

Mangroves in Mumbai

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Abstract : In this review article, I have focused on history of mangroves in Mumbai, their economical and ecological importance, challenges to mangroves in Mumbai and government efforts to protect mangroves and biodiversity. The Oxford dictionary defines mangroves as tree or shrub which grows in tidal, chiefly tropical, coastal swamps, having numerous tangled roots that grow above ground and form dense thickets. They are among the most productive ecosystem on the earth. Mangroves have important ecological and socio-economic functions. They protect and stabilize the coastline by acting as a barrier against natural disasters, increase soil/ sediment accretion, trap nutrients and heavy metals, provide breeding ground for different types of prawns, shell fishes etc. In the current scenario, conservation of mangroves is not only important for sustainability of the complex ecological niche nurtured by it but also vital for interconnectivity of the marine and land ecosystems. In India, Mumbai is one of the typical examples of mangroves destruction due to urbanization. All the seven islands of Mumbai were reclaimed and linked to a continuous land mass after destroying mangroves in the process. Mangroves protect coastal areas from Erosion, Storm, Surge (especially during hurricanes) and Tsunamis. Due to the uniqueness of mangroves ecosystem and the protection against Erosion that they provide, they are an object in conservation programs including national Biodiversity action plan. The mangroves are the face of Mumbai. We should save mangroves, so that they can save us. Mangroves can be used to save Mumbai and other coastal areas in India from an ecological disaster so that we don't become environmental refugees.

Keywords: Mangroves, ecosystem, Mumbai, coastal area.

I. INTRODUCTION

The Mangrove ecosystem is a peculiar habitat found at the interface between land and sea. The word Mangroves is considered to be a combination of the Portuguese word 'Mangue' and the English word 'grove'. The term "mangrove" is being applied to the specific ecosystem of the intertidal world in the tropics and subtropics and the plant community of this ecosystem is termed as "mangrove vegetation". Many people think that mangroves are a few dwarf weedy plants along the shoreline but mangroves are much more than that. It is a whole ecosystem acting as a buffer between land and sea. Mangroves are extensions of tropical and sub-tropical forests into the sea.

II. EVOLUTION OF MANGROVES

Mangroves are evolved around 114 million years ago. The Indo-Malaysian area is considered as the cradle of evolution of mangrove ecosystem (Krishnamurthy, 1993), because it is widely believed that the mangrove plants developed first in this area and then only spread to other regions of the tropics. This may account for the fact that there are far more mangrove species present in this region than anywhere else. Because of their unique floating propagules and seeds, certain of these early mangrove species spread westward, borne by ocean currents, to India and East Africa, and eastward to the Americas, arriving in Central and South America during the upper Cretaceous period and lower Miocene epoch, between 66 and 23 million years ago. During that time, mangroves spread throughout the Caribbean Sea across an open seaway which once existed where Panama lies today. Later, sea currents may have carried mangrove seeds to the western coast of Africa and as far south as New Zealand. This might explain why the mangroves of West Africa and the Americas contain fewer, but similar colonizing species, whereas those of Asia, India, and East Africa contain a much fuller range of mangrove species. At present the Indo-Pacific region is known for its luxuriant mangroves. Especially the mangrove forests are most luxuriantly present in Southeast Asia. The Sunderbans of India and Bangladesh put together form the single largest block of mangroves of the world. India has a very long coastline with variable ecological features.

III. HISTORY OF MANGROVES IN MUMBAI

Mumbai historical records indicates that there were several islands around Mumbai during 1670. The British who were ruling the country identified the importance of these islands for commercial purpose. They deforested the mangroves and reclaimed these islands into one continuous landmass which later came to be known as 'Greater Bombay'. Since then, the development and increasing population pressure rapidly increased and being the coastal area it took the toll of mangroves land during the process a few mangroves patches are still left in the heart of the city. This proves that today's megacity had a luxuriant past of mangroves forest. Major mangroves seen today in Mumbai are along the Vasai creek, Thane creek, Manori and Malad, Mahim- Bandra, Versova, Sewree, Mumbra-Diva and few more places.

