Man depends on wetlands

Human civilization around wetlands systems

Prehistoric & historic temples situated near wetlands form remnants of such civilization

Man depends for drinking water, agriculture, fishing water transport, tourism, water sports etc.

Productive Ecosystem

– Cradles of Biological Diversity
Kerala – 3,28,402 hectares wetlands

- 3 designated Ramsar sites

- Ashtamudi backwater
- Sasthamkottah lake
- Vembanad kayal

National Wetland Conservation Programme

- Kottuli in Kozhikode
- Kadalundi in Kozhikode & Malappuram District.
Plants of wetlands have played fascinating roles in life

- Rhizomes of *Nelumbo macifera*
- Fruits of *Nymphaea nouchali* - food
- *Bacopa monnieri*
- *Centella asiatica* - medicine
- *Eclipta alba*
- *Lagenandra toxicaria* - water purifier
- *Nelumbo nucifera* - worship
- *Typha angustata* - thatching
- *Pandanus fascicularis*
- *Cyperus pangorei* - mats & baskets
Aquatic Ecosystem

- Fast diminishing ecosystem
  - Filling
  - Industrial discharge
  - Heavy slitting
  - Exotic weeds

- Rich specialized aquatic biodiversity in fast disappearing
Plate - 1

a. Muthappan temple at Parassinikkadavu along the banks of Valapattanam river

b. A temple pond in Calicut (Sreekandeswaram temple)

c. Filling of a wetland for road construction

d. Excessive growth of the exotic weed *Eichhornia crassipes* in an aquatic situation

e. Pookot Lake: a water body being used for tourism in Wayanad

f. Fishing harbour at Chaliyam developed at the coast of rich mangrove vegetation
Dense mangrove vegetation at Valapattanam estuary in Kannur district

Dumping of inorganic city wastes into water sources: a view from Canoli canal

A timber yard at Kallai river developed damaging the mangrove system there

The much polluted water of Canoli canal. A patch of *Moriscus javanicus* which tolerates the toxic substances is seen growing in it.

*Pandanus odorattissimus* forming prohaline type of estuarine vegetation

A dense riparian vegetation at Kalikkadavu in Kasaragode district
Aquatic Vegetation – Based on habitats

1) Free-floating hydrophytes

- Live on the surface of water, in contact with air, stagnant water
  - *Eichhornia crassipes*
  - *Hygroryza aristata*
  - *Lemna perpusilla*
  - *Pistia stratiotes*
  - *Spirodelapolyrhiza*
  - *Wolffia globosa*
Aquatic Vegetation – Based on habitats

2) Suspended hydrophytes

- plants anchored and submerged in young stage but later get detached from their roots and lie below the surface of the water, can not survive in fast flowing water, restricted to stagnant ponds, tanks.
  - *Ceratophyllum demersum*
  - *Eriocaulon setaceum*
  - *Hydrilla verticillata*
  - *Utricularia aurea*
Aquatic Vegetation – Based on habitats

3) Submerged - anchored hydrophytes

- Plants well below the surface of water usually anchored. Found both in stagnant and running water.
  - *Aponogeton appendiculatus*
  - *Blyxa auberii*
  - *Cabomba caroliniana*
  - *Ottelia alismoides*
  - *Vallisnaria natans*
Aquatic Vegetation – Based on habitats

4) Anchored hydrophytes with floating leaves

- Plants usually met within shallow stagnant waters. Tide over unfavourable periods by perennial organs like rhizome, tubers, stolens etc. Characterized by dimorphic leaves – juvenile submerged and mature floating.

- *Aponogeton natans*
- *Nelumbo nucifera*
- *Potomogeton nodosus*
- *Sagittaria guayanensis*
Aquatic Vegetation – Based on habitats

5) Anchored hydrophytes with floating shoots
   - plants attached to substratum, branches trail or creep along water surface, often rooting at nodes, stagnant waters
     - *Geissaspis cristata*
     - *Ipomoea aquatica*
     - *Ludwigia adscendens*
     - *L. sedoides*
     - *Neptunia prostata*
     - *Trapa maximowiczii*
Aquatic Vegetation – Based on habitats

6) Emergent - Anchored hydrophytes

- Plants anchored to substratum under water, but produce aerial shoots projecting well above water. Inhabit shallow stagnant water.
  - *Acorus calamus*
  - *Aeschynomene aspera*
  - *Bacopa monnieri*
  - *Eleocharis spiralis*
  - *Hydrocera triflora*
  - *Limnocharis flava*
  - *Limnophila aromatica*
  - *L. heterophylla*
  - *Monochoria vaginalis*
Pandanus grove at MBG
Wetland at MBG
Preparation of data sheet -

On distribution, flowering time, local uses.

- Field Exploration trips.
- Information on local names, uses, digital images.
- Water samples - $\text{pH}$ value recorded.
- Plant specimens – Processed into herbarium species.
- Live seedlings of non weedy/RET – Collected and introduced in garden.
- Delicate aquatic plants – Primarily introduced in special germination pots for adjusting $\text{pH}$ - shifted to conservatory.
- Plant specimens identified under stero dissection Microscope.
Collection Trips
Lagenandra nairi

- Endemic to South India

- Endemic to South India
Bruguiera gymnorhiza
Monochoria vaginalis Presl.

- For burning sensation of body
- Gastropathy, asthma, scurvy & haemorrhage
Murdania loriformis

- Wetland and moist places
- Asthma
Trapa natans var. bispinosa

- Photosynthetic root
- Haemorrhages, diarrhoea
Neptunia prostrata

- Shoots are edible
- Earache and syphilis
NEPTUNIA -- SPONGY TISSUES
Ottelia alismoides

- Aquatic herb
- Eaten in South-East Asia
Hygrophylla diformis

- Dimorphic leaves
- Aquarium plant
Hydrocharis dubia

- Himalayan regions
Lagenandra toxicaria

- Endemic to Western Ghats
- Renal troubles and cardiac ailments
Pistia stratiotes L.

- Antiseptic, anti dysenteric and cure for asthma
- Fed to ducks and pigs in Bengal
Ipomoea aquatica

- Shoots are edible
Utricularia aurea

- Carnivorous plant
Rotala malampuzhensis

- Only in Kerala rice fields
Rotala malabarica

- Endemic to South-West India
Nuphar lutea

- European aquatic plant
- Recently distributed in India as a garden plant
NUPHAR LUTEA
Pimpinella heyneana

- A rare plant restricted to India, Myanmar and Srilanka
- Wet forest ground
Myriophyllum indicum

- Endemic to South East Asia and Srilanka
- In ponds and low land marshes
Lemna minor

- Foul waters
- Cleans the organic impurities
Equisetum ramosisimun

- Aquatic fern
- Rare in Kerala
Hydrocera triflora

- Annual and perennial herb found in shallow water
Wolffia globosa

- Smallest angiosperm
- Flowers are microscopic
**Limnopoa meeboldii**

- It grows bottom rooted and floating in coastal lagoons
- Endemic to coastal south-west India
Eriocaulon heterolepis

- Endemic to Western Peninsular India
Euryale ferox

- Annual or short lived perennial
- The seeds, fruits, and rhizomes are eaten locally by humans