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Green Coast

For nature and people

after the tsunami

MANGROVE

Facts

1. Mangrove-associated fish contribute around 30% of annual finfish resources (excluding fish by catch).
2. Mangrove-dependent prawns provide resources.
3. Conversion to shrimp/fish ponds, in addition to settlements, agriculture, salt beds, overexploitation and other factors, have led to high rates of mangrove loss.
4. Shrimp pond construction in mangroves, many of these farms has collapsed due to diseases. The ponds were subsequently abandoned.

***Saving* the mangroves**

Mangrove Plantation

Coastal Cleanup

Nursery areas for coastal and offshore fisheries

Improvement of fisheries catches by restoring habitat

Visiting Mangrove

- Visitors to these areas should bring sufficient water, food, an umbrella (for rain or sun) or raincoat, mosquito repellent, binoculars, camera, cap, and a backpack with a towel and a change of clothes. It is best to dress in light cotton clothes as it can be very humid, especially on sunny days and wear comfortable walking shoes.
- Many mangrove animals are shy and require patience to observe, which is best done alone or in a small group. Settle down comfortably in a quiet spot and do not move. You will be surprised at the animals that will begin to appear.

What is a *MANGROVE*?

Mangroves are inter-tidal communities of tropical and subtropical trees and shrubs growing in salt to brackish water and in predominantly muddy or sandy substrates, and protected coastlines.

Ecosystem

Abiotic components

Mangrove soil transported as sediment and deposited by rivers and the sea. Soils are made up of sand, silt and clay in different combinations, and 'mud' actually refers to a mixture of silt and clay, both of which rich in are organic matter. Soil condition is one of the contributing factors of donation among animals and plants, e.g., different species of Fiddler crabs thrive in different soil conditions, and while plants like *Avicennia* do well in sandy area, *Rhizophora* copes better with soft horn's-rich mud.

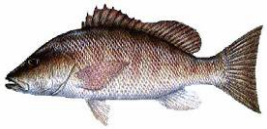
Oyster (*Crassostrea* spp.) Family Ostreidae The name oyster is used for a number of different groups of mollusks which grow for the most part in marine or brackish water. The shell, usually highly calcified, surrounds a soft body. Gills filter plankton from the water, and strong adductor muscles are used to hold the shell closed.

Mud crab (Scylla *serrata*) Mud crabs are large crabs with a smooth, broad carapace. They have 9 even sized teeth on each side of their

eyes. Their two hind legs are flattened for swimming. In the most common form, the color varies from very dark brown to mottled green. The other, generally smaller form has a deeper body and is reddish brown.

Orange-spotted grouper (*Epinepheus coioides*)

Asian sea bass (*Lates calcarifer*)



Red snapper (*Lutjanus argentimaculatus*)

They occur naturally locally, these familiar table fish are also raised commercially in fish cages from fingerlings imported from neighboring countries.

Other biotic component in mangrove

Agarophyte seaweed (*Gracilaria* spp.) is a genus of red algae (Rhodophyta) notable for its economic importance as an agarophyte, as well as its use as a food for humans and various species of shellfish. Various species within the genus are cultivated in various parts of the developing world, including Asia.

Cockle (*Anadara* spp.) is the common name for bivalve mollusks of the family Cardiidae. The shells are a

common fixture on many beaches throughout the world. The distinct rounded shells are symmetrical, heart-shaped and feature strongly pronounced ribs.

Mussel (*Perna viridis*)

The mussel's external shell is composed of two halves that protect it from predators and desiccation. Protruding from a valve is an enlarged structure called the umbo, which indicates the dorsal surface of the mussel.

Biotic components

Following Tomlinson (1986), the mangrove species possess the following attributes:

- They are obligate inhabitants of the mangrove ecosystem and cannot be found elsewhere;
- They have a major role in the structure of the mangrove community and can form pure stands;
- They are morphologically adapted to their environment (e.g. having aerial roots and vivipary of the embryo);
- Can withstand saline conditions, with a physiological mechanism for salt exclusion (e.g. by excretion) so that they can grow in sea water; and
- Are taxonomically distinct from terrestrial relatives, being separated at

least at the generic level.

Why they are important?

Because there are many benefits the mangrove provides for both man and nature.

