should be divided into smaller groups to discuss their individual plans on disseminating the idea and information. They should be clear about target. The plan should be realistic and simple; it should focus on publicity, dissemination, capacity building, advocacy, empowering and others.

Output: A plan of action for dissemination

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Module 4

Participatory Rural Appraisal (PRA)

Why this model ?

There is a general impression that getting data is a complicated process such as formal survey, questionnaire, analysis, etc. Although there is some truth in this statement, data can also be collected from simple methods such as talking to the people, walking through the community, observation, etc. There are many ways of gathering data. This module has been included in the package to make the point that informal methods are as good and sometime better than formal methods.

- Issue: Collecting data quickly and accurately
- **Target**: Teachers, NGO representatives, researchers and practitioners
- **Objective**: To acquaint the participants with concepts and methods of the participatory rapid appraisal.
- **Demonstrated ability**: At the end of the instruction the participant should be able to discuss, describe and explain major concepts of the participatory rural appraisal and its uses in data collection.

Part1: The evolution of PRA Part 2: Principles of PRA Part 3: Good features of PRA Part 4: The menu of methods Part 5: Analysis and preparing the report Part 6: Some tips for doing PRA

Step 1: Learn about the issue thoroughly

The topic is organized into six parts; (1) evolution of PRA, (2) principles of PRA, (3) good features of PRA, (4) the menu of methods, (5) analysis and preparing reports, (6) some tips for doing PRA.

Part 1. The evolution of PRA

Participatory Rural Appraisal (PRA) is a short-cut method of data collection. It is a methodology for action research and utilizes a range of techniques. It involves local people and outsiders from different sectors and disciplines. Outsiders facilitates local people in analyzing information, practicing critical self-awareness, taking responsibility and sharing their knowledge of life and conditions to plan and to act.

PRA grew out of biases of rural development tourism- the phenomenon of the brief rural visit by the urban-based professionals – of the costs, inaccuracies and delays of large scale questionnaire surveys.

PRA provides the middle path of greater cost effectiveness between rural development tourism research (quick-and-dirty) and the tradition of academic research (lengthy-and-boring).

Part 2. Principles of PRA

Different practitioners would find different principles but most would agree to include the following.

- 1. Using optimal ignorance: this refers to the importance of knowing what it is not worth knowing. It avoids unnecessary details and irrelevant data. It does not measure more precisely than is needed. It optimizes trade off between quality, relevance, accuracy and timeliness.
- 2. Offsetting biases: especially those of rural development tourism, by being relaxed and not rushing, listening not lecturing, probing instead of passing on to the next topic, being unimposing instead of important, and seeking out the poorer people and their concerns.
- **3.** Triangulation: using more than one, and often three, sources of information to cross-check answers.

- (the)
- **4.** Learning from and with rural people: directly, on the site, and face-to-face, gaining from indigenous physical, technical and social knowledge.
- 5. Learning rapidly and progressively: with conscious exploration, flexible use of methods, opportunism, improvisation, iteration, and cross-checking, not following a blueprint program but adapting through a learning process.

Part 3. Good features of PRA

PRA has the following unique features.

- 1. Iterative: goals and objectives are modified as the team realizes what is or is not relevant. The newly generated information helps to set the agenda for the later stages of the analysis. This involves the "learning-as-you-go" principle.
- 2. Innovative: techniques are developed for particular situations depending on the skills and knowledge available.
- **3. Interactive**: the team and disciplines combine together in a way that fosters innovation and interdisciplinarity. A system perspective helps make communication easy.
- **4. Informal**: focuses on partly structured and informal interviews and discussions.
- 5. In the community: learning takes place largely in the field, or immediately after, or in the intensive workshops. Community's perspectives are used to help define difference in field conditions.

RRA and **PRA**: These two words are often used in the literature. One should know the difference.

RRA

- In Rapid Rural Appraisal (RRA), information is elicited and extracted by outsiders. In other words, people go to rural areas, obtain information, and then bring it away to process and analyze.
- 2. The information is owned by outsiders and often not shared with rural people

PRA

- In Participatory Rural Appraisal (PRA) information is owned and shared by local people. Outsiders (professionals) go to rural areas, but they facilitate rural people in collection, presentation and analysis of information by themselves.
- 2. The information is owned by rural people but usually shared with outsiders.

