



Wetlands Conservation

For Prelims: Wetland Conservation, Mangrove, Peatlands, eco-systems

For Mains: Wetland and its Importance, Environmental Pollution and Degradation

Why in News?

In this **Anthropocene** era, human interference can be seen in every component of Earth's ecosystem. Due to such human-mediated changes, the loss of Shallow Wetlands such as lakes, ponds are becoming a major concern.

- The **Anthropocene Epoch** is an unofficial unit of geologic time, used to describe the **most recent period in Earth's history** when human activity started to have a significant impact on the planet's climate and ecosystem.

What are the Shallow Water Wetlands?

- **About:**
 - These wetlands are **areas of permanent or semi-permanent water** with little flow. They include vernal ponds, spring pools, salt lakes and volcanic crater lakes.
 - They are of enormous ecological importance and human need (such as drinking water and inland fisheries).
 - Because of its shallow nature, **sunlight penetrates the bottom of the water body.**
 - The temperature is isothermal, with a continuous mixing process (circulating top-to-bottom on a regular basis, **especially in a tropical country like India**).
- **Concerns:**
 - Over time, these water bodies **get filled by sediments coming from the catchment.**
 - Hence, the depth of the water column gradually declines. It is quite obvious that a small change in the temperature and rainfall pattern would have a cascade of ecological effects on this type of water body.
 - From 1901-2018, **India's average temperature has risen by 0.7 degrees Celsius.** The rise is attributed to greenhouse gas-induced warming as well as land-use and land-cover change, according to a 2020 report by the Union Ministry of Earth Sciences.
 - Such changes in temperature and heat distribution across the regional scale will have an impact on the rainfall pattern. Therefore, there is an **increasing threat to India's natural ecosystems**, freshwater resources, and agriculture, which ultimately impact biodiversity, food, water security, public health and society as a whole.
 - An example of **Surajpur Bird Sanctuary** (an urban wetland in Yamuna River basin) -In October 2019, the water level in Surajpur wetlands was low with high algal production as well as smell and odour issues.

What are Wetlands?

- **About:**

- Wetlands are areas where water is the primary factor controlling the environment and the associated plant and animal life. They occur where the water table is at or near the surface of the land, or where the land is covered by water.
- Wetlands are defined as: "lands transitional between terrestrial and aquatic eco-systems where the water table is usually at or near the surface or the land is covered by shallow water".
- Often called "**nature's kidneys**" and "**nature's supermarket**", wetlands support millions of people by providing food, and water, and controlling floods and storm surges.
- **Types:**
 - **Coastal Wetlands:**
 - Coastal wetlands are found in the areas between land and open sea that are not influenced by rivers such as shorelines, beaches, mangroves and coral reefs.
 - A good example is the mangrove swamps found in sheltered tropical coastal areas.
 - **Marshes:**
 - These are periodically saturated, flooded, or ponded with water and characterized by herbaceous (non-woody) vegetation adapted to wet soil conditions. Marshes are further characterized as tidal marshes and non-tidal marshes.
 - **Swamps:**
 - These are fed primarily by surface water inputs and are dominated by trees and shrubs. Swamps occur in either freshwater or saltwater floodplains.
 - **Bogs:**
 - Bogs are waterlogged peatlands in old lake basins or depressions in the landscape. Almost all water in bogs comes from rainfall.
 - **Estuaries:**
 - The area where rivers meet the sea and water changes from fresh to salt can offer an extremely rich mix of biodiversity. These wetlands include deltas, tidal mudflats and salt marshes.

What is the Importance of Wetlands?

- **Highly Productive Ecosystems:** Wetlands are highly productive ecosystems that provide the world with nearly two-third of fish harvest.
- **Integral Role in the Ecology of the Watershed:** The combination of shallow water, high levels of nutrients are ideal for the development of organisms that form the base of the food web and feed many species of fish, amphibians, shellfish and insects.
- **Carbon Sequestration:** Wetlands' microbes, plants and wildlife are part of global cycles for water, nitrogen and sulphur. Wetlands store carbon within their plant communities and soil instead of releasing it to the atmosphere as carbon dioxide.
- **Lowering Flood Heights and Reduces Soil Erosion:** Wetlands function as natural barriers that trap and slowly release surface water, rain, snowmelt, groundwater and flood waters. Wetland vegetation also slow the speed of flood waters lowering flood heights and reduces soil erosion.
- **Critical to Human and Planet Life:** More than one billion people depend on them for a living and 40% of the world's species live and breed in wetlands.

