

An Overview of Latest Information in Relation to Mangrove Ecosystem - India

Manickavasagam Samiyappana¹, Ponmani Muthub², Mari Selvam Muruganb² and Nirmal TC³

¹Assistant Professor, TNJFU-DSA, Thanjavur Centre for Sustainable Aquaculture, Thanjavur -Tamil Nadu

²TNJFU - Fisheries College and Research Institute, Thoothukudi -Tamil Nadu

³Assistant Professor, School of Fisheries, Centurion University of Technology and Management, Odissa

SUMMARY

A mangrove ecosystem is the interface between terrestrial forests and aquatic marine ecosystems. The ecosystem includes diversified habitats like mangrove-dominant forests, litter-laden forest floors, mudflats, coral reefs and contiguous water courses such as river estuaries, bays, inter-tidal waters, channels and backwaters. A mangrove ecosystem is the interface between terrestrial forests and aquatic marine ecosystems. The ecosystem includes diversified habitats like mangrove-dominant forests, litter-laden forest floors, mudflats, coral reefs and contiguous water courses such as river estuaries, bays, inter-tidal waters, channels and backwaters. Some mangrove plants exclude salt by having very impermeable roots that function as an ultra-filtration system to keep sodium salts out of the rest of the plant, effectively lowering the salt content by 90% – 97%. Mangroves are found worldwide, but the greatest species diversity is in Southeast Asia. Mangrove forests are found in tropical and subtropical regions in tidal areas that are frequently inundated with salt water. Worldwide, mangrove forests occupy about 15.2 million hectares (1,52,000 sq km) of tropical coasts, found across Africa, Australia, Asia, and America. About 40% of the world's mangrove is found in South East Asia which is 6.8% of the world's mangrove cover and India has about 3% of the share of the total Mangrove cover that is found in South Asia.

INTRODUCTION

Mangroves are salt-tolerant vegetation that grows in intertidal regions of rivers and estuaries. They are referred to as 'tidal forests' and belong to the category of 'tropical wetland rainforest ecosystem'. A mangrove ecosystem is the interface between terrestrial forests and aquatic marine ecosystems. The ecosystem includes diversified habitats like mangrove-dominant forests, litter-laden forest floors, mudflats, coral reefs and contiguous water courses such as river estuaries, bays, inter-tidal waters, channels and backwaters. Mangroves are trees and shrub species that grow at the interface between land and sea in tropical and subtropical regions of the world, where the plants exist in conditions of salinity, tidal water flow and muddy soil. The structural complexities of mangrove vegetation create unique environments which provide ecological niches for a wide variety of organisms. Mangroves serve as breeding, feeding and nursery grounds for most of the commercial fishes and crustaceans on which thousands of people depend for their livelihood. Mangroves give protection to the coastline and minimize disasters due to cyclones and tsunami. Recent studies have shown that mangroves store more carbon dioxide than most other forests. Mangroves are a special type of vegetation and they are economically and ecologically significant.

Characteristics of Mangroves

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1.	They represent the littoral forest ecosystem
2.	Low lying areas of tropical and subtropical regions (Between 24° North and 38° South) are home to Mangroves
3.	They are also called Halophytes – They are salt-tolerant
4.	The trees that grow in Mangrove Forests are generally 8-20 meters high. These trees have thick leaves
5.	They are confined to tropical and subtropical regions as they need high solar radiation to filter saline water through their roots
6.	They have blind roots which are called Pneumatophores. These roots help these trees to respire in anaerobic soils.
7.	The seeds of Mangrove Forests trees germinate in the trees itself before falling – This is called viviparity mode of reproduction
8.	Mangrove Forests trees project different types of roots:

	<p>Prop – They are down into the water Air – They are vertically configured up from the mud Stilt – These roots emerge from the main trunk of the tree; also called adventitious roots</p>
9.	<p>There are types of Mangroves: Red – Found along the coastlines (<i>Rhizophora</i> sp) Black – Major feature of such mangrove trees is their dark bark. They have access to more oxygen (<i>Avicennia</i> sp) White – Compared to Red and Black mangroves; they grow at the highest elevation</p>
10.	<p>The major mangroves in India are found at: Sundarban Mangroves Mahanadi Mangroves Krishna Godavari Mangroves Mangroves of Gujarat Ratnagiri Mangroves Goa Mangroves Cauvery Deltaic Mangroves Andaman Nicobar Mangroves</p>

Features of Mangrove Forest

- Some mangrove plants exclude salt by having very impermeable roots that function as an ultra-filtration system to keep sodium salts out of the rest of the plant, effectively lowering the salt content by 90% – 97%.
- The plant then sheds its old leaves, which are concentrated with salt that does collect in the shoot.
- Some mangroves have cell vacuoles that can store salt.
- Other species’ leaves contain unique glands that actively release salt, leaving visible salt crystals on the leaf’s upper surface.
- Many kinds of mangrove trees have airborne roots, known as pneumatophores that draw up oxygen from the air for the roots because the soil in shallow regions of mangrove forests is often flooded during high tides.
- A lot of mangrove plants also have a distinctive way of reproduction. Mangrove seeds begin growing while still attached to the parent plant, known as propagules, these seedlings develop roots as well.

