



## Biodiversity of Coringa Confluence

Bhautik D. Savaliya<sup>1</sup>, Sheetal K. Bharda<sup>1</sup>, Vikas Kumar Ujjania<sup>1</sup>, Tandel Rutvikkumar<sup>2</sup> and Pragati Kumari<sup>3\*</sup>

<sup>1</sup>ICAR-Central Institute of Fisheries Education, Mumbai, Maharashtra (400 061), India

<sup>2</sup>Dept. of Fisheries Resource Management, College of Fisheries Science, Kamdhenu University, Veraval, Gujarat (382 010), India

<sup>3</sup>Dept. of Fisheries Hydrography, College of Fisheries (DBSKKV), Shirgaon, Ratnagiri, Maharashtra (415 629), India



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### Corresponding Author

Pragati Kumari

✉: pragatik46264@gmail.com

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### Abstract

The mangrove is one of the most productive ecosystems in the world due to the fact that it collects nutrients from both the land and the tides. Mangroves are found in the Andaman and Nicobar Islands and the east and west coasts of India. In the mainland, the mangroves are more developed in the east coast than in the west. The Coringa mangrove is located south of the Kakinada Bay and approximately 150 km south of Visakhapatnam. Next to Sunderbans, it is the second largest mangrove formation in India. Additionally, Coringa mangroves are an excellent source of carbon sinks and sequester a significant quantity of CO<sub>2</sub> emissions. Approximately 120 resident and migratory bird species use the Coringa Wildlife Sanctuary for breeding and nesting. Construction, overexploitation, industrialization, oil pollution and spills, poaching, agricultural pesticides, and municipal anthropogenic are threats Coringa mangrove habitats. This article covers Coringa mangrove biodiversity and conservation strategies.

**Keywords:** Biodiversity, Conservation, Coringa, Mangrove

### Introduction

The Godavari is the second largest river in India, and forms a mighty basin, which supports unique landscapes and biodiversity in both the Western and Eastern Ghats. The river has two major distributaries, the Vasishta-Godavari and Gautami-Godavari, and flows 1,465 km to the Bay of Bengal. It is the confluence of the Gautami-Godavari River with the Bay of Bengal that gives rise to an extensive river estuarine ecosystem known as the Godavari mangroves. Coringa is named after the river Corangi. Coringa mangroves receive freshwater from Coringa and Gaderu rivers, distributaries of Gautami Godavari River and neritic waters from Kakinada Bay. There are three marine protected areas (MPA) in Andhra Pradesh, of the total 31 MPA's in the country. Coringa mangroves of Godavari delta is the first designated MPA in Andhra Pradesh in 1978, followed by Pulicat in 1980 and Krishna delta in 1999 (Rajagopalan, 2008). All these three MPA's of Andhra Pradesh are later re-designated as Wildlife Sanctuary (WLS) under the Wildlife Protection Act 1972.

Coringa mangrove (Lat. 16°44' to 16°53' N and Long. 82°14' to 82°22' E) is situated south of Kakinada Bay and is about 150 km south of Visakhapatnam. The Northern part of the

sanctuary is covered by the backwaters of the Kakinada Bay. The Kakinada spit present on the eastern side of the bay running north to south in direction acts as an artificial embankment. Its shoreline habitats include mangrove swamps, tidal flats, channels and shallow bar-built bay towards north. The eastern side is bounded by the Bay of Bengal. Rehabilitating the saltwater crocodile which was at the edge of extinction and to protect the other endangered species, such as olive ridley turtles and Indian otter, the Government of Andhra Pradesh declared a part of Godavari mangrove system as Coringa Wild Life Sanctuary in July, 1978. Coringa Wildlife Sanctuary and its adjoining mangrove landscape, plays a crucial role in regional economic and livelihood development besides providing various ecosystem services essential as life supporting systems for the East Godavari region. Unfortunately, this ecosystem is getting whittled away due to high degree of anthropogenic pressures and needs to be addressed immediately through conservation and restorative processes (ICMAM, 2001).

### Significance of Coringa Mangrove

Coringa is the second largest mangrove formation in India, next to Sundarbans. The ecosystem service provided

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by mangroves of East Godavari coastal region Coringa mangroves are bordered on the northern side by Kakinada Bay. It is home to as many as 35 species of mangroves, of which 16 are true mangroves, the rest being associated species. The dominant genera are *Avicennia*, *Excoecaria*, *Aegiceras*, *Rhizophora* and *Sonneratia* (Anonymous, 2017).

