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ANNAMALAI UNIVERSITY

# Summary of Course Participant Evaluations

## International Course on Biodiversity in Mangrove Ecosystems

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Prepared by Gemma Boag and Hanneke Van Lavieren



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## **1. Course Background**

The International Course on Biodiversity in Mangrove Ecosystems is now entering its ninth year. First held in March 2001 at Annamalai University, it is a collaboration between UNU-INWEH, UNESCO and Annamalai. The course has also been introduced as open courseware through an open learning initiative with UNU, Tokyo.

The course focuses on mangrove ecosystems but maintains an integrated approach towards coastal management. Its primary objective is to build capacity among professionals and institutions in developing countries to undertake monitoring, research and conservation of critical coastal ecosystems within mangrove forests. Participants learn about scientific methodology and the latest research in the field through a multidisciplinary teaching team and hands-on involvement. A secondary objective is to develop a network of professionals from developing countries working in the field, particularly in South and South-East Asia.

## **2. Report Overview**

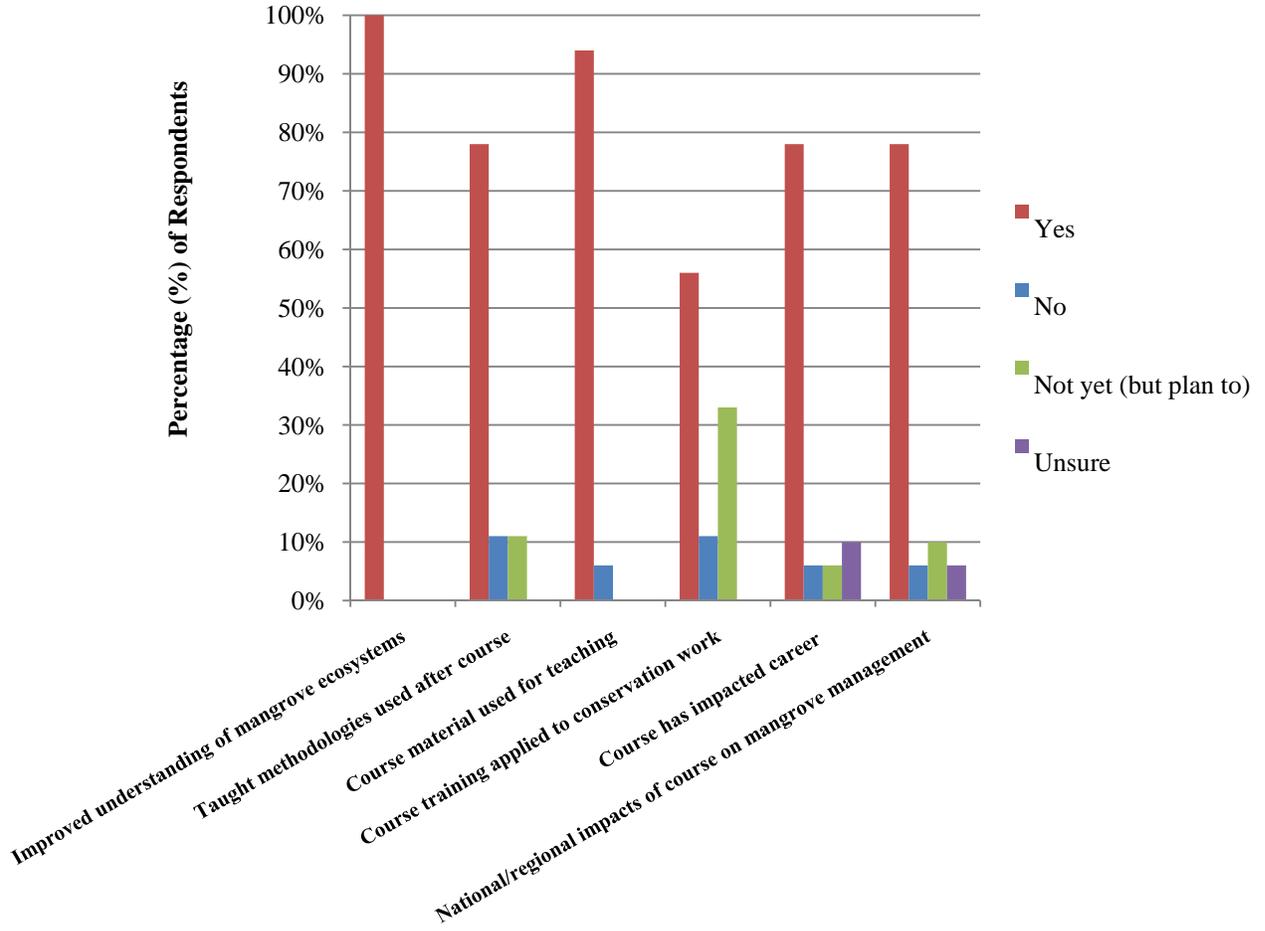
An e-mail questionnaire was distributed to past participants in the International Course on Biodiversity in Mangrove Ecosystems run at Annamalai University, India, in November 2007 and 2008. Of the 32 participants contacted, a total of 18 returned the questionnaire (see Annex 1). This report provides a summary of the responses received.