Global Distribution

Mangroves are found worldwide, but the greatest species diversity is in Southeast Asia. Mangrove forests are found in tropical and subtropical regions in tidal areas that are frequently inundated with salt water. Worldwide, mangrove forests occupy about 15.2 million hectares (1,52,000 sq km) of tropical coasts, found across Africa, Australia, Asia, and America. While the mangrove forests are spread across more than 100 countries and territories, three-quarters of the mangroves are found only in 15 countries and less than seven percent of them are protected. Asia has a share of 42 percent of the world’s mangroves, which is followed by Africa (21 percent), North/Central America (15 percent), Oceania (12 percent), and South America (11 percent).It is important to note that the mangrove area decreases with increasing latitude excluding the Sundarbans which account for the world’s largest tract of mangroves situated along the Ganges delta.

Mangroves in India

About 40% of the world’s mangrove is found in South East Asia which is 6.8% of the world’s mangrove cover and India has about 3% of the share of the total Mangrove cover that is found in South Asia”. India’s Mangrove cover has increased by 54 sq km (1.10%) as compared to the last assessment.”As per the current data, mangrove cover in the country stands at 4,975 sq km [(1.2 million acres)], which is 0.15% of the country’s total geographical area. Sundarbans in west Bengal alone accounts for almost half of the total area that is found under mangrove in India. West Bengal has a total of 42.45% of India’s mangrove cover, followed by Gujarat at 23.66%, and A&N Islands at 12.39%. All around the country, Gujarat showed a maximum increase in mangrove forest cover of 37 sq. km.

- West Bengal (2114 sq km),
- Gujarat (1140 sq km),
- A&N Islands (617 sq km),
- Andhra Pradesh (404 sq km)

- Maharashtra (304 sq km)

Among the states, Kerala (9 sq km) and among the UTs, Pondicherry (2 sq km) have the least Mangroves cover. For Research and Development, National Mangrove Genetic Resource Centre was established in Bhitarkanika (Odisha) by the Environment Ministry.

India State of Forest Report 2021

- As per the India State of Forest report 2021, the area under Mangrove forest has increased by 17 sq km making India’s total mangrove cover as 4,992 sq km
- Top 3 states showing mangrove cover increase: Odisha (8 sq km), Maharashtra (4 sq km), and Karnataka (3 sq km)

Important mangrove forest regions in India

Gujarat: Gulf of Kutchh, Gulf of Khambhat, Dumas-Ubhrat

Andhra Pradesh: Coringa East Godavari Delta, Krishna Delta

Odisha: Bhaitarkanika, Mahanadi, Subarnarekha, Devi-Kauda, Dhamra, Chilka

West Bengal: Sunderbans

Andaman & Nicobar: North Andaman, Nicobar

Maharashtra: Achra-Ratnagiri, Devgarh-Vijay Durg, Veldur, Kundalika-Revdnada, Mumbra-Diva, Vikroli.

Goa: Goa

Karnataka: Coondapur, Dakshin Kannada/ Hannavar, Karwar, Mangalore Forest Division.

Kerala: Vembanad, Kannur (North Kerala)

Tamil Nadu: Pichavaram, Muthupet, Thoothukudi, Ramnathapuram, Pulicat, Kazuveli



Importance of Mangroves

Species: Plankton, algae, fish, and shellfish are all fed by the nutrients found in mangrove leaves and roots. Many different species of birds and mammals live in mangroves, including mangrove monkeys in South Asia and Bengal tigers in Sunderbans.

Fishery: Mangroves are essential for fish and shellfish, migratory birds, and sea turtles to nest and breed, which highlights their significance for coastal fishing communities. An article published in the Journal of Sea in 2008 estimates that mangrove forests are directly or indirectly responsible for 80% of the world's fish catch.

