# Wetlands

# Facts & Factors



Odisha, a state located on the eastern coast of India, boasts of a rich diversity of wetlands, each with its unique set of flora and fauna. These wetlands not only serve as habitats for countless species of birds and animals, but they also play a vital role in regulating the local climate, water quality, and fishing industry. From the lush mangroves of Bhitarkanika to the tranquil Chilika Lake, Odisha's wetlands are truly treasures to be cherished and protected.

# Anshupa Lake

This *inland lake* is declared as an important wetland site and has tourists' attraction.

#### Location

North of *Mahanadi* delta and has association with two other lakes namely, *Kantapanhara* and *Ostia*.



Anshupa Lake, Credit: Lalatendu Bhoi

## Dimensions

230 hectares in area, morphometrically 3 km in length and width varying between 250-500 m.

# Average Depth 28

The average depth is supposed to be about  $12 \, \mathrm{m}$ , which due to *siltation* has reduced to about  $3 \, \mathrm{m}$  now.



Anshupa Lake, Credit: Lalatendu Bhoi

Water spread extent would gradually reduce by pre-monsoon and the vegetation would be pronouncedly observed on the imagery. The adjacent lakes nearly dry out during pre-monsoon. The combination of indices (MNDWI NDPI NDVI) aids in delineation of open water and vegetation specific to wetland.



# Anshupa Lake

#### Flora

Includes 47 species.

The *fringes* are occupied by *Polygonum glabrum*, *P. barbatum*, *Limnophila heterophylla*, *Cyperus plalystylis*, *Aeschynomene aspera*.

Hydrilla verticellata, Ceratophyllum demersum, Myriophyllum tetrandrus are seen where shallow water is present.



Eichhornia crassipes, Source: wikipedia

Free floating species like **Nymphoides, Trapa natans, Eichhornia crassipes** and rooted floating ones like **Euryale ferox, Nymphaea aquatica, Trapa natans Var. bisporosa** are seen at a depth of 2-3 m.

The *emergent* species like *Sacciolepis interrupta*, *Eichhornia stagnina* are observed in the lake.



Porphyrio porphyrio, Source: wikidata

#### Fauna

Pila globosa, Belllama bengalensis, Lymnaea accuminata are seen abundantly.

20 species of avifauna are observed in the lake, of which the dominant ones are Porphyrio porphyrio, Metopidius indicus, Halcyon smymensis, Egretta garretta etc.

## Fishes

15 species of fishes are known to exist in the lake of which Nandus nandus, Clarias baraches, Heteropneustes fossilis, Barbus chola and B. ticto are dominant.



Nandus nandus, Source: Aquainfo



# Satkoshia Gorge Sanctuary The same of the sa





#### Location

A stretch of 22 km of *Mahanadi* River in the *Satkoshia* Gorge between Tikarpara and Baramul has been declared as sanctuary in 1976 to protect and conserve the critically endangered Gharial (Gavialis gangeticus). It is located in Angul District, Odisha.

## Dimensions

The area of the sanctuary is estimated to be 79,552 hectares.

## Flow of River

The river is very slow-flowing for much part of the year as evident from the satellite data of both post-monsoon as well as pre-monsoon.

Several sand bars and gravel beds are exposed at low water levels, which form sites for the Gharial.



Satkosia Gorge, Credit: Indu (Pantiss)



Hygrophila auriculata, Source: wikipedia

#### Flora

The wetlands of Satkoshia Gorge Sanctuary are dominated by a variety of aquatic plant species, including Water Lilies (Nymphaea alba), Water Hyacinth (Eichhornia crassipes) and Indian Swamp Deer grass (Hygrophila auriculata).

These plants play an important role in the ecosystem by providing *food* and habitat for aquatic animals, as well as stabilizing the water column and reducing erosion.

## Fauna

The Satkoshia Gorge Sanctuary is recognized for its rich biodiversity, with over 140 species of birds, 31 species of mammals, and numerous species of reptiles and fish being recorded.

