

Scientific Report on the outcome of
**The National conference on identification of gaps in knowledge required for the
sustainable management of mangrove ecosystems in Sri Lanka**

04 - 06 June, 2010



Lalitha Hotel, 200, Galle road, Pamburana, Matara, Sri Lanka.



Background

Management of natural resources is essentially the management of numerous processes that take place among the physical, chemical and biological components of the ecosystem that they are part of. These processes drive the ecosystems to perform an array of functions such as primary production, pollution abatement and checking soil erosion, thus providing great services to mankind. Wetlands have long been considered places not worthy of keeping and managing, for the mere reason of ignorance about the natural services that they provide free of charge and the underlying processes that render them the ability to perform the functions that give rise to the services.

Photosynthesis, biological nitrogen fixation, conversion of ammonia into nitrates, decomposition of plant and animal matter, trophic interactions, provision of habitats for fauna and flora, removal of pollutants from water through direct uptake and assimilation as well as storage are the key processes in mangrove ecosystems that give rise to a number of life-supporting services. They include removal of carbon dioxide from atmosphere, release of oxygen, conserving biodiversity, land/water- scape of high aesthetic value, resource base for ecotourism, preserving option values, provision of resources for sustenance, such as timber, firewood, wood for charcoal, thatching material, fruits, leafy, vegetables, medicines and peat, protein (edible mollusks, crabs, shrimps and fish), provision of livelihood opportunities for rural communities, check shoreline erosion and protection to land-uses in the hinterland with natural (low-cost) barrier for coastal protection (Fig.1). Maintaining the life-supporting ecological processes is the crux of mangrove area management.

Economic development of coastal resources affects the mangrove ecosystems through altering their ecological processes and functions, eventually reducing their regenerative capacity and ability to support life, including that of man. Knowledge on processes therefore is an essential pre-requisite to execute appropriate development that will inflict minimum change in the life-supporting capacity of mangrove ecosystems and dependent communities, both human and wildlife. Since human activities can change the processes to a deleterious extent, understanding the inter-dependence of ecological and social systems is of utmost significance for their management.

The prime objective of this national conference held at Matara, Sri Lanka, with the auspices the Earthwatch Institute and the Greendyke project of University of Ruhuna was to collate existing knowledge on mangrove ecosystem processes and functions as well as that on the inter-dependence with coastal communities and their livelihoods, enabling identification of gaps in knowledge that are vital for management of mangroves.