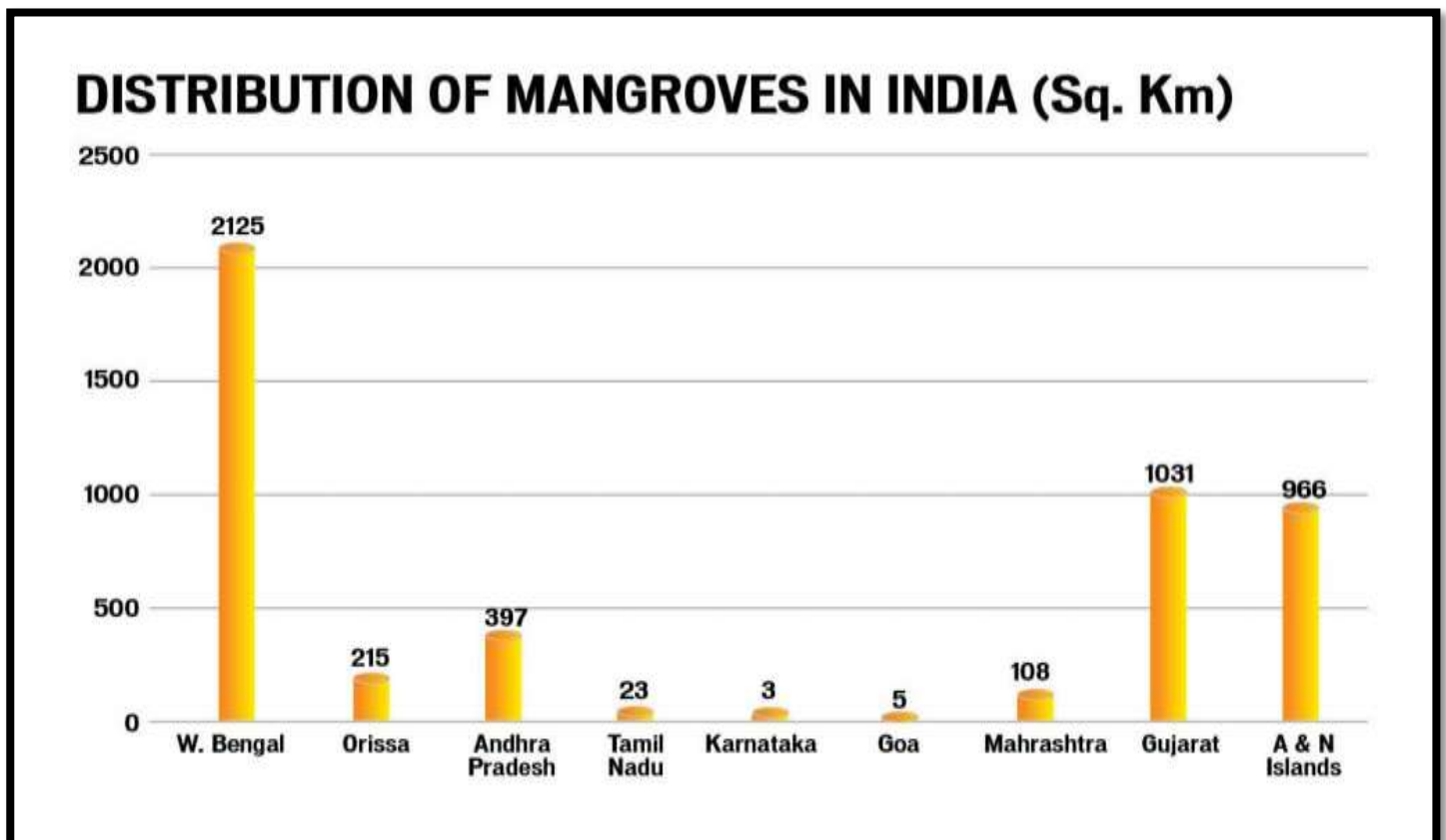
Nutrient Filters: Because of the destruction of mangrove habitats, which typically filter the amount of silt and nutrients that reach the ocean, the amount of sediment and nutrients that reach oceanic waters has increased. That can result in an Algal boom because of excess nutrients discharge.

Climate change: Mangroves are effective carbon sinks. They store three to five times more carbon per unit area than tropical forests and isolate carbon at a pace that is two to four times faster than tropical forests like the Amazon. More greenhouse gases are released when they are cut down compared to other areas of forests.

Stabilization of shorelines: Mangroves create a natural barrier that shields coastal communities from increased storm surges, flooding, and storms also stabilizing shorelines by reducing erosion.

CONCLUSION

Mangroves can absorb wave energy, and because of that they are very important for protecting coastal areas from coastal calamities namely, tsunamis, storm surges, etc. Mangroves can effectively absorb about 70-90 percent of normal wave energy. It is evident that even under extreme circumstances, mangroves' dense root and branch networks could help diffuse tsunamis, and reduce their devastating effects. In December 2004 a massive tsunami hit Asia and causes mass-scale destruction and loss of life. Degradation of the coastal mangrove system makes the coastal areas more prone to tsunamis, and flood-related destructions. It is evident that damage to the property and loss of lives was minimum in coastal regions where there were healthy mangroves.



REFERENCES

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India State of Forest Report 2021