Some of the notable species found in the area include the Indian Elephant (Elephas maximus), the critically endangered Gharial (Gavialis gangeticus), and the Slender Loris (Loris tardigradus).



# Satkoshia

The sanctuary is also home to several species of migratory birds, such as the Painted Stork (Mycteria leucocephala), the Spot-billed Pelican (Pelecanus philippensis), and the Lesser Adjutant (Leptoptilos javanicus).



Gharial (Gavialis gangeticus), Source: EDGE of existence

#### Fishes

The wetlands of *Satkoshia* are home to a rich diversity of fish species. Some of the notable fish species found in the area include *Mahseer (Tor tor)*, *Catfish (Mystus vittatus)*, *Channa (Channa striata)*, *Eel (Anguilla bicolor)* and *Climbing Perch (Anabas testudineus)*.

## The Gharial Project

Sand bars and gravel beds are exposed at low water levels form sites for the Gharial hatchling. The *last wild hatchlings* were observed in 1974.

To restore the population, *captive-reared individuals* are being released to augment the vestigial population. About 107 were reported to have been released during 1977 to 1980.

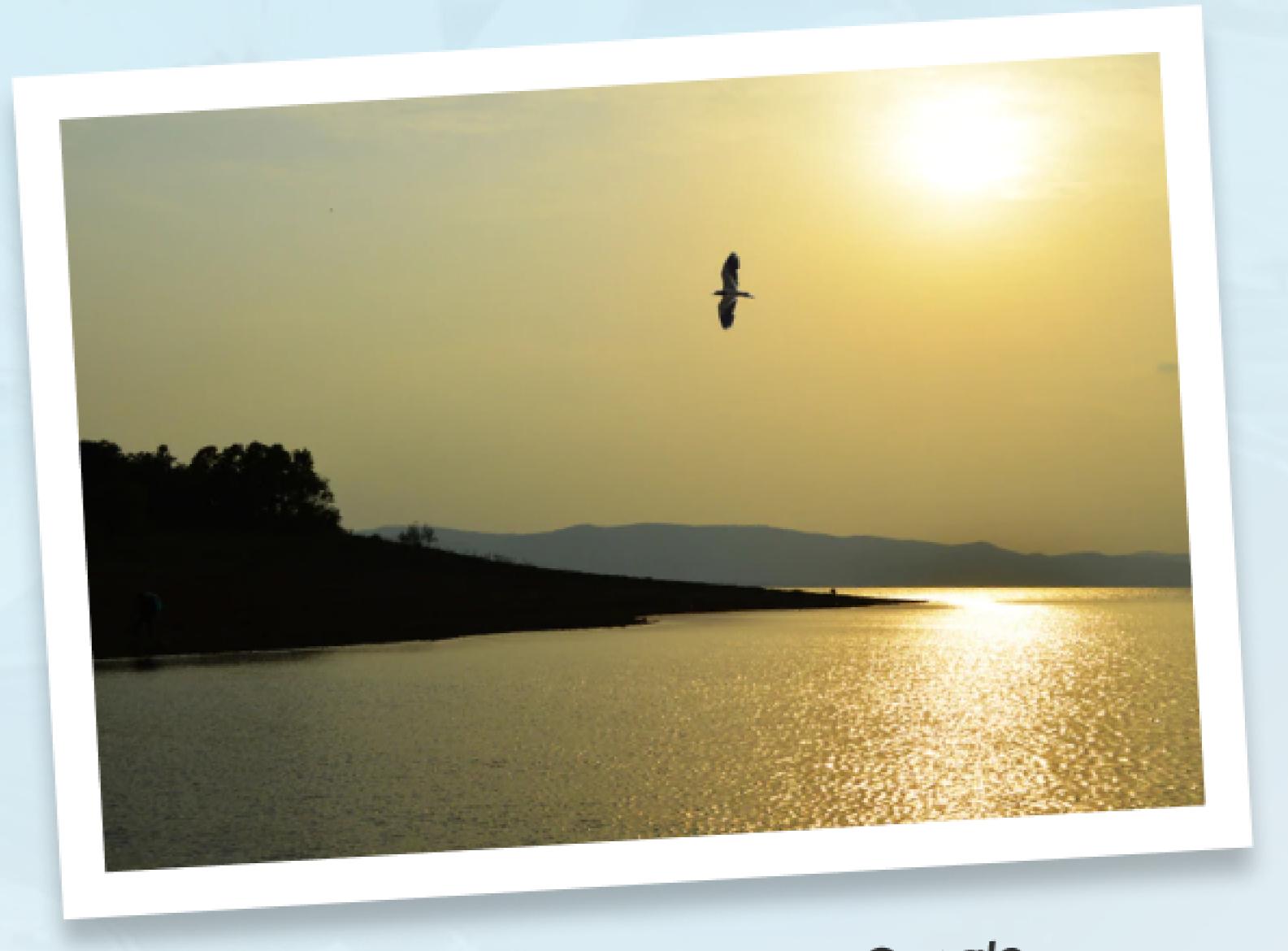
There has been a considerable amount of *research* centered around the *Gharial project*.

