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WETLAND CONSERVATION AND MANAGEMENT

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Introduction

A wetland is a land area which is saturated with water, either permanently or seasonally, such that it takes on the characteristics of a distinct ecosystem. It is considered as the most biologically diverse of all ecosystems, serving as home to variety of plant and animal life. Wetlands constitute a vital component of our ecosystem. They are low lying area and can be called as ecotone. Wetlands are the ecosystem in which sand is hydric because soil is totally saturated with water. Wetlands that are situated along the floodplains of rivers are called floodplain wetlands. Roughly 12% of the earth's surface is covered by wetlands: of this 5% is under floodplain wetlands. It is totally chocked with organic matter. Wetlands found in both inland and marine area. They help in reducing the impact from storm, attenuate flood, recharge ground water, maintain water quality, store carbon; keeps stabilize climatic conditions, control pests and works as kidneys of the landscape.

Types of Wetland

Coastal Wetlands

- They are found in the areas between open sea and land that are not influenced by rivers i.e., Beaches, mangroves coral reefs and shoreline etc.

Shallow lakes and ponds

- These wetlands are areas of permanent or semi-permanent water with little flow. They include spring pools, vernal pools, salt lakes and volcanic crater lakes.
- They are shallow, small, intermittently flooded depressions in grasslands or forests,and are often only wet in winter and early spring.

Bogs

- Bogs are waterlogged peat lands in old lake basins or depressions in the landscape. Almost all water in bogs comes from rainfall.
- Bogs have specialized and unique flora that have evolved in their nutrient-poor and acidic conditions, including for example the carnivorous pitcher plant.
- Water source is rain water. Typical vegetation dominated by insectivorous plant like venus fly trap and pitcher plant other plants like sphagnum (acidic moss) also present.
- pH ranges from 3.2 to 4.7 and base fully devoid of oxygen.

Marshes and Swamps

- Also known as palustrine wetlands, marshes, swamps, and fens account for almost half of all wetlands throughout the world.
- Marshes form in depressions in the landscape, as fringes around lakes, and alongslow-flowing streams and rivers.
- Trees and shrubs are absent in marsh and swamps are dominated by trees.

Estuaries

- Area where rivers meet the sea and water changes from fresh to salt can gives an extremely rich mix of biodiversity.
- It includes deltas, and salt marshes. Mudflats and Seagrass beds in particular provides better food for many species of insects, fish, birds, turtles and other species. They provide nutritive condition to different type of fish species.

Factors Affecting Wetland

- Urbanization
- Impervious surface
- Construction of bridges and highways
- Sanitary landfills
- Industries effluents (PAH's & radioactive metals)
- Untreated runoff
- Alien species
- Peat mining

Why conserve wetlands?

Wetlands are among the world's most productive environments. They are wellsprings of biological diversity, providing the water and primary productivity upon which countless species of plants and animals depend for survival. They support diversity of birds, mammals, reptiles, amphibians, fish and invertebrate species. Wetlands are also store houses of plant genetic material. For example, Rice is a common wetland plant. It is the important diet of more than half of humanity. Our over-exploitation of water resources puts at risk human well-being and the environment. Access to safe water, human health, food production, economic development and geopolitical stability are made less secure by the degradation of wetlands driven by the rapidly widening gap between water demand and supply. Even with current attempts to maintain minimum water flows for ecosystems, the capacity of wetlands to continue to deliver benefits to people and biodiversity, including clean and reliable water supplies, is declining. This has led to large expenditures to restorelost or degraded hydrological and biological functions of wetlands.

Types of Approaches for Wetland Management

1. Passive approach : Renewing wetland functions is to remove the factors causing wetland degradation or loss and let nature do the work of re-establishing the wetland. Natural regeneration ofwetland plant communities, natural decolonization by animals, and re-establishment of wetland hydrology and soils. Most appropriate when the degraded site still retains basic wetland characteristics and the source of the degradation is an action that can be stopped. The benefits are low cost and a high degree of certainty.

2. Active approach : Physical intervention in which humans directly control site processes to restore,create, or enhance wetland systems. Methods include re-contouring a site to the desired topography, changing the water flow with water control structures (i.e., weirs or culverts), intensive planting and seeding, intensive non-native species control, and bringing soils to the site to provide the proper substrate for native species. Most appropriate when a wetland is severely degraded or when goals cannot be achieved in any other way, as is the case with wetland creation and most enhancements.

The Ramsar Convention in Wetlands

The Convention on Wetlands of International Importance holds the unique distinction of being the first modern treaty between nations aimed at conserving natural resources. The signing of the Convention on Wetlands took place in 1971 at the small Iranian town of Ramsar. Since then, the Convention on Wetlands has been known as the Ramsar Convention. The Ramsar Convention's broad aims are to halt the worldwide loss of wetlands and to conserve, through wise use and management, those that remain. This requires international cooperation, policy making, capacity building and technology transfer.

