

MANGROVES – A RESOURCE TO BE PROTECTED

P. A. Swarnamali

The name mangrove is applied to plant species belonging to different unrelated families, which possess similar physiological characteristics, structural adaptations and habitat preferences. It is also used to denote a plant community.

Mangrove community is a unique ecosystem since it is composed of terrestrial, marine and fresh water components. They are woody, seed-bearing, highly-specialized plants, ranging in size from shrubs to tall trees.

Mangroves are considered to be one of the most highly productive ecosystems in the world. They occur in the sheltered shores of the tropics and sub-tropics.

Mangrove plants show special adaptations to live in saline and poorly consolidated soils. The mangrove ecosystem is an ancient, resourceful and fragile ecosystem.

Salinity imposes a physiological drought for the plants and also hampers germination. The loose soil decreases the efficiency of the rooting system.

To overcome these difficulties, the mangrove species have developed different adaptations.

The most outstanding of which are the methods of conserving fresh water, vivipary and an efficient root system. The alluvial substratum, total current and wave action warrant extra support for some mangrove species. Prop roots arising from the branches and stilt roots arising from the main stem help anchor the plant. All mangrove plant species have a thick leaf cuticle for protection and reduction of transpiration and the water storage tissue is extensive. The entry of salt is totally or partially prevented by ultrafiltration at the roots. The salt water absorbed is desalinated within the plant. The plant secretes salt through special glands on the leaves. e. g. *Avicennia*, *Acanthus* and *Aegiceras*. Vivipary is the adaptation to ensure a late developmental stage of the embryo when it is released from the mother plant and meets the hostile conditions of the environment.

In Sri Lanka mangroves occur mainly around lagoons and to a certain extent near river mouths. It has been estimated to be around 6,000-7,000 ha.

In Sri Lanka where the tidal variation is less than 1m, the mangroves form only a thin belt around lagoons and river mouths. But in countries where the tidal variation is greater it can go up to 12-14 miles inland, and the mangrove formation covers extensive areas.

The main mangrove areas in Sri Lanka are:

1. Puttalam, Dutch Bay, Portugese Bay
2. Batticaloa
3. Trincomalee

Thirty-one mangrove plant species have been reported in Sri Lanka.

The mangrove vegetation contains species that do not occur anywhere else and these plants are generally termed true mangroves. There are also other species which are found associated with them. These associates occur in fresh water swamps and salt marshes.

True mangroves

1. *Rhizophora apiculata*
2. *R. mucronata* (kadol)
3. *Bruguiera cylindrica*
4. *B. gymnorrhiza* (malkadol)
5. *Ceriops tagal* (rathugas)
6. *C. candolleana*
7. *Avicennia officinalis*
8. *A. marina*
9. *Xylocarpus granatum*
10. *X. moluccensis*
11. *Excoecaria agallocha*
12. *Lumnitzera racemosa*

13. *Aegiceras corniculatus*

14. *Nypa fruticans*

Mangrove associates

1. *Cerbera manghas*

2. *Tamarix gallica*

3. *Acanthus illicifolius*

4. *Sphaeranthus indicus*

5. *Sonneratia caseolaris*

6. *Clerodendron inerme*

7. *Heritiera littoralis*

8. *Dolichandrone spathacea*

9. *Acacia farnesiana*

10. *Sesuvium portulacastrum*

11. *Hibiscus tilliaceus*

12. *Acrosticum aureum*



Up to now very little attention has been given to mangroves in Sri Lanka. The study of the mangrove ecosystems in Sri Lanka is also still at a very early stage.

Mangroves are economically and also ecologically important for Sri Lanka. Economically, mangroves are related to fishing in the west coast as well as the east coast. Prawns and estuarine crabs are commonly caught from the lagoons associated with mangroves. Due to fishing and other economic activities, mangroves have been put under man-made pressure.

Mangroves are not wastelands, but a living natural system that can be very highly productive.

We must think of what we will lose if this unique vegetation is destroyed.

Mangroves do not regenerate easily or spontaneously for a variety of reasons, thus overexploitation may be as disastrous as natural calamities.

Fishing hamlets have sprouted in many mangrove areas. Also, considerable areas of mangrove have been cleared to reclaim the land for other more profitable uses, as well as for human settlements.

Larger trees such as *Rhizophora* species have disappeared to a great extent as they are used for house building purposes and for firewood. "Brush pile fishery", where brush piles of mangrove poles and mangrove branches placed vertically or slightly inclined to a depth of less than 1.5 metres, are used to attract fish and crustaceans, is an additional source of exploitation. This is a major fishing technique in shallow lagoons, especially Negombo lagoon.

Ecological uses of the mangroves are the contributions they make to human welfare while sustaining the ecosystems. Mangroves play an important ecological role on the coasts in bays and around lagoons.

They are said to reclaim land and protect the shore from erosion. Because of the prop roots they accelerate the process of sedimentation.

Mangroves are the feeding grounds of many marine fish and prawn species and it has been shown that in coastal areas where mangroves occur fish and prawn catch is higher than those areas denuded of mangroves. Many marine fish spawn off-shore but their eggs and larvae drift into the mangroves to spend their juvenile stages there.

The nutrients released by the decaying leaves enrich the mangrove waters. Once these leaves fall into the swamp floor, they decompose by the action of numerous micro-organisms in the soil, and end up as protein rich particles, the detritus. These detritus particles are flushed into the coastal and some times into the offshore waters. They are then taken as food by tiny aquatic animals which form the basic component of the food chains. The majority of the mangrove invertebrates are deposit or detritus feeders.

The decomposition of litter also releases nitrates, phosphates and silicates into the waters which enhance the growth of algae. These algae become food for herbivores.

The importance of Mangrove Forests in Sri Lanka has now been realised by the Government and institutions such as the Forest Department, NARA and the Universities of Colombo and Peradeniya and the Open University have undertaken to do research studies on various aspects of the same. There is a International Union for Conservation of Nature and Natural Resources project of the conservation and management of mangroves in Sri Lanka, funded by NORAD in collaboration with various institutions and departments and based at the Forest Department.

All of us citizens of Sri Lanka in turn in our small way also should contribute in protecting this valuable resource - our Mangrove Forests.

