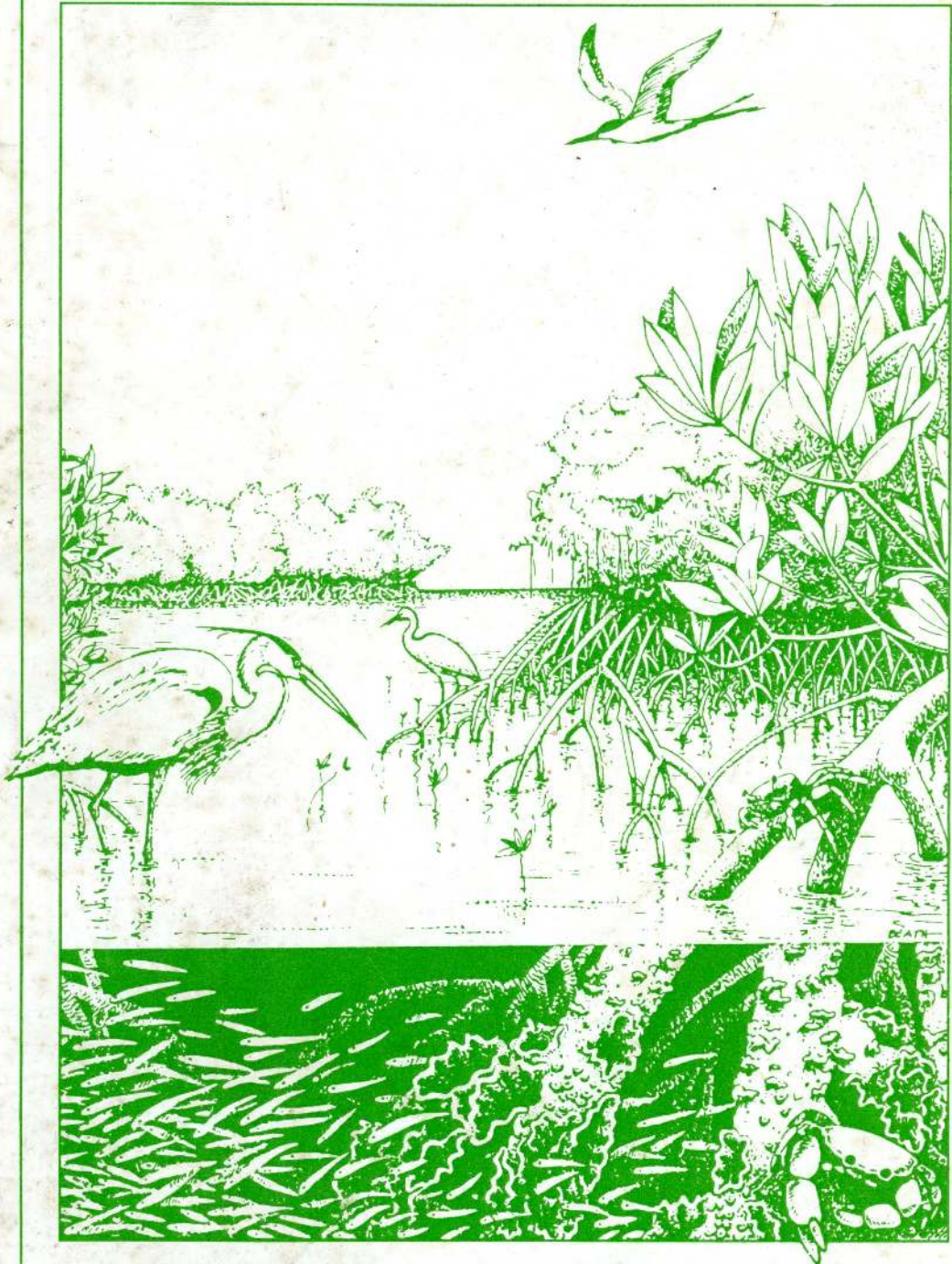


SRI LANKA'S MANGROVES



COAST CONSERVATION DEPARTMENT

Produced by the Coastal Resources Management Project (Sri Lanka)

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WHAT ARE MANGROVES?

Mangroves are Woody, seed bearing, highly specialised plants ranging in size from shrubs to tall trees. They occur along sheltered intertidal coastlines in association with estuaries and lagoons.

Mangroves are characterised by their ability to grow on land periodically flooded by seawater, and in anaerobic and acidic soils. Although Mangroves grow in saline environments, they have the usual plant requirements for freshwater, nutrients, oxygen and sunlight. Many of the individual species possess unique adaptations which enable them to thrive in an environment where other plants cannot grow. Associated with this vegetation are many species of fish, crustaceans and molluscs.