In general, participant feedback shows the course has been very successful at achieving its stated objectives: capacity-building for integrated coastal management and creation of a network of professionals from developing countries working on mangrove forests and related coastal issues. Not only is capacity being built at the individual level, alumni have also transferred course knowledge to their students and colleagues to increase capacity at a regional level in South and South-East Asia. Methodologies and information learnt on the course have been applied in many respondents' research projects as well as mangrove conservation activities.

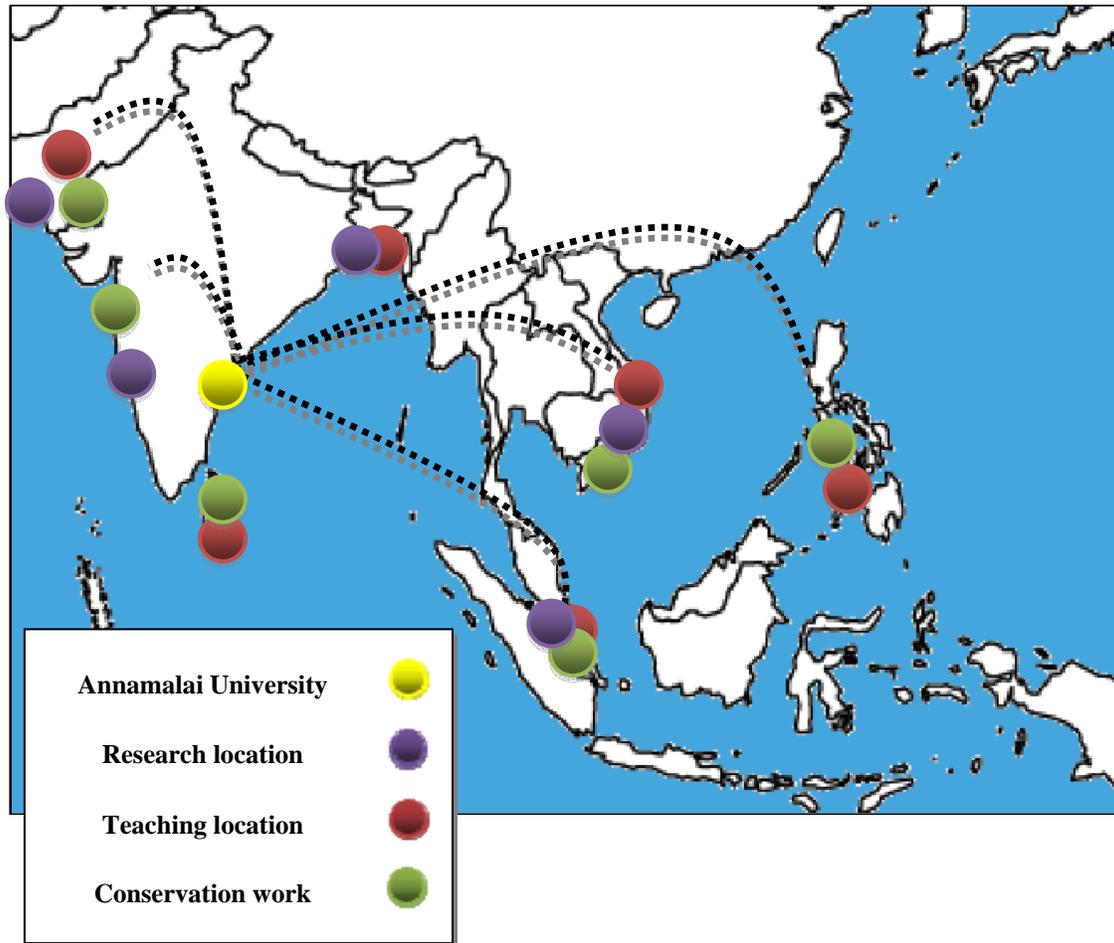
Potential areas of opportunity include:

- Drawing stronger linkages between course training and potential conservation activities.
- Creating a course participant database to facilitate communication and collaboration among alumni across the South-East Asian region.
- Introducing training material on economic valuation of mangrove forests for developing conservation strategies.
- Demonstrating more hands-on research techniques and providing more specific advice for studying different species in mangrove forests.
- Identifying low-cost methodologies that can still be effective in a low-resource context (in terms of both funding and equipment).