Part 4. The menu of methods

There are seven major techniques used in PRA.

- 1. Secondary data reviews: books, files, reports, news articles, maps, etc.
- 2. Observation: direct and participant observation, wandering, DIY (do-it-yourself) activities.
- 3. Semi-structured interviews: this is an informal, guided interview session, where only some of the questions are predetermined and new questions arise during the interview, in response to answers from those interviewed. The interviewees may be (1) individual farmers or households, (2) key informants, (3) group interview, (4) community meeting, (5) chains (sequences) of interviews. The interview is conducted by a multi-disciplinary team of 2-4 persons and discussion is lead by different people in different occasions.
- **4. Analytical game**: this is a quick game to find out a group's list of priorities, performances, ranking, scoring, or stratification.
- **5. Stories and portraits**: colorful description of situation, local history, trend analysis, etc.
- 6. Diagrams: maps, aerial photo, transects, seasonal calendars, Venn diagram, flow diagram, historical profiles, ethnohistory, time lines, etc.
- **7.** Workshop: Locals and outsiders are brought together to discuss the information and ideas intensively.

Part 5. Analysis and preparing the report

i. Analyzing data

- 1. It is difficult to suggest a technique of analyzing the data and information in PRA as qualitative as well as quantitative methods, are employed. Each technique has its own method of analysis.
- 2. The analysis should be kept simple; it should be related to the purpose and scope of the study. If complex data are to be used, then every effort should be made to present the findings in non-technical language.

3. Data and information should be arranged according to category, issue, topic, sub-topic or question.

For qualitative method

Categorization (grouping) of data should be done. And data should be analyzed according to category. The category should be inclusive and mutually exclusive. Data could be coded according to inductive category (for open-ended questions) and deductive category (such as farmer, farm worker, non-farmer, etc.).

For quantitative method

Simple statistical techniques such as mean, mode and median (measures of central tendency) range, variance and standard deviation, frequencies and percentage can be used. Also, Pearson's coefficient of correlation, chi square, multivariate regression and t-test can be employed.

ii. Presenting the report

- 1. Include some products of field activities such as output of analytical game, box for good examples, pictures or graphs when necessary.
- Follow the sequence of Field Note >> Fine Note >> Final Note.
- 3. At the end of the day, all team members sit together and consolidate the field notes into a fine note (detailed, clearly written and consolidated field note). The fine note should be the basis for further discussion, analysis and report preparation.
- 4. The fine note could be structured in the *chronological order* (if detail is needed), or according to the *topic* (if time constraints) or according to the *question*.
- 5. The report should consist of the following.
 - The problem statement (including the conceptual framework)

- Purpose and scope
- Methodology
- Data and findings
- Implications of findings
- Summary
- Reference and appendices

Part 6. Some tips for doing PRA

It is easier to give advice than to take it. So one has to be cautious. Here is a personal list of some practical tips

- 1. Do not lecture. Look, listen and learn.
- 2. Facilitate; do not dominate; do not interrupt or interfere; once a task is initiated, let people get on with it; give them time to think or discuss among themselves.
- 3. Embrace error. We all make mistakes, and do things badly sometimes. Never mind. Do not hide it. Share it.
- 4. Try to obtain opinions from all groups.
- 5. Relax, do not rush.
- 6. Meet people when it suits them.
- 7. Use six helpers what, why, who, how where, and when.

Step 2: (E) Experience and evaluate the knowledge

Activities: Any activities that allow the participants not only doing but also thinking and evaluating what they have learnt, should be carried out in this step.

- 1. Ask the participants to collect data using different techniques of PRA.
- 2. Demonstrate how to analyze data and information.
- 3. Conduct observation to study the social and economic values of local forest.
- 4. Brainstorm on the ways to conduct the bottom-up approach of planning process.
- 5. Undertake a semi-interview on the effectiveness of this material.

Method (s)

- 1. Split the group into smaller ones and ask them to explore on a certain topic.
- 2. Work on one technique.
- 3. Let them write down their experiences about PRA techniques.
- 4. Ask them to report to the group.

