

Wetlands

Wetlands are areas where water covers the soil, or is present either at or near the surface of the soil all year or for varying periods of time during the year, including during the growing season. Wetlands may support both aquatic and terrestrial species. The prolonged presence of water creates conditions that favor the growth of specially adapted plants (hydrophytes) and promote the development of characteristic wetland (hydric) soils.

Importance of wetlands

- **Products and services:** Wetlands have unique ecological features which provide various products and services to humankind. The wetlands provide ecosystem goods such as - water for irrigation, fisheries, non-timber forest products, water supply, recreation etc. Some major services include carbon sequestration, flood control, toxics retention, nutrient removal, groundwater recharge, and biodiversity maintenance.
- **Agriculture and fishery sector:** Wetlands such as tanks, ponds, lakes, and reservoirs have long been providing multiple-use water services which include water for irrigation, domestic needs, ground-water recharge, etc. In terms of growth in fish production in India, wetlands play a significant role. About 61% of fish production in the country is from inland water bodies and it is also the second largest aquaculture farmed fish producer in the world.
- **Carbon sequestration:** Swamps, mangroves, peat lands and marshes play an important role in carbon cycle. Wetland soils contain about 200 times more carbon than its vegetation. In India, coastal wetlands ecosystems including mangroves cover around 43000 km and playing a key role in carbon sequestration. Mangroves are able to sequester about 1.5 metric tons of carbon per hectare per year.
- **Pollution abatement:** Wetlands act as a sink for contaminants in many agricultural and urban landscapes. In India, wetlands are polluted through agricultural runoff and discharge of untreated sewage and other waste from urban areas.
- **Flood control:** Wetlands play an important role in flood control. Wetlands help to decrease the impacts of flooding by absorbing water and reducing the speed at which flood water flows. For example, a large network of lakes and ponds in major cities like Srinagar, Bhopal, Bangalore, Chennai and Hyderabad were constructed with the objective of flood control. Besides, the mangroves along the sea shores, especially on the western coast in West Bengal and Odisha have been playing a major role in protecting the coastal environment from the destruction of cyclones that frequently emanate in the Bay of Bengal.
- **Biodiversity hotspots:** Wetlands are very important to support species diversity. Because wetlands provide an environment where photosynthesis and recycling of nutrients can take place. They also play a significant role in the support of food chains. In India, freshwater bodies such as lakes, rivers and others support a large diversity of biota (almost all taxonomic groups). For example, freshwater ecosystems of Western Ghats alone have 290 species of fish. Similarly, Loktak lake is famous for being the only refuge of the endangered Sangai (Manipur brow-antlered deer). Wetlands are also important breeding sites for **domestic and migrating bird species**. In many such wetland areas of

India, like Bharatpur wild life sanctuary in Rajasthan, and little Rann of Kutch and coastal areas of Saurashtra in Gujarat, many migratory species of birds, including **siberian crane**, from western and European countries come during winter. Sarus cranes, black necked cranes, Gangetic river dolphins, the Indian mud turtle and numerous threatened species of birds and fauna are live in and around wetlands. Moreover, the approximate number of species of migratory birds recorded from India is between 1200 and 1300, which is about 24% of India's total bird species.

- **Tourism:** Wet-lands such as coral reefs, beaches, reservoirs, lakes and rivers are considered to be a significant part of the tourism experience in the country. Every year, around 7.0 million tourists visit Kerala's backwaters, beaches and wildlife sanctuaries, 3 million visit Uttarakhand's lakes and other natural wetlands and one million visits Dal lake in Jammu and Kashmir.
- **Cultural significance:** Wetlands especially lakes and ponds (e.g. Pushkar lake in Rajasthan and Ramappa lake in Telangana) are intrinsically linked to the local culture. They are revered by the masses in recognition of the fact that they are the means of sustenance of their livelihood.

The threats to wetlands

The major threats to wetlands are the urbanization and anthropogenic activities; land based industrialization, community demands for food, fodder and fuel. The other threats include dumping of tile factory wastes, coconut husk curing, sand and shell removal, weed choking, waste disposal by intensive aquaculture and its wastes, industries and agricultural practices along the catchment area. Some of the major threats are discussed below.