### 3. Summary of Responses



#### 4. Dissemination of Course Training across South-East Asia



## **5. Respondent Feedback**

***Question 1:*** *Have you developed an improved understanding of critical coastal ecosystems within mangrove forests?*

All respondents indicated that their understanding of mangrove ecosystems had improved after participation on the course. Specific learning areas highlighted were:

- Increased knowledge of biota inhabiting mangroves, which led to a greater recognition of mangrove forests' importance for biodiversity.
- Species' interactions in mangrove forests and the integrated nature of coastal ecosystems.
- Heightened awareness of mangrove issues and research outside participants' home countries.
- New methodologies for mangrove research.

***Question 2:*** *Have you used the methodologies learnt in the course for undertaking research and monitoring of critical coastal ecosystems within mangrove forests? If yes, what activities did you implement, when, and where?*

The majority of respondents (78%) have used methodologies learnt on the course upon returning home. A further 11% indicated they plan to use some techniques in the future. Some of the most commonly cited methodologies included techniques for studying:

- Mangrove forest biomass (Gujarat coast, India; Sembilang National Park, Indonesia)
- Nutrient dynamics (Can Gio Reserve, Vietnam; Sundarban mangrove forests)
- Sedimentation rates (Sundarban mangrove forests)
- Tree cover index (Can Gio Reserve, Vietnam)
- Mapping forest changes (Sembilang National Park, Indonesia)
- Identification of mangrove tree species (Karachi, Pakistan)
- Identification of medicinal plants in mangrove forests

Simple and low-cost methodologies were highlighted as particularly useful. It is important for course leaders to demonstrate the most recent and innovative research techniques while also discussing how they can be used on a small budget or with fewer resources.

***Question 3:*** *Have you used the information learnt at the course for teaching purposes in your country? If yes, when and where and to what audience (how many students)? Have you exchanged this information and experiences in any other way (besides teaching)?*

Most participants (94%) have used the course training for teaching purposes in their home country. Bearing in mind that only some respondents provided numerical data, over 470 undergraduate students, 340 secondary school students, 28 secondary school teachers, and 10 professional colleagues have benefited from information their teachers learnt on the mangrove course. Other groups to whom knowledge has been transferred include postgraduate students and communities living near mangrove forests.

The course training has been used in a wide variety of teaching environments, ranging from academic classes on mangrove ecology and coastal aquaculture to practical seminars on nursery and forest management techniques and field research methods (e.g. how to identify mangrove tree species). One respondent used his new knowledge to educate a community research project on the use of plant hormones for stimulating growth in mangrove seedlings and investigating medicinal properties of plants in mangrove forests.

The map above shows how far the course training has been disseminated across South and South-East Asia. Specific institutions and locations where course material has been used for teaching purposes are:

- Saigon University, Ho Chi Minh City, Vietnam
- Hue province, Vietnam
- Noakhali Science and Technology University, Bangladesh
- Rajarata University, Sri Lanka
- University of Colombo, Sri Lanka
- University of Ruhuna, Sri Lanka
- Western Institute of Technology, Iloilo City, Philippines
- Sriwijaya University, South Sumatra, Indonesia
- Forest School Miani, Sindh, Pakistan
- University of Karachi, Pakistan
- Rehri village, Karachi District, Pakistan

***Question 4:*** *Have you used the information learnt at the course for developing conservation strategies for critical coastal ecosystems within mangrove forests? If yes, how, when and where?*

Approximately half of respondents (56%) indicated that they had applied their new knowledge from the course to conservation strategies for mangrove forests. Another 33% reported that while they had not yet done any conservation work, they planned to use the course material for that purpose in the future.