Output: A practical report of what the participant observed and learnt.

Step 3: (A) Adapt the knowledge for your community

Activities: Participants should develop a plan of action for their own community under the guidance of the facilitator. They should discuss it thoroughly and look at how the concept, idea and knowledge are modified.

Method (s)

- 1. Split the participants into 3-4 small groups.
- 2. Discuss about the type of wetlands they have in their community, at least one site for each group.
- 3. Discuss the ways they want to tackle the problem and issues.
- 4. Develop a tentative guideline for adapting plan.
- 5. Regroup them for discussion and sharing experiences.

Output: A general framework for adapting a plan

Step 4: Promote the knowledge

Activities: Participants should be divided into smaller groups to discuss their individual plans on disseminating the idea and information. They should be clear about the target. The plan should be realistic and simple; it should focus on publicity, dissemination, capacity building, advocacy, empowering and others.

Output: A plan of action for dissemination



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CHAPTER 4

Visual and Views



Wetlands should be integrated into the formal education system (Photo: A.Yonezawa)



The module should have some exercises and questions at the end. (Photo: A.Yonezawa)



► In PRA the facilitator should speak the people's language. People are shy and not responsive in the beginning. (Photo: A.Yonezawa).



Module one should have more information on economic, social and cultural values of wetlands. (Photo: A.Yonezawa)



➤ Local action should always be connected with the global one. (Photo: A.Yonezawa)

Capturing the essence of sustainable development is the goal of environmental education. EE is moving towards education for sustainable development (ESD). (Photo: A.Yonezawa)







➤ Most of the case studies are funded externally. How do we maintain their sustainability after the funding stops? (Photo: A.Yonezawa)



The beneficiary should be the local people. The Module on freshwater should address the needs of women.

(Photo: A.Yonezawa).

▶ We are dealing with freshwater crisis but there is a picture of an ocean. Is not it a big contradiction? (Photo: A.Yonezawa).



Without agriculture, the wise use of wetlands would not be complete. (Photo: A.Yonezawa)



▶ In the name of coordination, direct interaction has been delayed, thus hampering the project activities at the grassroots. (Photo: A.Yonezawa)

Excuse me! Something, important, is missing in the package. The missed point is the linkage between modules. Some kind of explanation would be helpful. (Photo: A.Yonezawa)







► Incorporation of simple methods of water purification would enhance the module. (Photo: A.Yonezawa)



Learning is a continuous, life-long process. It is never ending and never complete. (Photo: A.Yonezawa).



Education is a tool of empowering the people to make a connection between their action and global impact.



A clarification is needed. Who are the facilitators? Are these modules for facilitators or for different groups?

(Photo: A.Yonezawa)

Experiences show that a good educational material should be placespecific, site-specific and issue specific. (Photo: A.Yonezawa)



 Sharing the joke and caring the participants. (Photo: M. Takahashi)



Wise use of wetlands: Diverse groups, common goal but differentiated responsibilities. (Photo: M. Takahashi)

What is in the module? Participants give a final look into the module (Photo: M. Takahashi)





▶ Sharing the findings of pre-testing from Chilika Lake. (Photo: M. Takahashi)

Annex A

List of Participants

The participants are listed in two groups; (1) participants sponsored by IGES and (2) participants sponsored by RCJ.

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Annex B

Visioning Exercise

This is an activity-based workshop; two-thirds of time was spent on discussion and one-third on sharing of experiences on case studies (see Chapter 1). One of the activities was this visioning exercise. The logical framework (Log Frame) was used for this purpose to stimulate discussion on the effective dissemination of educational materials in the region, particularly the educational package prepared by the IGES/EE Project. The exercise was conducted by Dr. Bishnu Bhandari, the output of which is given below.

Output of the visioning exercise

- **Discussion topic**: How to disseminate the educational package effectively.
- **Objectives**: The participants came to consensus that the primary objective of the dissemination of materials should be;
 - to create and improve awareness, knowledge, skills in wetland conservation through participation, sharing of information and experience; and
 - 2) to enhance partnership and capability of the target groups for wetland conservation.