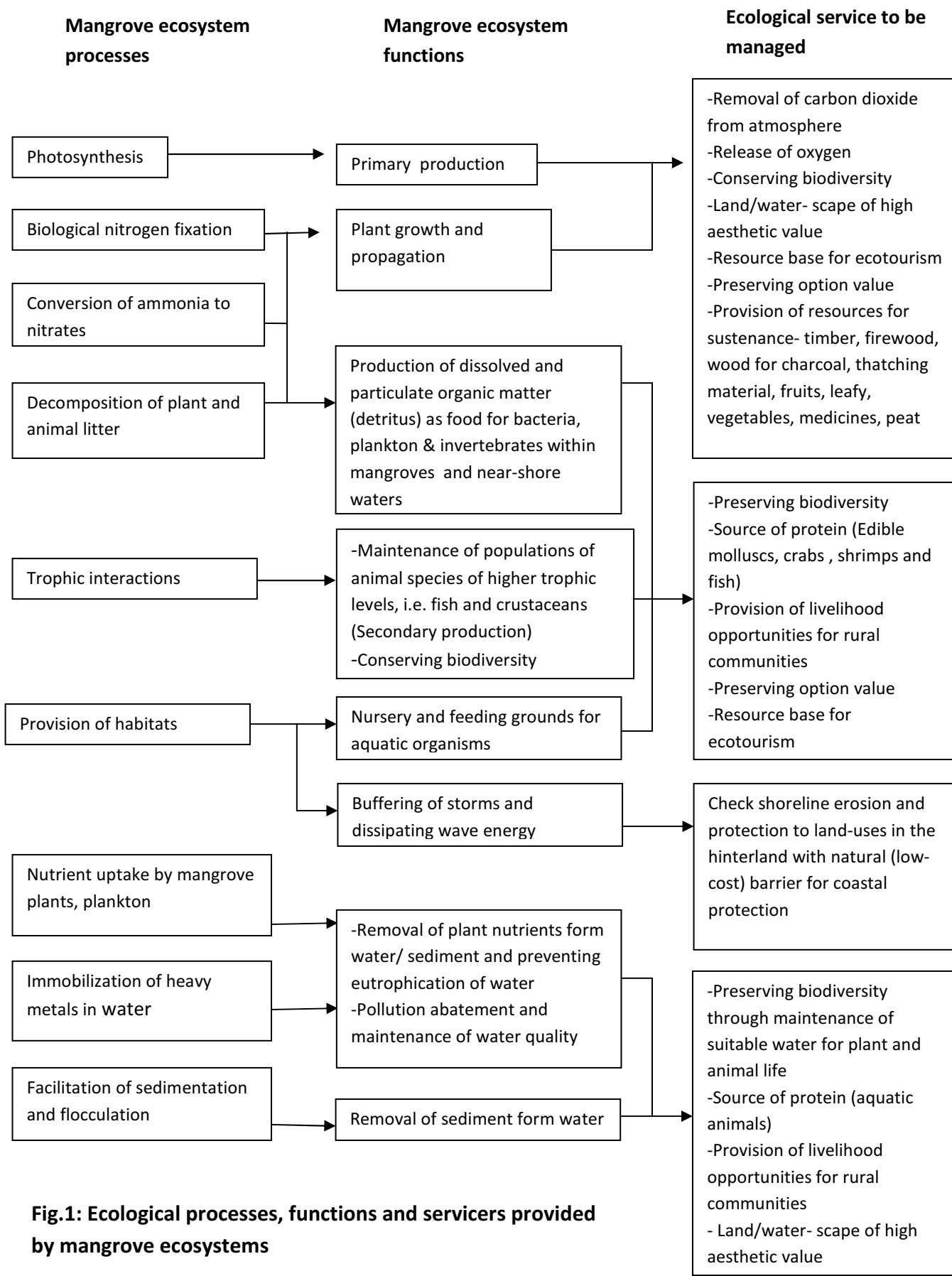


Fig.1: Ecological processes, functions and services provided by mangrove ecosystems

A number of mangrove researchers presented the knowledge they have hitherto generated on mangrove ecosystems, their processes, functions and services as well as human dependence on mangrove resources and services for their livelihoods and sustenance. Primary productivity of mangroves, decomposition of mangrove plant litter/organic matter, habitat heterogeneity as well as impact of human activities, particularly the unsustainable ventures such as shrimp farming was highlighted while emphasizing the inadequate existent knowledge base to solve environmental pollution issues caused by such unsustainable development activities that affect mangrove areas.

A noteworthy disclosure at the conference was that the present knowledge on total extent of mangroves in Sri Lanka is dubious as the mangroves in the northern and eastern coasts of Sri Lanka were inaccessible in the near past due to civil unrest. Moreover, floristic diversity too needs confirmation through more research and surveys in the northern and eastern coasts.

Insufficient knowledge disseminated to planners and implementers of mangrove rehabilitation programmes was revealed the major cause of their failure, despite the guidelines for planting/replanting of mangroves have already been prepared by institutions such as IUCN for the purpose. It was also surfaced that this state of affairs is more a result of poor dissemination strategies than lack of knowledge on the subject.

Findings of recent research on the role of mangroves in checking shoreline erosion through consolidation of sediment was presented while highlighting the unscientific quotations on contribution of mangroves to enhance sedimentation in estuaries that are apparently based on anecdotal evidence and pseudo-science. Increasing sediment loads to estuaries inevitably cause sedimentation, predominantly due to a physical process known as flocculation, that takes place in estuaries where ion-laden seawater meets sediment-laden freshwater. The sediment consolidation function of mangroves however was identified to be further investigated under various coastal environmental conditions.

Conservation status of most mangrove plant species in Sri Lanka are known and a fair volume of knowledge exists on ex-situ conservation methods, especially nursery rearing of very rare mangrove species such as *Lumnitzera littorea*. It was also revealed the necessity of documenting existing knowledge related to maintenance of nurseries, identification of appropriate areas for planting and maintenance of mangrove plantations.

The mangrove loss, especially due to construction of ponds to culture tiger prawns (*Penaeus monodon*) in inter-tidal areas on the north western coast of Sri Lanka has been presented and inaptness of mangrove areas for shrimp farming was brought to attention of the forum. Depleting carrying capacity of inter-tidal areas and near-shore waters for cultured shrimps and

other aquatic organisms due to pollution caused by farm effluent discharges and concomitant disease problems that contributed to the collapse of shrimp farming also was highlighted.

The meeting organized for the mangrove stakeholders was a venue for stakeholders ranging from fishermen to decision makers to voice their perceptions, opinions and also knowledge over mangrove ecosystems, their management and constraints in sustainable use of mangrove resources. Overall opinion of them was even though the awareness and acceptance of mangroves as a resource worthy of managing, the strategies adopted currently are insufficient and inappropriate to conserve them for the following reasons.

1. Ambiguity associated with ownership/ custody of mangrove areas of Sri Lanka. Mangrove areas fall under a range of jurisdictions, from that of Forest Conservation Department to Wildlife Conservation Department, Coast Conservation Department (CCD) and Divisional Secretariats in coastal Districts. The latter categorizes mangrove areas as “undeveloped land” and thus the mangroves that are under their jurisdiction are highly vulnerable and have been subjected to reclamation for other land uses such as urban development, settlement establishment and shrimp farm development. Since jurisdiction of the CCD is restricted to a narrow belt (300 m above highest water level) on the terrestrial part of the coast, legal protection rendered to mangroves is marginal as most areas are located outside this geographical area.
2. Absence of control and monitoring mechanisms over privately owned mangrove areas
3. Inadequate participation of resources user-communities in management planning and implementation. The stakeholders were with the opinion that a co-management model is appropriate to be developed for mangrove area management that gives the grassroots some ownership on the resource base and thus they would contribute to mangrove conservation through serving as guardians and custodians of the resource.
4. Establishment of University-NGO-Community partnership to carry out research to fill the gaps in knowledge required for mangrove area management.
5. Less priority given for the protection of remaining mangroves in Sri Lanka.

Prof. L. P. Jayatissa

Department of Botany

University of Ruhuna

Matara, Sri Lanka

Prof. Mala Amarasingha

Department of Botany

University of Kelaniya

Kelaniya, Sri Lanka

