

Training and Capacity Building for Managing Our Mangroves Resources – UNU's Role to Meet Regional Challenges

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Coastal Areas in Focus

For the human society, coastal areas are an important interface between terrestrial and sea-based activities. Not by coincidence, a vast majority of the global population is concentrated along this interface; it is estimated that about 55% of the world's population lives in coastal areas. Our society is heavily dependent on coastal resources, often leading to intense competition for these resources between various activities like food production and provision, urban development, transportation, recreation and waste disposal. At the same time, it is ironic that about half of the world's coastal ecosystems face threats to their existence as a result of human activities.

In this backdrop, the coastal ecosystems in the Asia-Pacific region are perhaps among the most threatened (Adeel and King, 2002). For example, more than seventy percent of the East Asian population lives in coastal areas, and depends on marine and coastal resources for food, employment and income. In South Asia, coastal populations are vulnerable to extreme weather events and survive on diminishing coastal resources. In the western Pacific region, small islands are threatened by the encroaching pressures of development and climate change.

Comprehensive strategies for protection of the coastal environment and sustainable use of their services are needed to meet these challenges. These strategies must span and integrate with national, regional and international policy frameworks. It is equally important to involve communities as well as the full range of stakeholders in coastal management.

In recent years, a significant improvement in management of these resources in the Asia-Pacific region can be observed. There still is a considerable room for improvement in how the services provided by coastal ecosystems are perceived and managed. One factor stands out in meeting this challenge: a shortage of human, technical and institutional capacity to manage coastal resources. As most of the countries in the region fall in the developing-country envelope, these shortages are often the limiting factor.

Mangroves as Key Coastal Ecosystem

Mangrove ecosystems – comprising forests as well as numerous terrestrial and aquatic species – are widespread in the Asia-Pacific coastal areas and play an important ecological role while providing a variety of services for human well being. The benefits obtained from these thriving mangrove ecosystems are quite broad and encompass a variety of economic, environmental and social aspects, including carbon sequestration for combatting global warming (Fujimoto, 2000) and protection from erosion, flooding, cyclones, typhoons and tidal waves (Primavera, 2000). It is, therefore, important that the coastal management

activities in the Asia-Pacific region give due consideration to management, restoration and conservation of these precious ecosystems.

In the recent years, the over-exploitation of coastal areas due to various anthropogenic activities has accelerated the degradation of mangrove forests. For example, the dense mangrove forestation in the Sundarbans (Bangladesh and India) and western India has been decimated due to the development of shrimp farming. As a consequence, natural disasters like cyclones have cost thousands of lives and inflicted severe damage to infrastructure. The destruction of mangroves also affects the fishery industries and coastal ecosystem balances (Baran and Hambrey, 1998). The leaf-litter detritus from mangroves is important to fisheries because it provides an essential source of nutrients for the trophic food web and juvenile fish. It is estimated that 90% of all marine organisms spend some portion of their life cycle within mangrove systems (Adeel and Pomeroy, 2002).

Deforestation of the mangrove areas is mainly related to economic and development activities. Traditionally, the anthropogenic activities in mangroves were limited to subsistence of local coastal communities for provision of fuel, medicine, food and building materials. However, in recent years huge areas of Asian mangrove have been converted to shrimp ponds. (Sudara, 1997; Yeung, 2001). These shrimp farms, often with intense application of fertilizers, nutrients and antibiotics, have resulted in irreversible damage to mangroves. Destruction of mangrove ecosystems – primarily through deforestation – is quite extensive and has taken place on a world-wide scale.

In general, more than 50% of the mangroves areas have been destroyed in most countries of the Asia-Pacific region. In Indonesia, which contains about a third of the world's total mangroves areas, more than half of the forests have been cleared during the past fifty years (Sudara, 1997). By the 1980's about 800,000 hectares of mangroves in Indonesia had been cleared for transmigration settlement. In Malaysia, approximately one third of the country's mangroves were lost during the second half of the 20th century, with the largest scale of losses on the western part of the peninsula (Sudara, 1997). Indonesia and Malaysia also use mangroves as a source for the export wood-chip industry and for oil palm cultivation. In Singapore, much of the mangrove forest has been reclaimed for urban development (Sudara, 1997). Vietnam lost many of its mangroves during the Vietnam War, due to pesticide use (Hong, 2000). Aggressive application of pesticides like DDT in agricultural activities has also impacted the coastal ecosystems (e.g., in India: Subramanian, 2000).