- Produce leaf litter and other detritus that support coastal food chains
- Provide nursery and feeding ground for fauna, including commercially valuable fish, shrimp, crab, gastropods and bivalve species
- Provide timber and fuel wood for coastal dwellers
- Provide other products like honey and medical drugs
- Help protect coasts and river banks from erosion
- Help protect coastal dwellers from storm surges
- Help reduce peaks of nutrient and sediment discharges from coastal rivers
- Help trap sediment and build new land
- Help reduce atmospheric CO2 levels by fixing and storing carbon
- Enhance biodiversity

- Provide aesthetic and recreational values

Red claw (*Sesarma mederi*) Family Grapsidae

Found in Southeast Asia with size up to 4cm. Adequate Environment is vivarium, with possibilities to lay eggs in salt water

Cerithidea scalariformis is the largest genus in the Potamidinae. Moreover, the important economic aquatic animal species are found in coastal area also. The radula lacks cusps on the lower basal plate of the rachidian tooth.

Boleophthalmus boddarti (**Boddart's goggle-eyed goby**) Occurs in burrows and is often found on mudflats in extremely shallow water where it browses on algae.

Some **economic aquatic animals** which found in this area culture in cage, pen or long line found.

Penaeid shrimps (*Penaeus* spp.) *P. monodon*, is a marine crustacean that is widely reared for food. It is the most widely cultured prawn species in the world,

***Animals* in mangrove**

The organically rich mangrove ecosystem supports over 150 species of fish. It is also a nursery ground for many commercially important aquatic animal species.

Mud Lobster (*Thalassina anomala*) Size: up to 30cm, Indo-West Pacific, common but rarely seen.Mud lobsters help bring up organic matter from deep underground and the recycling of nutrients in the ecosystem. The huge mounds (which may be up to 3 m in height) are also key habitats for many animals.

Carcinoscorpius rotundicaud Mangrove horseshoe crab Size: up to 40 cm in length (plus tail). They are basically scavengers, but they also feed on bivalves. They are found throughout Southeast Asia. The telson or tail is used to right itself up when overturned and not as a weapon as some believe

Fiddle crab Within the

genus Uca and belonging to the family Ocypodidae. Reaching a diameter of between 2 and 4½ cm (1–2 inches), fiddler crabs may be tan, blue-green, turquoise, black, yellow, or orange in color. Found in mangroves and on sandy or muddy beaches.

Roots act as lungs seeking out air?

An aerial root may be defined as a root which, for part of the day at least, is exposed to the air. There is little air available under the water and in the mud so the plants have had to establish root systems that can adapt to the harsh environment

Pnematophores are erect roots that are some form of upward appendage or extension of the underground root system. These roots are exposed at least part of the day to air and not submerged underwater.

Prop Roots can arise from the trunk and lower branches. *Stilt Roots* are prop roots which anchor in such a way that they look like a stilt or a “Flying Buttress”, they improve the stability of an older tree by providing a broader base and support in the soft and unstable mud.

Kneed Roots grow just below the soil and periodically grow vertically upwards then immediately loop downwards to resemble a bent knee.

Plank Roots These horizontal roots grow vertically upwards on the upper side for the entire length of the root. They curve in a snake like fashion. The exposed vertical portions help in the aeration.

Mangrove trees

The composition of mangrove forest encompasses a variety of plants; Thailand is

home to 74 species of trees and shrubs in 35 different families. Most of dominant and economically important species are found in the family Rhizophoraceae, especially under the genera, Rhizophora, Ceriops, and Bruguiera.

Family Rhizophoraceae

Rhizophora apiculate Bl. Leaf blades elliptic, tiny black-spotted below, leaf stalks and stipules often tinged

red. Stalk less flowers cream colored, in pairs, on a short, stout, dark grey stalk. Fruit brown, upside-down pear-shaped, crowned by the persistent sepals.

Rhizophora mucronata Poir Tree is up to 15 m tall, rarely over 3 m. Leaves opposite, blades oblong, tiny black-spotted below, leaf stalks and stipules often yellowish; stalked flowers, 2-14 per inflorescence on a long, slender, yellow stalk; seedling viviparous, hypocotyl about 60 cm long or more, warty, with pointed tip.

Tree up to 20 m tall with buttresses and kneed pneumatophores; bark grey, smooth; leaves opposite, blades light green, thin, elliptic; stipules pale yellow or

Bruguier cylindrical Bl.

greenish. They can grow on newly formed soils unsuitable to other mangroves, leaving better soils to the other species.

Ceriops. tagal (Perr.) C.B.Rob. Shrub or rarely tree, to 7 m tall; shortly buttressed; bark light grey, fairly smooth; twig tips flat, formed from the stipules. Leaves opposite, blades dark green in shade, shiny, bright greenish yellow in full sun, upside down egg-shaped, oblong to elliptic, tip rounded or notched, stipules flattened at branched tips.

Family Avicenniaceae

Avicennia alba Bl. Tree or shrub, to 20 m tall; bark dark grey

(black when wet), smooth. Flowers are in cross-like inflorescences; petals yellow. Pneumatophores are about 20 cm tall, pencil-like.