- **Urbanization and land use changes:** The urbanization has been increasing rapidly in recent time. This level of growth resulted into tremendous pressure on wetlands and flood plain areas for meeting water and food demand of growing population. For example, the Kanwar lake in Bihar, Asia's largest freshwater oxbow lake, has shrunk to one-third of its size due to encroachment, much like Jammu and Kashmir's Dal lake. And, about 34000 hectares of the water spread area of the Kolleru lake in Andhra Pradesh have been reclaimed for agriculture in recent years.

- **Agricultural residues:** To feed the ever growing population, farmers are using chemical fertilizers, insecticides to produce high yield of crops. As a result, the chemical remains for long time in soil and run off with rain water to wetlands that leading to eutrophication (excess algal growth).

- **Municipal and Industrial pollution:** Less than 31 percent of the domestic wastewater from Indian urban centres is treated, compared to 80 percent in the developed world, which is largely discharged in the natural water bodies such as streams and rivers. For example, **River Yamuna**, which passes through 6 Indian States, receives about 1789 MLD of untreated waste water from the capital city of Delhi alone. This is about 78 percent of the total pollution load that flows in to the river every day. Similarly, untreated industrial effluents have become a major threat to the survival of wetlands. For

instance, **the Bellandur Lake in Bengaluru city** was ‘on fire’ in May 2015 due to the discharge of effluents (especially nutrient rich foams) by the surrounding industries.

• **Climate Change:** In 2007, the UNESCO estimated that Global climate change is expected to become an important driver of loss and change in wet-land ecosystem. These findings are important for India which has been experiencing the flood-drought-flood cycle for the last 2 decades. As per a study, wetlands located in high altitude as well as coastal areas, like mangroves and coral reefs, are some of the most sensitive classes that will be affected by climate change. For example, climate change caused rise in level of Tsomoriri Lake in Ladakh, a glacial fed high altitude lake, thereby causing submerged important breeding islands in the lake where endangered migratory birds like the Black-necked Crane and Bar-headed Goose would breed. As per an estimate, **India will lose about 84 percent of coastal wetlands and 13 percent of saline wetlands** with climate change induced **sea water rise of 1 metre**. Apart from the above major threats, immersion of idols and religious ritual waste, introduction of exotic species, encroachments and unregulated aquaculture (e.g. Kolleru lake) backed by **Bureaucrats-Politicians-Businessmen nexus**, dredging, un planned urbanization and development projects are some of the other dangers threatening the existence of wetlands across the country.

Management strategies:

- 1) **Ramsar Convention:** The convention is named after Ramsar in Iran in which the convention was ratified in 1971. The convention is aimed at augmenting national action and international cooperation for the conservation and wise use of wetlands and their resources.
- 2) **National Wetland Conservation Programme (NWCP):** It was launched in 1985 to enable conservation and wise use of wetlands in the country so as to prevent their further degradation.
- 3) **The Central Wetlands (Conservation and Management) Rules:** They were notified for the first time in 2010 for better management and regulation of wetlands across the country. It saw the formation of **Central Wetlands Regulatory Authority (CWRA)** whose term ended on 31 March 2015 and it wasn't reconstituted since then.
- 4) **National Environment Policy 2006:** Recognising the importance of wetlands, it calls for developing a national inventory of such wetlands and implementing a wide spectrum of policies and plans for wetland conservation and their environmental impact assessment (EIA).
- 5) **National Plan for Conservation of Aquatic Ecosystems (NPCA):** It was unveiled in 2015 to provide for policy framework and support to State Governments for integrated management of wetlands. This initiative was launched by merging two separate Centrally Sponsored Schemes (CSS), namely the National Wetlands Conservation Programme (NWCP) and the National Lake Conservation Plan (NLCP).
- 6) **Capacity Building:** in order to increase the capacity of wetland managers, up gradation of the existing **Wetland Research and Training Centre of Chilika Development Authority** at Barkul, Odisha into the National Capacity Development Centre for Wetlands is under consideration