SRI LANKA'S MANGROVES

The mangroves in Sri Lanka are composed of 25 species of true mangroves and 15 species of mangroves association. The most extensive mangroves occur in Puttalam-Kalpitiya area in association with estuaries. Dense localized stands also occur in association with estuaries in the southern, south western and north eastern coasts e.g. Koggala lagoon, Kalametiya lagoon, and Kokilai lagoon, Location of mangroves areas are show in fig 17.

KNOW THE COMMON MANGROVE PLANTS



Fig .1

Rhizophora mucronata (Kadol) Fig 1

Mangrove tree with prop roots growing on the waters edge. Leaf apex is mucronate, bright green above and paler beneath with many minute red spots. The flower has 4 sepals, and 4 petals with long stalks. Seeds are viviparous. *R. apiculata* looks like *R. mucronata* but can be easily distinguished from, it by the sessile flowers, leaves dark green above and paler beneath.

Bruguiera gymnorhiza (Malkadol, Sirikanda) Fig 2

B. gymnorhiza can be identified by the viviparous seeds and the red coloured calyx with 12 -16 sepals. In *B. sex angula* there are 10-12 sepals which are yellow in colour *B. cylindrica* also has viviparous fruits but there are only 7-8 green sepals. comparatively smaller in size.

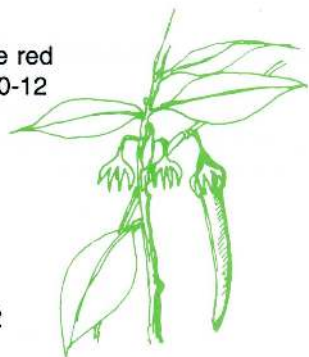


Fig .2



Fig .3

Ceriops tagal (Punkanda / Rathugas) Fig 3

C. tagal flowers are small and greenish yellow.

There are 5-6 petals and sepals.

The viviparous fruits have a thin and long hypocotyl.



Fig .4

Sonneratia caseolaris (kirilla) Fig 4

They have stumpy pneumatophores.
There are 6-9 green sepals and 6 petals in the flower.
S. caseolaris flowers are red and *S. Alba* flowers are white. The fruit has a persistent calyx and style.



Fig .5

Avicennia marina (Manda / Madagas) Fig 5

Trees with pencil-like pneumatophores.
Flowers are yellow and emit the fragrance of bee's honey, *A marina* leaf apex is pointed and *A. officinalis* leaf apex is rounded.

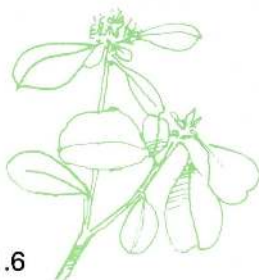


Fig .6

Aegiceras corniculatum (Heenkadol / Averi kadol) Fig 6

White flowers are borne on slender stalks.
There are 5 petals and 5 stamens inserted in the corolla tube. The viviparous fruit is curved.



Fig .7

Acanthus ilicifolius (Mulli / Katu ikkili) Fig 7

Shrub with thorny leaves and stem.
The sessile flowers are purple. Calyx has 4 sepals and the fruit is a capsule.



Fig .8

Excoecaria aggalocha (Thela) Fig 8

Dioecious trees with latex. Mature leaves are red.
Male flower occur in the axils of leaves. Female flowers occur on branches, as spikes
There are 3 sepals, 3 stamens and no petals.



Fig .9

Xylocarpus granatum (Mutti kadol) fig 9

Small trees with dark brown petiole and bark. Flower are borne on long branches. They have 4 sepals and 4 petals. The Fruit is large and round with corky, leathery covering.

Nypa fruticans (Gin pol) Fig 10

The only mangrove palm with an inflorescence forming a large fruiting head.



Fig .10



Fig .11

Lumnizera racemosa (Bariya) Fig 11

Small tree with purplish bark and spirally arranged leaves. Flowers are white. with 5 petals. Calyx green with 5 sepals. 5-10 stamens.



Fig .12

Common mangrove associates.

Acrostichum aureum (Karen koku) Fig 12

The only mangrove fern.Has erect rhizome. Leaves are pinnate and leathery. Sori are found along the veins.

Heretiera littoralis (Etuna) Fig 13

The leaves are green on the upper surface and silvery below.
The unisexual flowers are yellowish green and bell shaped.The flower has 5 sepals but no petals.The fruit has a keel.