The primary type of conservation work respondents are engaged in is restoration or rehabilitation of mangrove forests. In Pakistan, one participant advised officials on increasing biodiversity in mono-specific stands of mangroves in the Indus Delta. He also suggested forest officials use the “fish bone model” taught on the course to facilitate vegetation growth in high-lying mangrove areas. Course participants learned about this technique on a field visit in Tamil Nadu. A particular highlight in Sindh, Pakistan in July 2009 was the planting of 541,176 mangrove seedlings, setting a Guinness World Record for the most trees planted in a single day. Another participant used knowledge gained through the course to develop a small-scale nursery in Iloilo City, Philippines. There, the seedlings are being used to re-forest a local creek and river with rare species of mangroves.

As shown in the map above, conservation activities influenced by the training course are spread across South and South-East Asia in the following locations:

- Mekong Delta, Vietnam
- The Pambala, Sri Lanka
- South Gujarat, India
- Palembang, South Sumatra, Indonesia
- Indus Delta, Sindh, Pakistan
- Iloilo City, Philippines

**Question 5:** *Has your career been impacted in any way by this course?*

The majority (78%) of questionnaire respondents felt that their career had been positively impacted by the course. Through learning new research methodologies, many participants reported a boost in confidence about their knowledge of mangrove forests and their competence for working in the field. For one graduate student, participation in the course helped him identify a research topic for his PhD. He will be looking at the role of mangrove forests in carbon sequestration in the Indus Delta.

Several respondents believed the course had a positive impact on their qualifications for working in mangrove forest management while others felt the training was not directly linked to career advancement. One potential area for improvement is to have more detailed training on research methods for specific species (crab, nematode, fin fish, etc.) and discuss the practical advantages and disadvantages of different techniques.

**Question 6:** *Has the course had any impacts on mangrove management in your country, or in the South-East Asian region?*

Most respondents (78%) felt the course had impacted mangrove management in the region. Course participants are passing on their new knowledge to students and colleagues and, in doing so, are raising awareness about how mangrove forests can be effectively protected. Enthusiasm and knowledge from the course has been linked to the large-scale mangrove planting efforts in Pakistan and it further encouraged one participant to suggest to officials that the Indus Delta be declared “Reserved Forests” rather than “Protected Forests” to afford them greater protection.

In some South-East Asian countries the number of experts working on mangroves is quite small, therefore strengthening their expertise and then linking them to colleagues in other countries is projected to have positive impacts on mangrove management. One respondent suggested that development of a course participant database would better enable alumni to stay in touch and collaborate across the region.

In the future, the course could develop more extensive training on economic valuation of mangrove forests (e.g. value of structural defense, potential for carbon sequestration, etc.) to have a greater impact on mangrove conservation in the region. One participant explained that training on economic valuation would better enable alumni to demonstrate to their home governments and funding bodies why mangrove conservation is important in both ecological and socio-economic terms.

**Annex 1:** Questionnaire respondents

<b>Respondent</b>	<b>Course</b>	<b>Affiliation</b>	<b>Country</b>
Mr. Waqar Ahmed	2007	University of Karachi	Pakistan
Mr. M. Syed Ali	2008	Alagappa University	India
Ms. Kakolee Banjeree	2008	Anna University	India
Mr. M.A.A.B. Dilhan	2008	Open University of Sri Lanka	Sri Lanka
Mrs. Ellen Flor C. Doyola-Solis	2008	Southeast Asian Fisheries Development Centre	Philippines
Dr. W.A.H.P. Guruge	2008	University of Ruhuna	Sri Lanka
Ms. Phan Thi Thuy Hang	2008	Hue University of Sciences	Vietnam
Mr. Mehedi Mahmudul Hasan	2007	Noakhali Science and Technology University	Bangladesh
Mr. Edgar M. Hortillosa	2007	Western Institute of Technology	Philippines
Dr. Mahmood Hossain	2007	Khulna University	Bangladesh
Ms. Pham Quynh Huong	2007	University of Natural Sciences	Vietnam
Mr. Abid Hussain	2008	Sindh Forest & Wildlife Department	Pakistan
Ms. Anindita Mitra	2008	University of Kalyani	India
Ms. Tran Ngoc Dem My	2008	University of Sciences	Vietnam
Mr. A.F.M. Arifur Rahman	2008	Noakhali Science and Technology University	Bangladesh
Dr. Harshad Salvi	2008	Gujarat Ecological Education & Research Foundation, Indroda Nature Park	India
Mr. Tengku Zia Ulqodry	2007	Sriwijaya University	Indonesia
Dr. Rozainah Zakariah	2007	University of Malaya	Malaysia