# Hirakud Reservoir

The Hirakud Reservoir is a major source of water, irrigation, and hydropower in the state of Odisha, India. It was created as a result of the construction of the Hirakud Dam, which was completed in 1957.

## Dimensions

One of the largest artificial lakes in Asia, Hirakud Reservoir covers an area of approximately 630 square kilometers. The length of the dam, which was built across the Mahanadi River, is around 25 miles (40 km), and the reservoir stretches up to 70 miles (112 km) upstream from the dam.



Hirakud Reservoir, Source: Google





# Average Depth

The average depth of the reservoir is around 114 feet (35 meters), and its maximum depth is around 205 feet (62 meters).

#### Flora & Fauna

The *Hirakud Reservoir* in India is home to a rich and diverse array of flora and fauna species. The reservoir serves as a crucial habitat for many aquatic and terrestrial species, and plays an important role in the region's ecosystem.

**Phytoplanktons** present in the reservoir include **39 recorded species** and **zooplankton** consists of **10 species** belonging to *Rotifera, Cladocera, Copepoda*.

There are also a variety of aquatic plants present in Hirakud such as Water Lilies (Nymphaea sp.), Lotus (Nelumbo nucifera), and Reeds (Phragmites sp.). These plants provide essential habitat for aquatic animals and also play an important role in water purification by absorbing excess nutrients and pollutants.



Golden Mahseer, Source: Wikipedia

Fauna species found in the Hirakud Reservoir include a variety of fish species, such as Catfish (Siluridae sp.) and Mahseer (Tor tor), as well as numerous birds such as Cormorants (Phalacrocoracidae sp.), Egrets (Ardeidae sp.), and Kingfishers (Alcedinidae sp.). These birds play an important role in controlling the populations of insects and other small animals found in the reservoir.



Cormorant (Phalacrocoracidae sp.), Source: Wikidata

In addition to fish and birds, the Hirakud Reservoir is also home to a variety of reptiles, including Snakes (Serpentes sp.) and Turtles (Testudines sp.), and various mammals, such as Otters (Lutrinae sp.) and Wild Boars (Sus scrofa). These animals play important roles in the ecosystem, serving as predators and prey for other species.

# • Chilika Lagoon





#### Location

Chilika lagoon is situated in Puri and Ganjam districts of Odisha on east coast. It is the largest brackish-water lagoon in India and perhaps the second largest in the world. It was declared as a sanctuary in 1973 and later designated as Wetland of International Importance under Ramsar Convention in 1981. The lake is connected to the Bay of Bengal by channel through a sand ridge in the north-east.

#### Climate

The lagoon experiences a typical tropical monsoon climate with temperatures ranging from 17.5°C to 32.5°C.

# Salinity & pH of Water

The variation in salinity between 0.1 to 36 %. The pH varies between 6.8 to 9.7.