This brief overview of the situation clearly demonstrates that the threats to mangroves are serious and demand our immediate and urgent attention. International organizations have a particular role to play as they often have the human, financial and technical resources for facilitating conservation and restoration of mangrove ecosystems.

UNU's Role in Mangroves Conservation

The United Nations University (UNU) has played a significant role in mangrove conservation and restoration through promotion of education, research and awareness-raising. The UNU has developed a complementary approach to existing work on the coastal environment, identifying outstanding areas of need and focusing projects within those areas. One of the most significant contributions of UNU's work is the capacity development of research and scientific institutions in the East Asian region to undertake coastal water pollution monitoring.

This effort has helped the institutions in understanding the extent of pollution coming to coastal areas from land-based sources. The findings from this monitoring programme have raised awareness among the general public about coastal pollution and its sources while influencing national policies to manage the coastal pollution.

Research and capacity development for mangroves conservation and restoration has received particular attention in our work. A major milestone in this effort was the International Workshop: “Asia-Pacific Cooperation on Research for Conservation of Mangroves” held in Okinawa (Japan) during the year 2000. The presentations and discussion during the workshop led to development of the Mangroves Action Plan. This plan outlined the research needs for the region and initiatives for information dissemination. Some of the points relevant to this paper, as outlined in the Mangroves Action Plan, are:

- It was suggested to develop and disseminate information regarding mangrove management techniques as a set of guidelines.
- Public education and awareness-raising – at various levels from community to international – should be a key point of dissemination activities; cooperation of the popular media should be sought in this respect. Inclusion of mangrove issues in formal education processes, especially those for children, should be a part of this process.
- There should be an increased coordination among various international and regional institutions in undertaking capacity building activities. Information dissemination and networking can greatly assist in this respect.
- There should be emphasis on training the educators and trainers for conservation of mangroves.

A number of activities were initiated as a result of this workshop and in keeping with the Mangroves Action Plan. Two of these are described here for the reader’s benefit.

First, working with our partner organizations, UNESCO’s Man and the Biosphere Programme (MAB) and the International Society for Mangrove Ecosystems (ISME), a major regional initiative was launched to undertake research for conservation of mangroves. This 3-year project called “Asia-Pacific Co-operation for the Sustainable Use of Renewable Natural Resources in Biosphere Reserves and Similar Managed Areas (ASPACO)” is managed by UNESCO in collaboration with the UNU and ISME. Project activities are taking place in many countries in the Asia-Pacific region, including China, Indonesia, Japan, Palau, the Philippines, Samoa, Thailand, and Vietnam.

Second, the UNU initiated a regional training course on mangrove biodiversity in collaboration with UNESCO and the Annamalai University. This course was modeled after the UNU International Training Workshop on Marine Biodiversity in Mangroves and Coastal Ecosystems, also held at the Annamalai University during February 2000. The remainder of this paper focuses on this course and its impacts.

Training Course on Mangroves Biodiversity – A Successful Example

This training course, which has now entered its third year, has been focused primarily on mangrove ecosystems. At the same time it is emphasized that there is a need for maintaining an integrated approach towards management of coastal ecosystems. A particular emphasis is on the methodologies for assessing, monitoring and conserving biodiversity in mangrove

ecosystems. It relies on the expertise and resources available at the Centre for Advanced Studies in Marine Biology at the Annamalai University while also engaging a number of international experts in this field.

The main objective of the Training Course is to build the capacity of professionals and institutions in developing countries of the Asia-Pacific region to undertake monitoring, research and conservation of critical mangrove ecosystems. This is achieved through training of young professionals in the scientific methodology and description of latest research work on related subjects. A secondary objective is to promote and encourage development of a network of professionals from developing countries working in this field. It is anticipated that these young professionals will not only disseminate their knowledge to others in their respective institutions and countries but also facilitate information dissemination at a regional scale.

The training course comprises lectures and demonstrations, as well as group discussions. An interesting element of the course is presentations by participants on the mangrove and related ecosystems of their respective country or region. Several field visits to the adjacent Pichavaram mangroves are included to familiarize the participants with the advanced methodologies for taxonomy, monitoring and conservation in mangroves ecosystems.

This course was recently evaluated by a panel of mangroves experts who lauded the initiative and its regional impact. A number of improvements in the course design and implementation have also resulted due to this evaluation. This positive outcome will help ensure an effective and useful capacity development activity by the UNU for many years to come.

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