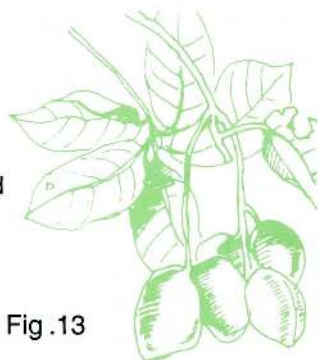


Fig .13

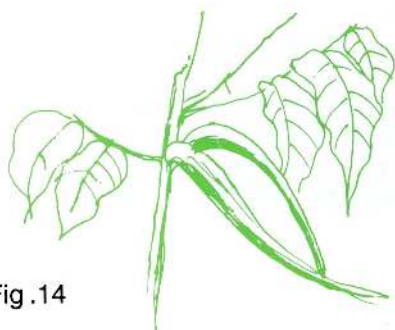


Fig.14

Dolichandrone spathacea (Diya danga) Fig 14

Trees with glossy leaves. 3 - 4 flowers occur in clusters. Flowers are white with a long corolla tube. The fruit is a follicle, about a foot long.

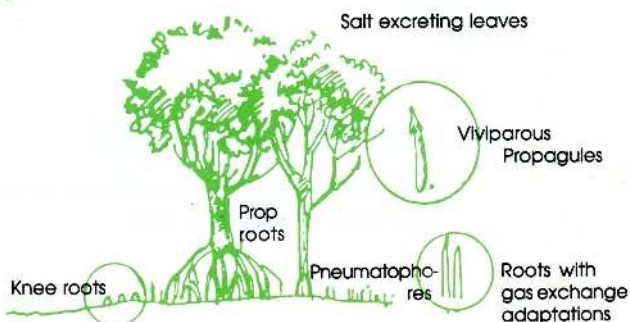


Fig.15

ADAPTATIONS OF MANGROVE PLANTS

Mangrove plants are woody, halophytes specialized to live in a saline environment. They have specialized adaptations to live in this harsh conditions of the mangrove environment.

Prop roots and stilt roots

Since mangroves live on a loose substrate, there are prop roots arising from the branches and stilt roots arising from the main stem to anchor the plants to substrate (Fig 15).

These roots also help to filter out the salt entering the plants. e.g. *Rhizophora*

Salt secreting glands

Some mangrove species have salt secreting glands through which excess salt is removed from the plants e.g. *Avicennia*, *Acanthus* and *Aegiceras*

Xeromorphic leaves

In order to avoid water loss through transpiration, the cuticle is thick and the water storage tissue is extensive.

Air breathing roots

Since mangrove soil is poor in oxygen, air breathing roots or pneumatophores grow upwards from the soil surface. Gas exchange takes place through the opening of these roots, e.g. *Avicennia*, *sonneratia*.

There are also knee-roots that grow upwards from the soil surface in the form of bent knees which are capable of breathing air e.g. *Bruguiera*.

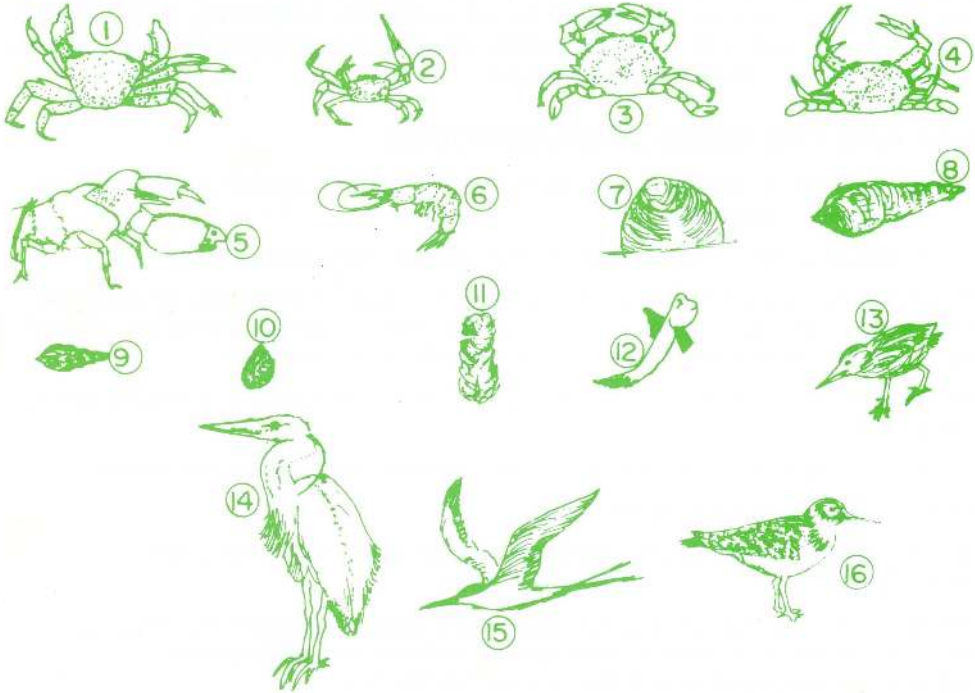
Vivipary

To meet the hostile conditions of the environment, viviparity is another adaptation to ensure a late developmental stage of the embryo when it is released from the mother plant' e.g. *Rhizophora*, *Bruguiera*, *Ceriops*, *Aegiceras*.