Mumbai has probably lost 40% of all its mangroves in the past decade or so, largely because of reclamation for housing, slums, sewage treatment and garbage dumps. Growing industrial areas along the coastlines and discharge of domestic and industrial sewage are polluting these areas. Fortunately thanks to Godrej family there still exists excellent mangrove forest in Vikroli (link). Around 20 out of the 35 species of true mangroves found in India have been identified along the Maharashtra

coast and 15 species of these are found in Mumbai. Because of the high salinity of the soil something like 60% of Mumbai mangroves comprise *Avicennia marina*. Not surprisingly this species also tolerates pollution including heavy metals such as lead, mercury and chromium all found in significant concentration in the Mithi river.

IV. IMPORTANCE OF MANGROVES FOR MUMBAI

Mangroves represent the spirit of Mumbai – they are plucky survivors. But each day, millions of citizens in Mumbai pass these hardy plants imagining they are little more than dirty, muddy weeds growing pointlessly along the shoreline. But people do not understand that how important mangroves are for the quality of life of the citizens of Mumbai. By trapping silt, mangroves maintain the integrity of Mumbai's shoreline. This is a vital service to the city of Mumbai as it is very prone to erosion, having been built on reclaimed land that is battered by the sea on all three sides.

The ecosystem has a very large unexplored potential for natural products useful for medicinal purpose and also for Salt production, Apiculture, Fuel and Fodder etc.

Mangroves provide livelihood for the fish workers by breeding and nursing the Fish, Prawns, Molluscs and Crabs etc. The Koli community in Mumbai worships mangroves because they know that these are breeding and nursery grounds for the marine organisms on which their sustenance depends.

Costal biodiversity including the million migratory birds that visit Mumbai are housed by mangroves.

Mumbai mangroves can provide a large base for research opportunities for researchers in Botany, Flora and Fauna of Mumbai coastline studies.

V. MANGROVE DESTRUCTION IN MUMBAI

Rapid developments like housing, industrialization, pollution and increasing population of Mumbai has resulted into degradation of mangroves. There are two important creeks, Vasai Creek towards north and Thane Creek toward south where luxuriant mangrove patches are still left. Otherwise the State Govt. agencies have failed to protect this important, productive mangrove ecosystem from building mafias.

In India, a legal protection is afforded to this ecosystem by way of legislation in the form of Coastal Regulation Zone Notification. Recently Mumbai High Court has ordered freeze on destruction of mangrove forests in Maharashtra and has banned construction within 50 metres of them. The court has also directed to notify mangrove areas as protected forests. Thus, there is already a mechanism provided for management of this ecosystem. In such a situation, protection of the mangrove ecosystem is possible only through the participation of the local community and by building up pressure groups for ensuring management of this ecosystem and strict implementation of the legal provisions by the Government. Thereby, integrity of habitats critical for spawning, juveniles and feeding and for biodiversity, apart from ecological sustainability and community-sustainability could be maintained.

In the past few years there has been an increase in the awareness of the people in Mumbai. Residents associations are coming together to spread this awareness. They realize that the rapid destruction of mangroves along the coast of Mumbai will have far-reaching effects on the city. The NGOs in Mumbai are making efforts to highlight the issues like land reclamation, coastal regulation zone notification and illegal destruction of the mangrove areas through the interventions of the local state government and local bodies.

VI. CONCLUSION

Coast of Mumbai suffered considerable loss of the mangroves in last decade. Study reveals that lack of knowledge of the local mangrove species growth condition, soil physiology and microenvironment and lack of manpower are two of the major reasons responsible for the failure of restoration projects. Mangroves have well established reputation due to their ecological significance although their economic exploitation adds more value to their existence and hence provide reason for their protection by local people and government. Role of local communities cannot be neglected in the restoration programs. Knowledge of the mangroves habitat, growth requirement and their uses are key to successful restoration and management project. NGOs can also play a significant role in terms of gathering funds and manpower which are integral components of restoration and management programs. Mangroves can be used to save Mumbai and other coastal areas in India from an ecological disaster so that we don't become environmental refugees.

VII. REFERENCES

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