Chilika Lagoon, Credit: Satya Suman Rout

#### Dimensions

The Chilika Lagoon is approximately 111 kilometers in length, Width varies from 11 to 50 kilometers. It has a massive surface area of approximately 1,100 square kilometers. Maximum depth of Chilika is approximately 2.5 meters.

Bhargavi and Daya rivers in the north are the main, besides other eight rivers that bring in an estimated 375,000 cusecs of monsoon fresh water into the lagoon. The annual sediment loads due this inflow water is estimated to be about 13 Mmt.



Phragmites sp., Source: Wikipedia

#### Flora

22 species of algae, 150 species of vascular plants are recorded in the lagoon.

The dominant emergent plants are *Pragmites karka, Typha angustata, Cyperus sp.* and *Kailinga triceps.* 

Submerged vegetation is dominated by Enteromorpha sp., Gracillaria sp., Cladophora sp., Polysiphonia sp., Najas sp., Chara sp., Hydrilla sp. and Potomageton sp.



#### Fauna

It has **267 species** of *fishes*, **35 species** of *crabs* and **29 species** of *shrimp* and *prawns*. Nearly **225** *bird species* in the *peak winter season*.

The lagoon hosts 1 million+ migratory birds with flocks of Ducks (Anatinae), Geese (Anserinae), Flamingos (Phoenicopterus sp.), Pelican (Pelecanus sp.), Plover (Charadrius sp.), Gulls (Larus sp.) and Terns (Sterna sp.).

It is home to **7 species** of *amphibians* mainly *frogs* and *toads*.

It also forms a habitat to 24 species of reptiles comprising soft-shelled turtles, lizards, snakes.

It shelters the largest population (only 158) of *endangered Irrawaddy dolphin*.



Irrawaddy dolphin, Source: WWF

#### Threats

Sediment load, proliferation of emergent vegetation, pollution from domestic and industrial waste.

# Bhitarkanika Mangrove

Bhitarkanika represents one of the finest patches of mangrove forest along the entire coast of India after Sunderabans and Andaman and Nicobar Islands.

It was declared as Wildlife Sanctuary in 1975 initially to protect saltwater crocodile and later as National Park in 1998.



Bhitarkanika Mangroves, Credit: Lala Niranjana Prasad Ray

Garhimata coast or eastern boundary of the sanctuary to protect

Olive Ridley sea turtles as Garhimata

Marine Sanctuary in 1997.

The whole area has been accorded International Importance by its designation as a Ramsar Site in 2002



# Bhitarkanika

#### Flora

Compared to Sundarbans, India's largest tract of mangrove forest, Bhitarkanika represents an wider species diversity of mangrove flora, which comprise 55 species out of recorded 58 species in India.

The Heritiera formation of Champion and Seth (Type 4B/TS-4, 1968) comprising brackish water association



Olive Ridley, Source: Hindustan Times

of *Heritiera, Cynometra, Aglaia, Cerbera* and *Intsia* are well represented in Bhitarkanika.

Dominant mangrove species are Aegiceras corniculatum, Avicennia officinalis, Cerebra manghas, Excoecaria agallocha, Heritiera fomes, H. littoralis, Kandelia kandel Merope angulata, Rhizophora apiculata, R. mucronata, Sonneratia apetala, Xylocarpus granatum, X. mekongenesis and X. moulcensis.

#### Fauna

Bhitarkanika harbours *one of the largest populations* (about 700) of *endangered* saltwater crocodile (*Crocodylus porosus*) in India.

Eastern boundary of Bhitarkanika (Garhimata) supports nearly half million olive ridleys that nest every year is the single largest nesting ground in the world.

The Water monitor (Varanus salvator) is common here otherwise rare in most part of India. Two other monitors common here are V. bengalensis and V. flavescens.

Notable among other *reptiles* are *Ophiophagus hannah*, *Python molurus* bivittatus, Bungarus fasciatus, B. caeruleus and Chryopelia ornata.