#### a) Provisioning Services

**1. Food:** Mangroves here are permanent or temporary habitats for many aquatic animals such as finfish, shellfish, crustaceans and are hatching and nursery grounds for many marine fish. It is estimated that up to 80% of regional fish catches are directly or indirectly dependent on mangroves.

**2. Timber and fuel wood:** The villagers of this region mostly use the timber of mangrove flora to build houses and make furniture, rafters, fences, bridges, poles, boats and as fuel wood.

**3. Medicines:** There were a few traditional uses for mangroves and associates like *Caesalpinia bonduc*, *Clerodendron inerme*, *Derris trifoliolate* and *Hibiscus tiliaceus*. The bark of *Ceriops decandra* is prepared traditionally *Dalbergia spinosa* to enhance the durability of the fishing nets. The barks of many species produce gums and tannins, which are still used for curing leather and strengthening fish nets.

**4. Other non-timber forest products:** The breathing roots of *Sonneratia* species are used to make corks and fish floats. Mangrove plants are sources of sodium and the ash of some species, such as *Avicennia*, is used as soap.

**5. Enrichment of coastal sea:** The coastal vegetation like algae, seaweeds and mangroves play a significant role in enriching the coastal sea. They transport the dissolved organic matter, nutrients etc., besides serving as a nursery area for the larvae and juvenile marine animals and thus support the benthic population of the sea.

**6. Spawning ground for commercially valued finfish and shellfish:** These forests are the home ground for a variety of commercially important fish, prawns, crabs and other species in their early stages, thus providing a big economic source to the country in general and state in particular.

#### b) Relating Services

**1. Protecting the shoreline:** Mangroves in this region act as physical buffers between the elements and the shore and can absorb 70-90% of the energy of the waves, depending on their ecological condition. The mangroves of coringa serve as a big barrier, safeguarding the Kakinada town.

**2. Carbon sequestration:** Mangroves are important carbon sinks. They sequester about millions of tonnes of carbon year<sup>-1</sup>. A 20-year-old plantation of mangroves has a carbon burial rate of 580 g m<sup>-2</sup> year<sup>-1</sup>.

**3. Promoting accretion:** Mangroves function much like a living grove to build up sediment, stabilizing the ground and fixing mud banks. It is estimated that there is an annual sedimentation rate ranging between 1 to 8 mm in mangrove areas that are expanding in land area. Therefore, they prevent erosion.

**4. Flood attenuation:** Mangrove habitats function as gigantic sponges to trap and slowly release surface water. A one-acre wetland can typically store about three acre-feet of water.

**5. Trapping pollutants:** Mangrove roots that help trap sediments also function as filters to sift out pollutants reaching the sea from inland waters.

**6. Support for fauna:** The canopy of mangrove trees provides an essential terrestrial habitat for fauna which prefer arboreal life. Mangrove soils are soft; mud mixed with sand and contains fauna which is not found in sandy and rocky shores. These forests are the habitat of species like fishing cats, otters, wolves and rhesus monkeys etc. Apart from these residential species a number of birds are attached to these forests since they provide food for them in the form of fish, crabs, microorganisms and mudskippers etc. (Figure 1).



Figure 1: Biodiversity of Coringa Sanctuary (Kashi, 2022)

#### Protection of Turtle Nests

The lifespan of sea turtles has been speculated at 80 years. It takes decades for sea turtles to reach sexual maturity. After mating at sea, adult female sea turtles return to land to nest at night. Generally, females return to the same beach where they were hatched. This can take place every 2-4 years in maturity. The mature nesting female hauls herself onto the beach and finds suitable sand on which to create a nest. Using her hind flippers, she digs a circular hole 40-50 cm deep. After the hole is dug, the female then starts filling the nest with a clutch of soft-shelled eggs one by one until she has deposited around 50-200 eggs, depending on the species. Some species have been reported to lay 250 eggs, such as the hawksbill. After laying, she refills the nest with sand, re-sculpting and smoothing the surface until it is relatively undetectable visually. The whole process takes 30-60 minutes. She then returns to the ocean, leaving the eggs untended. Incubation takes about 2 months. The eggs in one nest hatch together over a very short period of time. When ready, hatchlings tear their shells apart with their snout and dig through the sand. Every year olive ridley sea turtles visit the coastal districts and lay eggs during the month of December to March and proceeds up to June of the succeeding year.

