



Sundarbans

For Prelims: [Sundarbans](#), [Estuarine crocodile](#), Water monitor lizard, [Gangetic dolphin](#), [Olive ridley turtle](#), [Bay of Bengal](#)

For Mains: [Sundarbans](#), [Challenges Related to Sundarban](#)

[Source: Statesman](#)

Why in News?

Recently, a study conducted by prominent environmental scientists has warned about the substantial threat of [air pollution](#) to the [Sundarbans](#), an essential [mangrove ecosystem](#) in West Bengal.

What is Sundarbans?

▪ About:

- The **Sundarbans** hosts the largest mangrove forests in the world, lying on the **delta of the [Ganges, Brahmaputra and Meghna rivers](#)** on the [Bay of Bengal](#).
- The mangrove ecosystem is a **ecotone** between the land and the sea in the tropical and subtropical regions.

▪ Flora and Fauna:

- Due to the ecotonic effect this zone fosters a rich blend of habitats, from freshwater swamps and intertidal mangroves to saline forests and open water.
 - The Sundarbans is a sanctuary for a wide variety of species from different habitats, including rare and globally threatened wildlife such as the [estuarine crocodile](#), water monitor lizard, [Gangetic dolphin](#), and [olive ridley turtle](#).

▪ Protection:

- **40% of Sundarban lies in India** and the rest in Bangladesh.
- It was designated a [UNESCO World Heritage site](#) in 1987 (India) and 1997 (Bangladesh).
- Sundarban Wetland, India was recognised as the '**Wetland of International Importance**' under the [Ramsar Convention](#) in January 2019.
- **Project Tiger:** [Royal Bengal Tigers](#) in the Sundarbans are top predators that control prey populations, preventing overgrazing and maintaining the delicate balance of the ecosystem.
 - **Protecting tigers** also safeguards a vast habitat for other plant and animal species, contributing to a **healthy forest ecosystem** in the Sundarbans.
- In 2011, **India and Bangladesh signed an MoU on Conservation of the Sundarbans**, recognising the need to monitor and conserve the Sundarbans.

What are the Challenges Faced by the Sundarbans?

- **Rising Sea Levels:** A consequence of climate change, **rising sea levels** threaten to inundate low-lying mangroves. This **saltwater intrusion disrupts their delicate** balance and makes them more vulnerable to **storm surges during [cyclones](#)**.

- **Increased Intensity of Cyclones:** Climate change is also linked to more frequent and intense storms. These cyclones can batter mangroves, causing **physical damage** and disrupting sediment patterns crucial for their survival.
- **Cash and Food Crops:** The conversion of mangrove forests for agriculture like cash crops (palm oil) or food production (rice paddies) destroys their habitat.
 - This not only reduces the area available for these ecosystems but also fragments existing ones, impacting biodiversity.
- **Loss of Ecosystem Services:** Mangroves provide crucial services like **shoreline protection and nursery grounds for fish**. Deforestation disrupts these services, impacting coastal communities and fisheries.
- **Threat to Wildlife:** The loss of mangrove habitats due to [climate change](#) is leading to the loss of species in the near-threatened or endangered category.
 - Settlement mangroves used to be safe havens for diverse molluscs and crustaceans, but they are disappearing due to polluted discharges and breeding activities of these species.
- **Effect of Pollutants:** Pollutants, enriched with [black carbon](#) or soot particles, from nearby urban areas and the entire [Indo-Gangetic Plain region](#) are worsening the air quality of the Sundarbans, impacting its ecosystem.
 - These air pollutants significantly affect the ecology and biogeochemistry of the Sundarbans mangrove ecosystem.

Way Forward

- **Protecting Streambanks:** Cultivating [native grass species](#) like wild rice, *Myriostachya wightiana*, biscuit grass, and salt couch grass can stabilise streambanks and prevent erosion, instead of introducing non-local species like vetiver, which are not **salt-tolerant**.
- **Promoting Sustainable Agriculture:** Promoting soil-tolerant paddy varieties and [organic agriculture](#) practices can increase agricultural productivity and income for farmers while minimising environmental impact.
 - Implementing [rainwater harvesting](#) and [watershed development initiatives](#) will further enhance agricultural production.
- **Wastewater Treatment:** Using natural processes and microorganisms for wastewater treatment, such as lactic acid bacteria and photosynthetic bacteria, can support water quality and ecosystem health.
- **India-Bangladesh Collaboration:** The India-Bangladesh Joint Working Group (JWG) should be transformed into a **high-powered board of interdisciplinary experts** to plan and implement climate resilience for the Sundarbans and the communities dependent on it.
- **Innovative Solutions:** The corrective measures include solar energy promotion, electric transportation, subsidised LPG, regulated tourism, closing down of pollutant factories, regulation of brick kilns and land use and [strengthening of coastal regulations](#).
- **Multi-Sectoral Approach:** A multilayered approach to multi-engagement and multidimensional planning can be followed by the ministries of tourism, [disaster management](#), agriculture, fisheries, and rural development.

Drishti Mains Question:

Q. Discuss the environmental and socio-economic challenges faced by the Sundarbans region. Suggest measures for sustainable development and conservation in the region.

UPSC Civil Services Examination, Previous Year Question (PYQ)

Prelims:

Q. Consider the following protected areas: (2012)

1. Bandipur
2. Bhitarkanika
3. Manas

4. Sundarbans

Which of the above are declared Tiger Reserves?

- (a) 1 and 2 only
- (b) 1, 3 and 4 only
- (c) 2, 3 and 4 only
- (d) 1, 2, 3 and 4

Ans: (b)

Q. With reference to India's biodiversity, Ceylon frogmouth, Coppersmith barbet, Gray-chinned minivet and White-throated redstart are (2020)

- (a) Birds
- (b) Primates
- (c) Reptiles
- (d) Amphibians

Ans: (a)

Mains

Q. "The most significant achievement of modern law in India is the constitutionalization of environmental problems by the Supreme Court." Discuss this statement with the help of relevant case laws. **(2022)**

Q. "Policy contradictions among various competing sectors and stakeholders have resulted in inadequate 'protection and prevention of degradation' to the environment." Comment with relevant illustrations. **(2018)**