What are the Threats to Wetlands?

- **Urbanisation:** Wetlands near urban centres are under increasing developmental pressure for residential, industrial and commercial facilities. Urban wetlands are essential for preserving public water supplies.
 - Delhi has more than 1,000 lakes, wetlands and ponds, according to the estimates of the Delhi Wetland Authority.
 - But most of these are threatened by **rampant encroachment (both planned and unplanned), pollution through dumping of solid waste** and construction debris.
- **Agriculture:** Vast stretches of wetlands have been converted to paddy fields. Construction of a large number of reservoirs, canals and dams to provide for irrigation significantly altered the hydrology of the associated wetlands.
- **Pollution:** Wetlands act as natural water filters. However, they can only clean up the fertilizers and pesticides from agricultural runoff but not mercury from industrial sources and other types of

pollution.

- There is growing concern about the effect of industrial pollution on drinking water supplies and the biological diversity of wetlands.
- **Climate Change:** Increased air temperature, shifts in precipitation, increased frequency of storms, droughts, and **floods**, **increased atmospheric carbon dioxide** concentration, and sea level rise could also affect wetlands.
- **Dredging:** The removal of material from a wetland or river bed. Dredging of streams lowers the surrounding water table and dries up adjacent wetlands.
- **Draining:** Water is drained from wetlands by cutting ditches into the ground which collect and transport water out of the wetland. This lowers the water table and dries out the wetland.

What are the Efforts towards Wetlands Conservation?

- **Initiatives at Global Level:**
 - The **United Nations declared 2021-2030 the Decade on Ecosystem Restoration** with the aim to conserve and restore the terrestrial, aquatic and marine ecosystems.
 - [Ramsar Convention](#)
 - [Montreux Record](#)
 - [World Wetlands Day](#)
- **Initiatives at National Level:**
 - [Wetlands \(Conservation and Management\) Rules, 2017.](#)
 - [Action Plan of MoEFCC](#)

Way Forward

- To counter unplanned urbanization and a growing population, management of wetlands has to be **an integrated approach in terms of planning, execution and monitoring.**
- Effective **collaborations among academicians and professionals**, including ecologists, watershed management specialists, planners and decision makers for overall management of wetlands.
- Spreading awareness by **initiating awareness programs** about the importance of wetlands and constant monitoring of wetlands for their water quality would provide vital inputs to safeguard the wetlands from further deterioration.

UPSC Civil Services Examination, Previous Year Question (PYQ)

Prelims

Q1. "If rainforests and tropical forests are the lungs of the Earth, then surely wetlands function as its kidneys." Which one of the following functions of wetlands best reflects the above statement? (2022)

- (a)** The water cycle in wetlands involves surface runoff subsoil percolation and evaporation.
- (b)** Algae form the nutrient base upon which fish, crustaceans, molluscs, birds, reptiles and mammals thrive.
- (c)** Wetlands play vital role in maintaining sedimentation balance and soil stabilization.
- (d)** Aquatic plants absorb heavy metals and excess nutrients.

Ans: (c)

Exp:

- Wetlands are great filters. They trap sediments and remove pollutants, which helps to purify water. Wetlands help to control erosion. Wetlands work like giant sponges. They store water and then slowly release it and this helps to deal with dry seasons with little rainfall. Thus, wetlands play an important role in maintaining sediment balance and soil stabilization.
- **Hence, option (b) is correct.**

Q2. Consider the following statements: (2019)

1. Under Ramsar Convention, it is mandatory on the part of the Government of India to protect and conserve all the wetlands in the territory of India.
2. The Wetlands (Conservation and Management) Rules, 2010 were framed by the Government of India based on the recommendations of Ramsar Convention.
3. The Wetlands (Conservation and Management) Rules, 2010 also encompass the drainage area or catchment regions of the wetlands as determined by the authority.

Which of the statements given above is/are correct?

- (a) 1 and 2 only
- (b) 2 and 3 only
- (c) 3 only
- (d) 1, 2 and 3

Ans: (c)

Mains

Q. What is wetland? Explain the Ramsar concept of 'wise use' in the context of wetland conservation. Cite two examples of Ramsar sites from India. **(2018)**

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