KNOW THE COMMON MANGROVE ANIMALS

Some of the common mangrove animals are shown in Fig16 and their names listed below:

Fig 16.



Key to Fig 16.

1. Grapsid crab - mada kakuluwa
2. Fiddler crab - thani andu kakuluwa
3. Lagoon crab - (*Scylla serrata*) - kalapu kakuluwa
4. Sea crab (*Portunus pelagicus*) - sinakkali
5. Mud lobster (*thalassina anomala*) mada pokirissa
6. White prawn (*Penaeus indicus*) - kalissa
7. Mangrove clam (*Geloina coaxans*) - mutti
8. Telescope shell (*Telescopium telescopium*)
9. Mudflat shell (*Cerithiidea cingulata*) - uri
10. Mangrove periwinkle (*Littoraria scabra*) - kadol bella
11. Mangrove oyster (*Saccostrea. / Crassostrea sp.*) - kavati
12. Mud skipper (*Periophthalmus*) - Diya huna
13. Little green heron (*Butorides striatus javanicus*) - kadol koka
14. Egret (*Egretta*) - Ali kokka
15. Terns and gulls - Mudu lihiniya
16. Sand pipers - Silibilan.

ADAPTATION OF MANGROVE ANIMALS

Most mangrove crabs belong to the family grapsidae and ocypodidae. They are semi-terrestrial and live in burrows which invariably terminate below the water table. When they come out of the burrow they can remain on land for a long time because their branchial chamber can be kept moist for a long time. Burrowing is an adaptation found in many mangrove animals. The Mudskipper is a fish unique to mangrove. Its eyes, gills, fins and the tail modified for terrestrial life. It uses its pelvic and pectoral fins to skip and climb. Mangrove oysters are capable of getting attached to mangrove roots. They close their shells as the tide recedes.

WHAT ARE THE USES OF MANGROVES

From time immemorial mangroves have been used by coastal communities to provide many of their needs. Some of these are :

- * Several species of fish, prawns, crabs and molluscs are harvested.
- * Mangrove timber is used as fuelwood, for beams and poles in structures, for construction of fish traps, fish kraals and brush piles, as boat building materials and as tool handles and furniture. Mangrove timber is strong and resistant to insect attacks.
- * The bark of *Rhizophora* sp. and *Ceriops tagals* is used for extraction of tanning for dyeing fishing nets.
- * The bark of *Bruguiera* is crushed and used as a poultice for minor cuts and injuries.
- * Leaves of *Avicennia* serve as green fertilizer.

Mangrove ecosystems provide other important services to coastal communities. Some of these are:

- * They serve as nursery grounds for fish, prawns and crabs and support fisheries production in coastal water. Adults of many of these species live in the sea, while juveniles migrate to the mangroves to feed and then return to the sea.
- * They produce leaf litter and detrital matter. The leaf litter is broken down by bacteria, fungi and other micro-organisms which in turn are a valuable source of food for marine animals in estuaries and coastal waters.
- * They protect the shore of the lagoons and the estuaries from erosion.
- * They reduce pollution of nearshore coastal waters by trapping and absorbing pollutants.
- * They are important recreational grounds and provide opportunities for bird watching.
- * Because of the high diversity of mangrove plants and animals, and their adaptations, they are ideal field laboratories for biology students.

LET'S PROTECT OUR MANGROVES

Over the past thirty years or so, Sri Lanka's coastal zone has witnessed a rapid conversion of its mangroves for various uses such as aquaculture and housing development. This combined with pollution has reduced the benefits of the mangrove habitat for fisheries and sustainable fuelwood production.