➤ Small of group of participants discussing for a common point. (Photo: Mr. Takahashi)



➤ A participant displaying cards on the clip board. (Photo: Mr. Takahashi)



Organizing index cards on the clip board module (Photo: A.Yonezawa).

Tasks identified: In order to achieve these objectives, the following major tasks were suggested.

- Conducting training activity for the master trainer (and the facilitator) for each module
- Conducting field testing of modules
- Setting up a network of local and indigenous people
- Publishing all modules in the local language including editing and translating
- Distributing the package to the right target groups
- Monitoring and evaluation of these activities



Display of the output of the exercise.
(Photo: Mr. Takahashi)

Target groups: Relevant GOs, NGOs and CBOs, schoolsl, media, international organizations (IOs) and private sectors.

Besides, it was agreed that IGES should allocate necessary budget for conducting above activities, especially printing and distribution of educational materials.

Different modes of distribution such as books, CD, Web Page, booklet, the Internet, newsletter, bulletin, media and television should be employed to ensure that the package reaches out to a wide range of users.

It was also suggested that the timeframe for each activity should be determined along with the indicators of success.

Due to time constraints, the exercise had to be adjourned here.

Annex C

Celebrating World Wetlands Day and Asian Wetlands Week

In order to promote activities for the upcoming Asian Wetlands Weeks (AWW) and discuss on the possibility of holding the next Asian Wetlands Symposium (ASW), the Ramsar Center Japan (RCJ) organized an informal discussion, which was led by Prof. Toru Iwama, President of RCJ. The brief summary of the discussion are as follows.

- Induction of Prof. Kamapand Bhaktikul (Mahidol University) and Dr. Che Salmah Md. Rawi (Universiti Sains Malayasia) as international members of RCJ.
- Members who attended Ramsar COP8 held in Spain reported that they were involved in the distribution of the proceedings of the last AWS, both hard copy and CD-ROM. The AWS was held in Malaysia in 2001. The members attending Ramsar COP 8 organized an exhibition; distributed the Penang statement, an important output of AWS; attended regional meetings and side events during the convention; and visited many exhibition booth. They also shared their individual experiences in the discussion.



▶ Prof. Iwama and Ms. Nakamura showing the Penang Statement on wetland conservation.

- Ramsar Center Japan would coordinate the celebration of Asian Wetlands Week (AWW) in the first week of February starting from 2nd to 9th. The theme of this week is *wetlands love children and children love wetlands*. The participants reported their plan of activities for the upcoming Asian Wetlands Week. Ms. Reiko Nakamura, Secretary-General of RCJ informed that all these activities will be posted on the Website as they become available. She also informed the members that as part of the AWW celebration, RCJ has been coordinating a wetland festival for children at Higatsu Nigata, a Ramsar site 18-19 February 2003. Three elementary school children from each countries; China, Japan and Korea would come to attend the festival in Japan. These children would make a presentation on *wetlands and our life*. They will also make drawings and these drawings will be exhibited at the festival.
- Concerning the follow up of the Asian Wetlands Symposium (AWS), it was suggested that since the Penang Statement has clearly stipulated the periodic holding of the symposium in the region, it was suggested that the symposium should be held prior to the 9th Ramsar COP, which is scheduled to be held in Uganda in 2005. Regarding the theme of the forthcoming symposium, the following were suggested, (1) cultural aspects of wetlands, (2) climate change and wetlands, (3) wetlands and poverty alleviation, (4) conducting case studies and guidelines, (5) conducting demonstration sites, (5) CEPA (Communication, Education, Public Awareness) for sustainable development, (6) agriculture and wetlands, etc. If the members have any suggestions, they



should send them to the office of Ramsar Center through e-mail.

Aya-san making deliberation on COP 8



- It was also pointed out that members should prepare a proposal for holding the next AWS. The proposal should not exceed 3 pages.
- Reiko Nakamura informed that there would be two events on wetland conservation; (1) Forum on Rehabilitation of Wetlands Ecosystem (6 February 2003) and International Workshop on the Wise Use of Lagoon Wetlands (22-23 July 2003), both to be held in Kushiro, Hokkaido, Japan. She advised that we all should intend to attend them. Details would be sent as they become available.



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