Ramsar Wetland Sites in India

Sl. No.	Name of Site	State Location	Date of Declaration	Area (in Sq. km.)
1	Asan Conservation Reserve	Uttarakhand	21.7.2020	4.444
2	Asthamudi Wetland	Kerala	19.8.2002	614
3	Beas Conservation Reserve	Punjab	26.9.2019	64.289
4	Bhitarkanika Mangroves	Orissa	19.8.2002	650
5	Bhoj Wetlands	Madhya Pradesh	19.8.2002	32.01
6	Chandertal Wetland	Himachal Pradesh	8.11.2005	0.49
7	Chilka Lake	Orissa	1.10.1981	1165
8	Deepor Beel	Assam	19.8.2002	40
9	East Kolkata Wetlands	West Bengal	19.8.2002	125
10	Harike Lake	Punjab	23.3.1990	41
11	Hokera Wetland	Jammu and Kashmir	8.11.2005	13.75
12	Kabartal Wetland	Bihar	21.07.2020	26.20
13	Kanjli Lake	Punjab	22.1.2002	1.83
14	Keoladeo Ghana NP	Rajasthan	1.10.1981	28.73
15	Keshopur-Miani Community Reserve	Punjab	26.9.2019	3.439
16	Kolleru Lake	Andhra Pradesh	19.8.2002	901
17	Loktak Lake	Manipur	23.3.1990	266
18	Lonar Lake	Maharashtra	22.7.2020	4.27
19	Nalsarovar Bird Sanctuary	Gujarat	24.09.2012	120
20	Nandur Madhameshwar	Maharashtra	21.6.2019	14.37
21	Nangal Wildlife Sanctuary	Punjab	26.9.2019	1.16
22	Nawabganj Bird Sanctuary	Uttar Pradesh	19.9.2019	2.246
23	Parvati Agra Bird Sanctuary	Uttar Pradesh	2.12.2019	7.22
24	Point Calimere Wildlife and Bird Sanctuary	Tamil Nadu	19.8.2002	385
25	Pong Dam Lake	Himachal Pradesh	19.8.2002	156.62
26	Renuka Wetland	Himachal Pradesh	8.11.2005	0.2
27	Ropar Lake	Punjab	22.1.2002	13.65
28	Rudrasagar Lake	Tripura	8.11.2005	2.4
29	Saman Bird Sanctuary	Uttar Pradesh	2.12.2019	52.63
30	Samaspur Bird Sanctuary	Uttar Pradesh	3.10.2019	79.94

Sl. No.	Name of Site	State Location	Date of Declaration	Area (in Sq. km.)
31	Sambhar Lake	Rajasthan	23.3.1990	240
32	Sandi Bird Sanctuary	Uttar Pradesh	26.9.2019	30.85
33	Sarsai Nawar Jheel	Uttar Pradesh	19.9.2019	16.13
34	Sasthamkotta Lake	Kerala	19.8.2002	3.73
35	Sunderbans Wetland	West Bengal	30.1.2019	4230
36	Surinsar-Mansar Lakes	Jammu and Kashmir	8.11.2005	3.5
37	Sur Sarovar	Uttar Pradesh	21.8.2020	4.31
38	Tso Kar Wetland Complex	Ladakh	17.11.2020	95.77
39	Tsomoriri Lake	Jammu and Kashmir	19.8.2002	120
40	Upper Ganga River (Brijghat to Narora Stretch)	Uttar Pradesh	8.11.2005	265.9
41	Vembanad Kol Wetland	Kerala	19.8.2002	1512.5
42	Wular Lake	Jammu & Kashmir	23.3.1990	189

Three Pillars of the Convention

1. Wise Use

- Maintenance of their ecological character, achieved through the implementation of ecosystem approaches, within the context of sustainable development".

2. Wetlands of International Importance

- "Promote the conservation" of all of those listed sites, and this system forms the world's largest network of protected areas.

3. International Cooperation

- Trans-boundary wetlands, shared water systems and shared or migratory species, andto share expertise and resources with Parties less able to meet their commitments.

How to Reduce Wetland Loss

- Identified and understand ecosystem
- Use different technology like remote sensing, GPS, GIS etc. all these aids can help informing map and data.
- We should learn about our natural ecosystem
- Mapping tools can help us.
- Reduction of pollution
- Laws and legislation should apply on these types of issue
- Stop invade of invasive species
- By raising awareness through various initiatives and projects aimed at students, teachers, media and the general public, as well as through more technical tools, including consultations, workshops, books and research focusing on international policy and communication.
- By fencing.

Fisheries Management

- **Capture fishery for open wetlands** : allow natural fish recruitment where optimum ecological conditions, protection of breeding ground.
- **Culture-based fishery for closed wetlands :** cage culture, pen culture, stocking and recapture
- **Capture and culture-based fisheries :** wild stock capture for maintenance of genetic diversity, stocking of high genetic profile fish species
- **Integrated management :** habitat restoration, paddy cum fish culture, macrophytesused as aquifers
- **Species options :** introduction of high genetic profile fish species, restocking ofnative species
- **Restoration, enhancement and preservation** : ranching, active approachmanagement, passive approach management.

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