#### Otter/ Fishing Cat Habitat Conservation and Monitoring

##### Otters in India

Smooth otters are named for their shorter, smoother coats, as compared to the similar-sized sympatric *Lutrogale* species.

This species occurs in a variety of habitats from mangroves of freshwater wetlands. Among all Asian otters this is the one, occurs to be most common through most of its ranges. It is found throughout India in the states of Kerala, Andhra Pradesh, Mizoram, West Bengal, Gujarat, Himachal Pradesh and Maharashtra. In most of these states, the otter population has declined in areas in which they were once quite common.

### Legal Status

Indian smooth-coated otters are the semi-aquatic members of the family Mustelidae and are the most common of Asian otters. These otters are the indicators of healthy aquatic environments. Indian smooth-coated otters are included in Schedule II (Part II) of the Indian Wildlife (Protection) Act of 1972 and covered under Part A of Schedule I of the Export (Trade) Control Order, 1988.

### Threats Identified in and around Coringa Wildlife Sanctuary

The greatest threats to the otters in and around Coringa Wildlife Sanctuary are due to loss of habitat particularly wetlands conversion into aquaculture ponds and agricultural purposes. Over exploitation of fish fauna is also a major cause of declines in the population of otters. Pollution of waterways with industrial, agricultural pesticides and municipal wastes threatens and contaminates the food chain on which otters depend and high level of human disturbance. Otters are caught and drowned in fishing nets, not fitted with otter guards. Other significant threats to otters in the form of oil pollution, oil spills, poaching and conflicts with fisheries.

### Water Bird Monitoring and Habitat Improvement Measures

The Coringa mangrove forest attracts many migratory bird species. They include seagull, flamingo, pond heron, grey heron, sandpiper, little egret, red-wattled lapwing, blue kingfisher, pied kingfisher, brahminy kite, little cormorant, reef heron, crow pheasant and black-capped kingfisher bird species. For the first time in the state of Andhra Pradesh, three rare migratory bird species have been spotted the broad-billed sandpiper, crab-plover and greater flamingo in the Coringa mangrove forest in east Godavari district. The bird population in Coringa Wildlife Sanctuary this year has gone up by 12,000, compared to last year's census, which enumerated 34,207 migratory birds belonging to 104 species. In 2020, 26,734 birds belonging to 96 species were enumerated. After five years, the bird population in the Coringa Wildlife Sanctuary crossed the 40,000 marks (New Indian Express, 2022).

### Conservation Strategies

For the purpose of conserving, improving and developing the existing mangroves the following conservation strategies are adopted. Bring mangroves under the network of protected areas. Mangroves and mangrove sanctuaries, especially core regions, need to be demarcated to prevent invasion. Increasing the amount of time spent on watch and ward to increase security. Digging canals 12.5 m apart to begin massive afforestation of empty land. The seedlings are 60 cm

tall. The seedlings grown in the nursery are planted on sloped edges of the channels at 2.0 m apart staggered through the funds from the World Bank Assistance and the Ministry of Environment and Forests, Government of India. Forming Eco-Development Committees to conserve mangroves through a participatory approach by giving welfare measures/alternatives to the communities living near the sanctuary to minimise their dependent on the mangroves and improve their livelihood. Establishing a Nature Study Center to educate people about the importance of protecting fragile ecosystems and the roles they play in the natural environment.

### Conclusion

Coringa Wildlife Sanctuary is located in this area and it supports a wide range of flora and fauna. Salt and fresh water are mixed to create regular tides that bring plenty of nutrients to the Coringa mangrove environment. Coringa is an estuary; hence it has a higher biodiversity of organisms. The mangroves outside of the Coringa marine protected areas were diminished mostly as a result of coastal erosion and anthropogenic interferences, such as the conversion of mangroves to aquaculture and other land uses. Mangroves necessitate the formulation of a comprehensive coastal zone management plan that addresses a variety of challenges. In order to have developmental activities that are managed, rules and regulations need to be drafted and then enforced.

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