



Sundarbans

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

For Mains: Sundarbans, Challenges Related to Sundarban, Nature-based Solutions.

Source: DTE

Why in News?

The [Sundarbans](#) face numerous environmental challenges including freshwater scarcity, pollution from microplastics and chemicals, and coastal erosion, making it important to look for sustainable solutions to protect it.

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 specialised environment between the land and the sea in the tropical and subtropical regions.

▪ Flora Fauna:

- It provides shelter for **84 species of flora, including 26 mangrove species, 453 species of fauna**, 120 species of fish, 290 species of birds, 42 species of mammals, 35 reptiles and eight amphibian species. More than 12 million people — 4.5 million in India and 7.5 million in Bangladesh — live in this estuarine ecosystem.
- Sundarban is the natural **abode of many animal groups and many species** are known to feed, breed and take shelter in this ecosystem.
 - It is home to many rare and globally threatened wildlife species 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. Sundarban 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:** [Project Tiger](#) is one of the most important steps in conserving the Sundarbans unique ecosystem because it protected the entire forest by preserving the Royal Bengal Tiger population.
- **MOU between India and Bangladesh on Conservation of the Sundarban:** In 2011 Both India and Bangladesh signed an MoU on Conservation of the Sundarbans, recognising the need to monitor and conserve the Sundarbans.
- **Biosphere Reserve:**
 - Sundarbans is also a [Biosphere Reserve \(BR\)](#), Within which there are several

protected areas, including national parks and wildlife sanctuaries, they are,

- [Sundarbans National Park \(India\)](#)
- [Sundarbans East Wildlife Sanctuary \(India\)](#)
- Sundarbans South Wildlife Sanctuary (India)
- Sundarbans West Wildlife Sanctuary (India)
- Sundarbans Reserve Forest (Bangladesh)



Spanning across India and Bangladesh, Sundarbans is amongst the world's largest contiguous blocks of mangrove forest. Less than 40 percent of Sundarbans is located in India and the rest is in Bangladesh. On the Indian side, forest boundaries have changed very little since 1943.

What are the Challenges Faced by the Sundarbans?

▪ Freshwater Scarcity:

- The Sundarbans experience scarcity of freshwater due to the predominantly **saline nature of the rivers**, impacting both the ecosystem and the livelihoods of inhabitants.
 - According to the observations of the experts, fresh groundwater may be found deeper than **250 metres and, in some cases**, the groundwater is saline in nature in Sundarbans.

▪ Pollution and Erosion:

- Pollution from various sources, including microplastics, chemicals from industrial activities, and waste disposal, threatens the delicate ecosystem of the **Sundarbans and the health of its inhabitants**.
 - In some of the study reports, it was found **four million tonnes of microplastics are released** into the [Bay of Bengal](#) and the Sundarbans each year from various rivers in Bangladesh and India.
- **Very little fresh (sweet) water enters the Sundarbans mangrove system**. Some of the major impacting factors are river erosion and exploitation of forest resources.
 - Moreover, the use of **non-forest land for mangrove forestation** further exacerbates the situation.

▪ Sea Level Rise:

- Sundarbans face nearly double the [sea level rise](#) compared to other coastal regions.
- Also, the increasing frequency and intensity of [cyclones](#) in this region pose a serious threat to its [carbon sequestration](#) potential and other [ecosystem services](#) of this mangrove forest.
- Rising temperatures, sea levels, and changes in biodiversity due to climate change are putting additional stress on the Sundarbans ecosystem and its inhabitants.

▪ Human-Wildlife Conflict:

- Conflicts between humans and animals, particularly with species like tigers, pose a **significant challenge to both conservation efforts** and the safety of local

communities.

▪ **Contamination:**

- Chemicals such as **hydrocarbons and marine paints**, caused by Bangladesh's Mongla Port and India's Leather Estate, **contaminate the rivers and water ecosystem.**

What can be Done to Protect the Sundarbans?

▪ **Protecting Streambanks:**

- Instead of introducing non-local **species like vetiver**, cultivating native grass species such as **wild rice** (*Porteresia coarctata*), **Myriostachya wightiana**, biscuit grass (*Paspalum vaginatum*), and salt couch grass (*Sporobolus virginicus*) can help stabilise **streambanks and prevent erosion.**

- Vetivers are not local species and are **not salt-tolerant.**

▪ **Promoting Sustainable Agriculture:**

- Encouraging the cultivation of soil-tolerant paddy varieties such as **Darsal, Nona Bokra, Talmugur**, etc and crop cultivation and promoting organic agriculture practices can enhance agricultural productivity **while minimising environmental impact.**
- Additionally, **promoting organic agriculture** can help farmers increase their income while maintaining environmental health.
 - Implementing rainwater harvesting and watershed development initiatives will further enhance agricultural production.

▪ **Utilising Non-Timber Forest Resources:**

- Leveraging non-timber forest resources for economic growth can promote sustainable development while **ensuring the conservation of natural resources.**
 - Mangroves can be climate protectors and sources of livelihood. There are many mangroves such as **Bayen, Garjan, Golpata, Hogla, Hetal, Kankra, Kumbhi, Kayora, Nona Jhau**, Posur, Goran, Gewoya, Sundari, etc. in this area.
 - These mangroves have **economical as well as medicinal values.** Such fruits of Hetal, Kayora and Golpata can be sold in commercial markets.
 - Flowers of Hogla can be used in the food industry to prepare **delicious cuisine and ropes can be prepared from dry leaves.**

▪ **Wastewater Treatment:**

- Utilising natural processes and microorganisms for wastewater treatment, including **lactic acid bacteria and photosynthetic bacteria**, can help **maintain water quality and ecosystem health.**

▪ **Biodiversity Conservation:**

- Promoting the conservation of biodiversity, including indigenous fish species like **major carp**, can aid in restoring and maintaining the health of the Sundarbans' ecosystems.

▪ **India-Bangladesh Collaboration:**

- The **India-Bangladesh Joint Working Group (JWG)** can be converted into a joint high-powered board and a set of interdisciplinary experts to plan and implement climate resilience of the Sundarbans and the welfare of the communities dependent on this ecosystem.
- Institutional mechanisms should be blended with the flexibility to work across multiple sectors, engaging locals for tackling the on ground issues effectively.
 - The two nations can learn from several international initiatives such as the [Amazon Cooperation Treaty Organisation](#) and the **Senegal River Basin Development Organisation.**

Conclusion

- These nature-based solutions emphasise the importance of working with, rather than against, nature to address the complex challenges facing the Sundarbans ecosystem.
- By integrating nature based approaches into **development plans and policies, stakeholders can promote** the long-term health and sustainability of the Sundarbans and its inhabitants.

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)