Ramsar sites (As on December,2021)

Sl. No.	Name of Site	State Location	Date Declaration	of Area (in Sq. km.)
1	Kolleru Lake	Andhra Pradesh	19.8.2002	901
2	Deepor Beel	Assam	19.8.2002	40
3	Kabartal Wetland	Bihar	21.07.2020	26.20
4	Nalsarovar Bird Sanctuary	Gujarat	24.09.2012	120
5	Thol Lake Wildlife Sanctuary	Gujarat	05.04.2021	6.99
6	Wadhvana Wetland	Gujarat	05.04.2021	6.30
7	Sultanpur National Park	Haryana	25.05.2021	1.425
8	Bhindawas Wildlife Sanctuary	Haryana	25.05.2021	4.12
9	Chandertal Wetland	Himachal Pradesh	8.11.2005	0.49
10	Pong Dam Lake	Himachal Pradesh	19.8.2002	156.62
11	Renuka Wetland	Himachal Pradesh	8.11.2005	0.2
12	Wular Lake	Jammu & Kashmir	23.3.1990	189
13	Hokera Wetland	Jammu and Kashmir	8.11.2005	13.75
14	Surinsar-Mansar Lakes	Jammu and Kashmir	8.11.2005	3.5
15	Tsomoriri Lake	Jammu and Kashmir	19.8.2002	120
16	Asthamudi Wetland	Kerala	19.8.2002	614
17	Sasthamkotta Lake	Kerala	19.8.2002	3.73
18	Vembanad Kol Wetland	Kerala	19.8.2002	1512.5
19	Tso Kar Wetland Complex	Ladakh	17.11.2020	95.77
20	Bhoj Wetlands	Madhya Pradesh	19.8.2002	32.01
21	Lonar Lake	Maharashtra	22.7.2020	4.27
22	Nandur Madhameshwar	Maharashtra	21.6.2019	14.37
23	Loktak Lake	Manipur	23.3.1990	266
24	Bhitarkanika Mangroves	Orissa	19.8.2002	650
25	Chilka Lake	Orissa	1.10.1981	1165
26	Beas Conservation Reserve	Punjab	26.9.2019	64.289
27	Harike Lake	Punjab	23.3.1990	41
28	Kanjli Lake	Punjab	22.1.2002	1.83
29	Keshopur-Miani Community Reserve	Punjab	26.9.2019	3.439
30	Nangal Wildlife Sanctuary	Punjab	26.9.2019	1.16
31	Ropar Lake	Punjab	22.1.2002	13.65
32	Keoladeo Ghana NP	Rajasthan	1.10.1981	28.73

33	Sambhar Lake	Rajasthan	23.3.1990	240
34	Point Calimere Wildlife and Bird Sanctuary	Tamil Nadu	19.8.2002	385
35	Rudrasagar Lake	Tripura	8.11.2005	2.4
36	Haiderpur Wetland	Uttar Pradesh	8.12.2021	69.08
37	Nawabganj Bird Sanctuary	Uttar Pradesh	19.9.2019	2.246
38	Parvati Agra Bird Sanctuary	Uttar Pradesh	2.12.2019	7.22
39	Saman Bird Sanctuary	Uttar Pradesh	2.12.2019	52.63
40	Samaspur Bird Sanctuary	Uttar Pradesh	3.10.2019	79.94
41	Sandi Bird Sanctuary	Uttar Pradesh	26.9.2019	30.85
42	Sarsai Nawar Jheel	Uttar Pradesh	19.9.2019	16.13
43	Sur Sarovar	Uttar Pradesh	21.8.2020	4.31
44	Upper Ganga River (Brijghat to Narora Stretch)	Uttar Pradesh	8.11.2005	265.9
45	Asan Conservation Reserve	Uttarakhand	21.7.2020	4.444
46	East Kolkata Wetlands	West Bengal	19.8.2002	125
47	Sunderbans Wetland	West Bengal	30.1.2019	4230

(Source: Ministry of Environment & Forests, Government of India)