

Sundarbans are truly ‘sundar’

The Sundarbans is the largest single block of tidal halophytic mangrove forest in the world. It is the estuarine phase of the Ganges as well as Brahmaputra river systems. It lies at the mouth of the Ganges and is spread across areas of Bangladesh and West Bengal, India, forming the seaward fringe of the delta. The typical littoral forests of Sundarbans comprises of a host of trees species adopted to the peculiar estuarine condition of high salinity, lack of soil erosion and daily inundation by high tides.

The tidal forms and the mangrove vegetation in Sundarbans are responsible for dynamic eco-system vigorous nutrient cycling both terrestrial and aquatic. The whole eco-system is sensitive to change in salinity and the continuous cycle of erosion and deposition is affecting the plant continuously adjusting to the new conditions. The great fight goes on between nature and each individual here for survival, and survival for the fittest.

The forest covers of 4,000 sq km are on Indian Side. It has been declared as a UNESCO world heritage site in 1997. The Sundarbans are separately listed in the UNESCO world heritage list as the Sundarbans for India and the Sundarbans National Park, Bangladesh, which is 6000 sq km area. Sundarbans was designated a Ramsar site on May 21, 1992.

“Sundarban” literally means “beautiful jungle” or “beautiful forest” in Bengali . The characteristic trees are the Sundari (*Heritiera littoralis*), from which the name of the tract has been derived. It yields a hard wood, used for building, and for making boats, furniture, etc. Another belief is that it is derived from “Samudraban” or “Chandra-bandhe” which was name of a primitive tribe.

Special Status Since 18th Century

The importance of conserving and preserving Sundarbans was realized way back in late 18th century. This is the first mangrove forest in the world which was brought under scientific management. Under the Forest Act, 1865 (Act VIII of 1865), a large area was declared as reserved forest in 1875-76 and the remaining portions of forests was declared as reserve forest the following year. The control was changed from the civil administration district to the Forest Department. The first management plan was written for

the period 1893-98. The Forest Division was created in 1879 having its headquarters in Khulna.

Conservation History

The Sundarbans Tiger Reserve, created in 1973, was the part of the then 24-Pargans Division. Subsequently the area comprising of the present tiger reserve was constituted as Reserve Forest in 1978. The area of the Reserve is 2585 sq. km. covering land area of 1600 sq. km. and water body over 985 sq. km. Within this area 1330.12 sq. km. is designated as core area, which was subsequently declared as Sundarban National Park in 1984. An area of 124.40 sq. km. within the core area is preserved as primitive zone to act as gene pool.

Within the buffer zone, Sajnekhali Wildlife sanctuary was created in 1976 covering an area of 362.335 sq. km. considering the importance of the biogeographic region of BengalianRiver Forests and its unique biodiversity the National Park area of the Reserve was included in the list of World Heritage Sites in 1985. The whole Sundarbans area was declared as Biosphere Reserve in 1989.

Physiography

To the south the forest meets the Bay of Bengal; to the east it is bordered by theBaleswar River and to the north there is a sharp interface with intensively cultivated land. The total land area today is 4,143 km² and the remaining water area of 1,874 sq km encompasses rivers, small streams and canals. Rivers in the Sundarbans are meeting places of salt water and freshwater. Thus, it is a region of transition between the freshwater of the rivers originating from the Ganges and the saline water of the Bay of Bengal.

Biotic factors here play a significant role in physical coastal evolution. For wildlife, a variety of habitats have developed including beaches, estuaries, permanent and semi-permanent swamps, tidal flats, tidal creeks, coastal dunes, back dunes and levees. The mangrove vegetation itself assists in the formation of new landmass and the intertidal vegetation plays an important role in swamp morphology.

Climate Change Impact

The physical development processes along the coast are influenced by a multitude of factors, comprising wave motions, micro and macro-tidal cycles and long shore currents typical to the coastal tract. The shore currents vary

greatly along with the monsoon. These are also affected by cyclonic action. Erosion and accretion through these forces maintains varying levels whilst the mangrove vegetation itself provides a remarkable stability to the entire system.

During each monsoon season most of the Bengal Delta is submerged. The sediment of the lower delta plain is primarily advected inland by monsoonal coastal setup and cyclonic events. People living in this area may face two of the greatest challenges in coming years- rising salinity and sea levels caused mostly by subsidence in the region and partly by climate change. The Bengal Basin is slowly tilting towards the east due to neo-tectonic movement, forcing greater freshwater input to the Bangladesh Sundarbans. This might increase the salinity of the Indian Sundarbans.