Extremely high congregations of **migratory waterfowl** are observed during December and January of which **11 species** from *Ciconiformes* are known to nest in the multispecies nesting colony.

5 species of marine dolphins have been recorded from the area namely Sousa chinesis, Orcaella brevirostris, Delphinus delphis and Pantropical spotted dolphin.

# Kanjia Wetland

#### Location

It is located inside the zoological and botanical park *Nandankanan* tiger reserve. The wetland opens into **flat deltaic plain of Prachi River** which existed in the past.

# Depth

The *depth* of Kanjia wetland varies between 2.5 to 4 m.







Kanjia Wetland, Source: pinterest

#### Flora

The deep-water habitat harbours few species like Ceratophyllum demersum, Hydrilla verticellata, Najas foveolata and Potomageton pectinatus.

While medium depth habitat records the presence of Vallisneria natans, Aponogeton natans, Ottelia alismoides, Nymphoides hydrophylla, N. inida, Nymphae stellata, N. nouchali, Nelumbo nucifera, Trapa natans.

The free-floating species are *Salvinea cucullata*, *Pistia stratiotes*, *Echhornia crasspes*.

The emergent plants that are seen in shallow water are Scirpus articulata, S. grossus, Typha angustata, Cyperus plastyllis, Panium repens.

The rooted submerged plants include **Utricularia inflexa**, **Myriophyllum tetradrum**, **Limnophylia indica**.

The shoreline is dominated by *Hygroryza aristata*. Marshland around the wetland has the presence of *Ludurigia adscendens*, *Adenostemma lavenia*, *Sesbania javanica*, *Typhya angustata*, *Aeschynomene aspera*.



Salvinia cucullata, Source: Kew.org

#### Fauna

Fauna includes 40 species of riverine fish, 12 species of frog and 21 species of birds.

#### Threats

Salvinia cucullata covers the entire wetland within very short time during the post-monsoon, which warrants regular de-weeding.







Youth4Water PLUS is an exciting and ambitious UNICEF-led Campaign, which has led to an outreach to over 435000 youths with awareness and action programme around water, sanitation and hygiene (WASH) & climate change.

500000+ youths are connected through social media to amplify the voices of youth.



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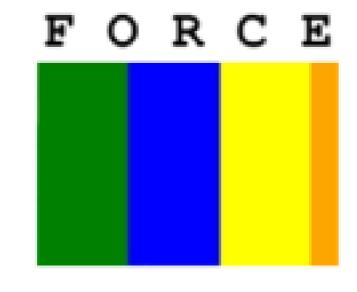














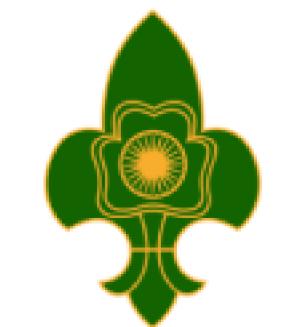








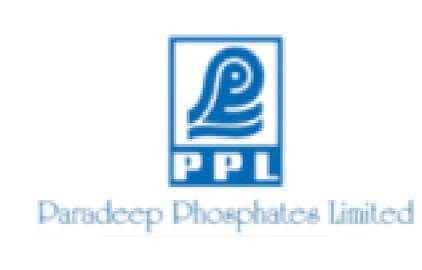












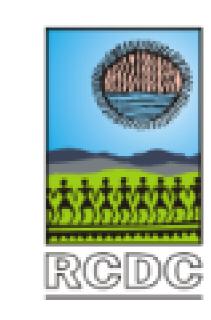










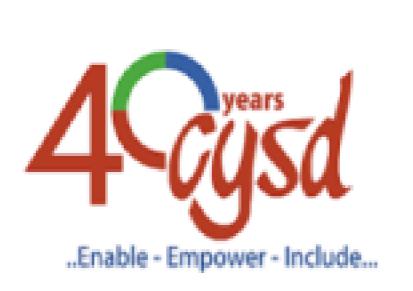












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