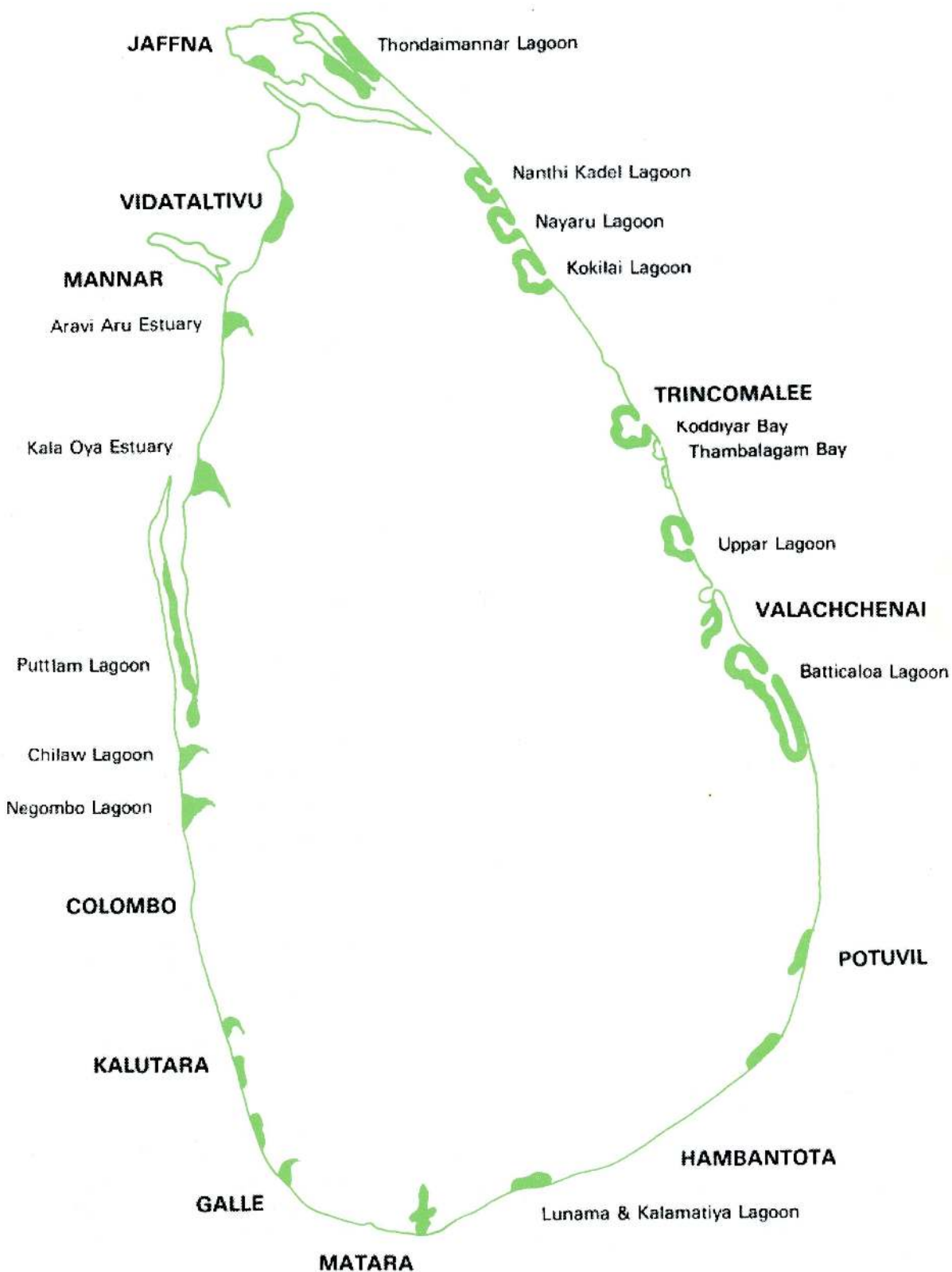
Mangroves are not "wastelands" or "marginal lands" of little or no value waiting to be "developed". They are one of the most valuable natural resources of Sri Lanka.

If you live near mangroves, remember that

- * Mangrove areas should not be cleared for housing, aquaculture or other development.
- * Mangrove trees should not be haphazardly cut down to provide fuelwood or construction material.

Sri Lanka's limited mangrove resources are threatened. Let's refrain from further destruction. Our government agencies, universities and non governmental organisations are now working together to ensure sustainable use of mangrove resources. Let's plan to replant and restore Sri Lanka's mangroves for the future.

Fig 17. DISTRIBUTION OF MANGROVE VEGETATION IN SRI LANKA.



Mangroves along with coral "reefs," estuaries and seagrass beds are natural habitats that contribute to the value of Sri Lanka's coastal zone. For more information about these habitats and their management, please write to:

Coast Conservation Department
4th Floor, Maligawatta Secretariat
Colombo 10.
Phone : 011- 2449754-57