Flora

The Sundarbans flora is characterized by the abundance of *Heritiera fomes*, *Excoecaria agallocha*, *Ceriops decandra* and *Sonneratia apetala*. A total 245 genera and 334 plant species were recorded by Prain in 1903. Unlike most of mangroves in the world the mangroves of Bangladesh are dominated by the *Strobuliaceae* and *Euphorbiaceae*.

Sundari and *Gewa* occur prominently throughout the area with discontinuous distribution of *Dhundul* (*Xylocarpus granatum*) and *Kankra*. Among grasses and Palms, *Poresia coarctata*, *Myriostachya wightiana*, *Imperata cylindrical*, *Phragmites karka*, *Nypafruticans* are well distributed. *Deora* is an indicator species for newly accreted mudbanks and is an important species for wildlife, especially spotted deer (*Axis axis*). Besides the forest, there are extensive areas of brackish and freshwater marshes, intertidal mudflats, sandflats, sand dunes with typical dune vegetation, open grassland on sandy soils and raised areas supporting a variety of terrestrial shrubs and trees.

Fauna

The area is known for the eponymous Royal Bengal Tiger, as well as numerous fauna including species of birds, spotted deer, crocodiles and snakes. Sundarbans Tiger Reserve provides characteristic type of habitat suitable for animals inhabiting vast tidal swamp area. Because of their intimate association with the estuarine environment, sizeable portion of aquatic and semi-aquatic animal communities are interrelated with the animals inhabiting the land areas. The uniqueness of the habitat is said to

have contributed to certain behavioral trends, which are characteristic of Sundarbans tigers only. It is considered that man-eating propensity for tiger in this area is hereditarily acquired over a period of generations in the process of consumption of saline water. Dolphin is the other target specie for planning wildlife management and tourism development.

This unique ecosystem has provided extensive habitats for the River Terrapin (*Betagurbaska*), Indian flap-shelled turtle (*Lissemys punctata*), peacock soft-shelled turtle (*Trionyx hurum*), yellow monitor (*Varanus flavescens*), water monitor- Salvator Lizard (*Varanus salvator*), Indian python (*Python molurus*) and wild pigs. Cheetal, wild boar, rhesus macaque are the main prey species of tiger.

This area serves as the nesting ground for endangered marine turtles like Olive Ridley, Green Turtle and Hawk's Bill Turtles. The aquatic endangered mammals like Gangetic Dolphins thrive within mangrove creeks close to sea. Numbers of heronries are formed here during monsoon as well as during winter. It is home for Trans-Himalayan migratory birds.

The Reserve has received effective protection under Project Tiger since its creation. The core area is free from all human disturbances like fishing, collection of wood, honey and other forest produces while in buffer zone, fishing honey collection and wood cutting are permitted to a limited extent.

Sundarbans mangrove is the home of a number of endangered and globally threatened species. The creeks of Sundarbans form the home of Estuarine Crocodile and Horse Shoe or King Crab. Aquatic animals like the crabs and fishes are also eaten by Sundarban tiger which occupies the pinnacle of both terrestrial as well as aquatic food-web.

Some species such as hog deer, water buffalo, swamp deer, Javan rhinoceros, single horned rhinoceros and mugger crocodile have become extinct since the beginning of last century.

Intensive management takes care of the maintenance and improvement of the habitat through eco-conservation, eco-development, education, training and research. Mud-flats on the periphery of the reserve are artificially regenerated with mangrove plants to meet local fuel wood demand and reduce the pressure on buffer. Non-mangrove plantations are also raised

along roads and embankments of the fringe area to cater the need of the fringe people.

The other main activity is controlling man-eating by tigers which existed here since time immemorial and the number of casualties has been reduced from more than 40 to less than 10 per year. This has become possible due to strict control over the movement of the people inside the tiger reserve, alternative income generation and awareness building among people.

Use of human-masks, electric human dummies etc. are believed to have also contributed in controlling man-eating by tigers. Measures like erection of branches of genwa, nylon net fencing at forest side and solar illumination at village side at night have however, helped to reduce the incidents of tiger straying. For rescuing the strayed tiger, method of tranquilization using dart gun is also applied where driving of the tiger to the nearby forest is not possible.

The Reserve has successfully launched a special programme to conserve the highly endangered Olive Ridley Turtles. Hatching of Olive Ridley Turtles and River Terrapin is done at Sajnekhali to replenish their population (India Current Affairs 18-2-12).