

Mangroves in India

Prelims: Current events of national and international importance | Ecology & Environment

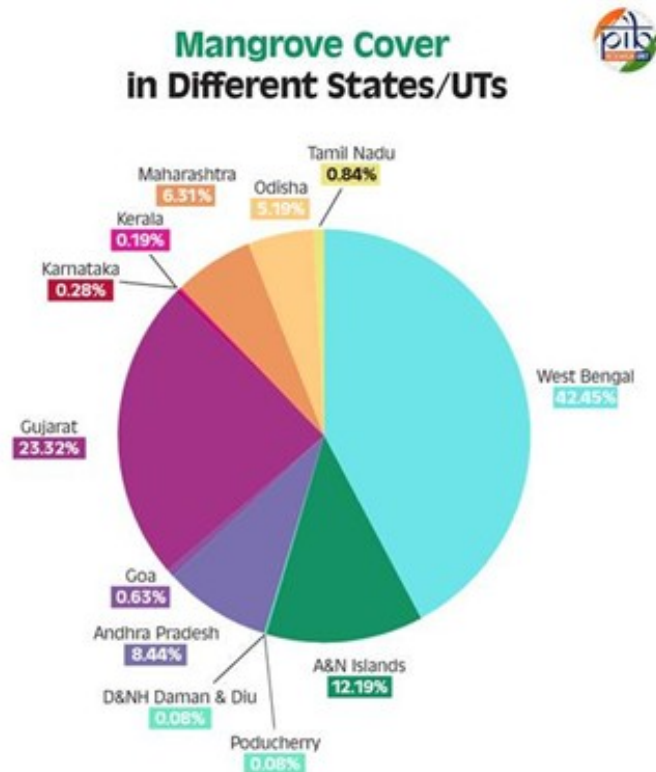
Why in news?

Recently, researchers studied how mangrove cells enable the plants to survive in saltwater.

- **Mangrove** - It is a **salt-tolerant plant** community found in **tropical and subtropical** intertidal regions.
- **Climate requirement** - Mangroves can thrive in high-rainfall areas (1,000–3,000 mm) with temperatures ranging from 26°C to 35°C.
- **Adaptation** - Mangrove species are adapted to survive in waterlogged soils, high salinity, and frequent tidal surges.
- **Ecological importance** - They serve as crucial biodiversity refuges and act as bio-shields against extreme climatic events.
- Additionally, rural populations depend on mangroves for biomass-based livelihoods.
- **Nature's Carbon Vault** - As per **World Wildlife Fund** mangroves store **7.5-10 times more carbon per acre** than tropical forests.
- Their loss contributes to ***10% of global greenhouse gas emissions*** from deforestation.
- **India State of Forest Report, 2023** -
 - India's total mangrove cover stands at 4,991.68 sq. km, constituting **0.15%** of the nation's geographical area.
 - From 2013 to 2023, mangrove cover in the country increased by 363.68 sq. km (7.86%).
 - From 2001 to 2023, mangrove cover increased by 509.68 sq. km (11.4%).
 - **Highest share** - **West Bengal (42.45%)** holds the largest share, followed by Gujarat (23.32%) and Andaman & Nicobar Islands (12.19%).

- **Key Regulatory Measures**

- **Mangroves as ESAs** - Mangroves are classified as Ecologically Sensitive Areas (ESAs) under the Environment (Protection) Act, 1986 by **Coastal Regulation Zone (CRZ) Notification**, 2019.
- **Buffer Zone Rule** - Activities are restricted **within a 50-metre buffer zone** if mangrove cover is more than 1,000 sq. m under the 2019 notification.
- **Replantation Mandate** - If mangroves are damaged by development, compensatory replantation must be done at a **3:1 ratio**.



- **Additional protection** - Under the Wildlife (Protection) Act, 1972, Indian Forest Act, 1927, and Biological Diversity Act, 2002.

To know more about Mangrove Ecosystem, Click [here](#)

Quick Fact

How mangrove's cells helps plants survive in saltwater?

Key Insights

- **Mangroves vs. other plants** - Saltwater would kill most plants, but mangroves thrive due to specialized adaptations.
- **Cell traits identified** - ***Small epidermal pavement*** cells help reduce stress from saline conditions.
- ***Thicker cell walls*** provide mechanical strength against osmotic pressure.
- **Salt management strategies** -
 - Some species exclude salt using a **waxy root layer** that filters it out.
 - Others absorb salt but then **excrete it through leaves** using specialized tissues.
- **Evolutionary resilience** - Mangroves have evolved around **30 times over 200 million years**, adapting repeatedly to saline environments.

References

1. [The Hindu | How mangroves' cells helps plants survive in saltwater](#)
2. [PIB | Mangroves as Guardians of Life and Livelihoods](#)

