SPECIES DIVERSIFICATION IN MANGROVE BASED ECOSYSTEM OF KANNUR DISTRICT, KERALA, INDIA

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Organic Life
Trivandrum, Kerala
India
Temperature hit a record-breaking 51°C in the city of Phalodi, Rajasthan
-The Independent

Global warming increases 'food shocks' threat
BBC-14 August 2015
Summer heat melts roads in Gujarat’s Valsad district
-DECCAN CHRONICLE. May 23, 2016

7 dams go dry in Marathwada- India Today
Chennai: 50 mm rain in 60 minutes causes havoc in the city
DNA, India, Tue, 24 Nov 2015

Antarctica’s Ice Is Being Carved Up From Below
Rising sea level: it’s time to act
THE HINDU, May 1, 2016

Massive disaster happened in the mussel farms of Kasaragod during 2015-16
ERRORS WE MADE
UPCOMING THREATS

Latest assessment by WHO-
- Climate change is likely to kill 2,500,000 more people each year by 2030.
- Most of the death will be due to epidemics, heat stress and malnutrition.
- Death due to childhood malnutrition are projected to 95000.
- In the next year heat exposure will cause around 38000 deaths.

SOLUTIONS

- Efforts should take to promote low carbon health care facilities and technologies.
- Should take measures to reduce global warming.

HOW?

- HIGH “CARBON CONSERVATION”
  “CONSERVE THE NATURAL CARBON STORE”
- LOW “CARBON EMISSION”
  “REDUCE THE USE OF FOSSIL FUELS”
MANGROVE FACTS

- One of the most productive wet land ecosystem.
- Cover the globe, where no vegetation is possible i.e., in the tidal areas of estuaries.
- Occupies less than 1% of the world surface.
- Evidences show, existence since 30 to 40 million years ago.
- The word “Mangrove” compiled from “Mangue” (Portuguese- tree bush), “Grove” (English).
ENVIRONMENTAL BENEFITS

➤ Assessed to produce 29 to 75 tones/hector of biomass.
➤ Microbes of mangroves ecosystem can fix 20g nitrogen/ m2.
➤ One among the most carbon rich forest in the tropics (1.023 mg carbon/ hector).
➤ Nearly 29.5% of net primary production is exported to the marine eco-system.

ENVIRONMENTAL BENEFITS cont.

➤ The organic carbon stock of the “above-ground biomass” in this ecosystem is 62 Mg/ha/year.
➤ This “natural sewage treatment plant” have the ability to metabolize organic waste.
➤ Capable of removing excessive nutrients in the shrimp farms (70% for NO3- N and NH4-N).
SOCIO-ECONOMIC BENEFITS

- Average yield of fish and shell fish are estimated as nearly 90 Kg/ha to 220Kg/ha (FAO 1995).
- This coastal bio shield gave protection to the lives of people:
  - During “Chakaria Sundarbans” in Bangladesh (1960).
  - Tsunami of 2004 in Pichavaram, Tamil Nadu.

SOCIO-ECONOMIC cont.

- Play vital role in moderating monsoonal tidal flux in the estuarine.
- Traditional communities collect:
  - Fuel wood
  - Fodder
  - Honey
  - Medicinal plants
  - Timber
GLOBAL DISTRIBUTION

North & Central America - 15%
Africa - 20%
Asia - 42%
South America - 11%
Oceania - 12%

MANGROVES IN INDIA

West Bengal - 2110800 ha.
Gujarat - 93600 ha.
Maharashtra - 15800 ha.
Goa - 1600 ha.
Kerala - 2189 ha.
Tamil Nadu - 3500 ha.
Andaman - 63700 ha.
Orissa - 20300 ha.
AP - 328000 ha.

Kerala – An overview

- Formed on 1st November 1956
- 14 Districts
- Occupies almost 7% of India’s coastline (589.5 kilometers).
- Arabian Sea on the west and Western Ghats on the east.
- Area: 38,863 square kilometers.
- Population: 33,606,061
- Population density: 859/ Sq.Km
- Sex ratio: 1084: 1000
- Literacy rate: 92.66%
- Rivers: 44
- Freshwater resources: 1,35,564 ha.
- Brackish water resources: 1,15,968 ha.
- Mangrove Area: 2189 ha.

MANGROVES OF KERALA

- *Aegiceras corniculatum*
- *Avicennia marina*
- *Avicennia officinalis*
- *Bruguiera cylindrica*
- *Bruguiera gymnorhiza*
- *Bruguiera sexangula*
- *Ceriops tagal*
- *Excoecaria agallocha*
- *Excoecaria indica*
- *Kandelia candel*
- *Lumnitzera racemosa*
- *Rhizophora apiculata*
- *Rhizophora mucronata*
- *Sonneratia alba*
- *Sonneratia caseolaris*

- 33 mangrove associates are also prevailing along in the Kerala coastal.
KANNUR - "THE LAND OF MANGROVES"
Holds about 82% of Kerala's mangroves

MAJOR SPECIES
- Rhizophora mucronata
- Bruguiera cylindrica
- Lumnitzera racemosa
- Aegiceras corniculatum
- Acanthus ilicifolius
- Avicennia officinalis
- Avicennia marina

- Costal Distance: 82 Km
- Area 2,966 Km²
- Population 2,412,365
- Density 813 / Km²
- Literacy 92.80 %
- Mangrove area 529.25 ha

- Major mangrove zones: 24
- Fin fishes and shell fishes: 14
- Butterfly species: 33 Nos
- Molluscs: 20 species
MAJOR MANGROVE ZONES- KANNUR

MADAKKARA MANGROVE FOREST
DHARMADAM AREA

KOWWAYIKKAYAL
NATIVE MANGROVE SPECIES EXCLUSIVELY FROM KANNUR

- Sonneratia alba
- Aegiceras corniculatum
- Rhizophora mucronata
- Lumnitzera racemosa

FAUNAL DIVERSITY
MANGROVE AFFORESTATION-RESOURCES NEEDED

• **Natural resources:**
  – Favourable environmental conditions

• **Socio-economic resources:**
  – Ample public awareness of the importance of mangroves.

• **Institutional/Scientific resources:**
  – Knowledge of appropriate afforestation techniques/mass multiplication/Germplasm conservation.

MANGROVE CONSERVATION INITIATIVES- IN KERALA

- **Afforestation programmes** by Department of Forest, Government of Kerala and NGOs.
- **Germplasm** conservation/Awareness programmes/
  **Mangrove Nursery**- Mangrove Research Centre, Puduveypu (KUFOS).
VARIOUS MANGROVE AFFORESTATION PROGRAMMES

Department of Forest-Kannur

Apollo Tyres and Wildlife Trust of India - Kannur

MANGROVE RESEARCH CENTRE-PUDUVEYPU, KERALA

- Part of Fisheries Station, Kerala University of Fisheries and Ocean Studies.
- Started on 1/8/2012.
- Mandate:
  - To conserve the most important mangrove varieties.
  - To establish a Germplasm centre of mangrove and mangrove associate.
  - Conduct awareness programmes on Mangroves and Fisheries.
  - To take up research programmes on mangroves, especially in the line of bio-active compounds present in these plants.

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PRESENT SCENARIO

"Conserve Our Carbon Stores"-mangroves
THANK YOU...