



IUCN Report on Mangrove Ecosystems

For Prelims: [International Day for the Conservation of the Mangrove Ecosystem](#), [UN Educational, Scientific and Cultural Organization](#), [Indian State Forest Report 2021](#), [Sundarbans](#), [Royal Bengal tiger](#), [Irrawady Dolphin](#), [MISHTI \(Mangrove Initiative for Shoreline Habitats & Tangible Incomes\)](#), [Sustainable Aquaculture In Mangrove Ecosystem \(SAIME\) initiative](#).

For Mains: Significance of Mangroves, Challenges Related to Mangroves in India

Source: IE

Why in News?

The [International Union for Conservation of Nature \(IUCN\)](#) has issued a new report cautioning that half of the world's mangrove ecosystems are at risk of collapsing. This **marks the first comprehensive global assessment** of mangroves by IUCN.

- The report, titled "**Red List of Mangrove Ecosystems**," unveiled these findings on [International Day for Biodiversity \(22nd May\)](#).

What are the Key Findings of the Study?

- **About:** This study classified the world's mangrove ecosystems in **36 different regions** called provinces and assessed the threats and risk of collapse in each region.
- **Findings:**
 - **More than Half of the World's Mangrove Under Risk:**
 - Over **50%** of the world's mangrove ecosystems are at risk of collapse (classified as either vulnerable, endangered, or critically endangered), with nearly 1 in 5 facing severe risk.
 - **One-third** of the world's mangrove ecosystem provinces will be severely affected by **sea-level rise**, with 25% of the global mangrove area predicted to be submerged in the next 50 years.
 - **Higher Risk to South Indian Mangroves:**
 - Mangrove ecosystem in South India, shared with Sri Lanka and Maldives, is categorised as "**critically endangered**".
 - In contrast, mangrove ecosystems in the Bay of Bengal region (shared with Bangladesh) and the western coast (shared with Pakistan) are classified as "**least concerned**".
 - **Climate Change as a Major Threat:**
 - A study found that globally, climate change is the major threat to mangrove ecosystems, affecting 33% of mangroves.
 - It is followed by deforestation, development, pollution, and dam construction.
 - Increased frequency and intensity of [cyclones](#), **typhoons**, **hurricanes**, and **tropical storms are impacting mangroves** on certain coastlines.

- **Global Impact:**

- Coasts along the Northwest Atlantic, North Indian Ocean, Red Sea, South China Sea, and Gulf of Aden are **predicted to be significantly impacted**.
- Without increased conservation, about 7,065 sq km (5%) more mangroves could be lost, and 23,672 sq km (16%) **will be submerged by 2050**.

What is the Status of Mangroves Cover in India?

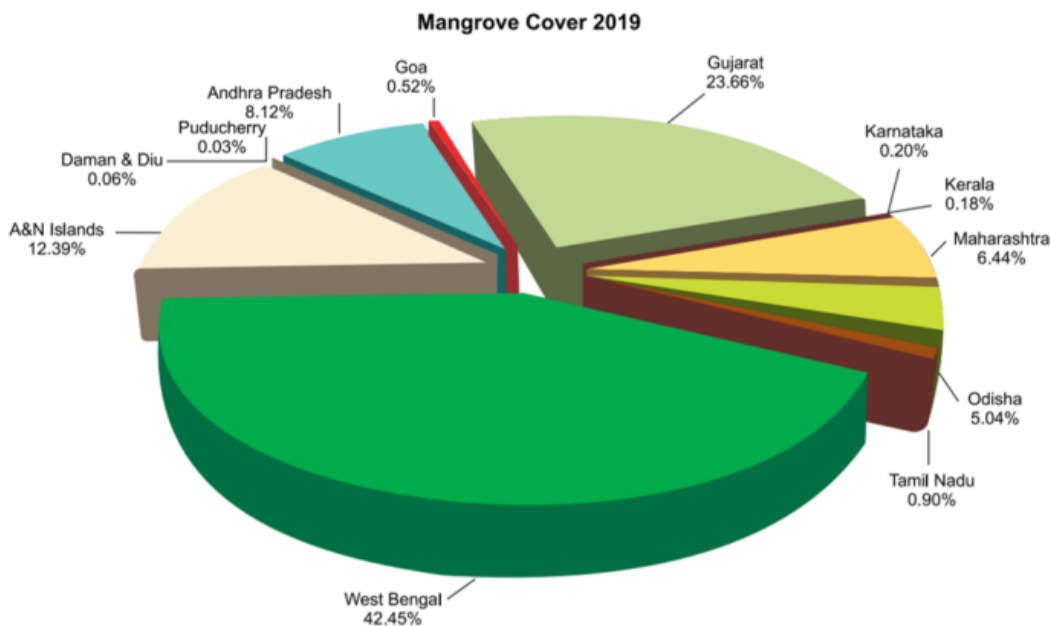
- **About:**

- Mangroves are a unique type of coastal ecosystem found in tropical and subtropical regions. They are **dense forests of salt-tolerant trees and shrubs** that thrive in intertidal zones, where land meets the sea.
- These **ecosystems are characterised by their ability to withstand harsh conditions**, such as saline water, tidal fluctuations, and muddy, oxygen-poor soils.

- **Mangrove Cover:**

- About **40%** of the world's mangrove cover is found in **South East Asia** and South Asia.
 - India has about **3%** of the total mangrove cover in South Asia.
- India's mangrove cover has increased by **54 sq km (1.10%)** compared to the previous assessment.
- The current mangrove cover in India is **4,975 sq km**, which is 0.15% of the country's total geographical area.
- **West Bengal (42.45%)** has the **largest share of India's mangrove cover**, followed by **Gujarat at 23.66%** and **Andaman & Nicobar Islands at 12.39%**.
 - The **South 24 Parganas** district of West Bengal alone accounts for **41.85% of India's mangrove cover**. This region includes the **Sundarbans National Park**, one of the largest mangrove forests in the world.
- **Gujarat** has shown the **maximum increase of 37 sq km** in mangrove cover.

// Pie Chart showing Mangrove Cover in different States & UTs



What are India's Initiatives Related to Mangroves Conservation?

- **Coastal Regulation Zone (CRZ) Notification (2019):** This notification under the **Environment (Protection) Act, 1986**, classifies coastal areas including wetlands into four categories. It restricts activities that could damage mangroves, such as:
 - Dumping of waste (industrial or otherwise).
 - Industrial activities within the CRZ.
 - Land reclamation and building in these areas.

- **Central Sector Scheme on 'Conservation and Management of Mangroves and Coral Reefs':**
 - It provides financial assistance to coastal states and union territories for implementing action plans specific to mangrove conservation. These plans can include surveying, alternative livelihoods for local communities, awareness campaigns, etc.
- **Mangrove Initiative for Shoreline Habitats & Tangible Incomes (MISHTI):** Launched in the [2023-24 Union Budget](#), MISHTI is a dedicated initiative for promoting and conserving mangroves. It aims to:
 - Increase mangrove cover along the coastline and on degraded lands.
 - Support sustainable development and protect vulnerable coastal areas.
- **Other Relevant Acts:**
 - **The Indian Forest Act, 1927:** States like Maharashtra have designated mangroves on government land as **Reserved Forests**, granting them legal protection under this act.
 - **The Wildlife Protection Act, 1972:** Some mangrove areas are crucial habitats for wildlife and receive protection under this act.
 - Additional laws like the **Water (Prevention and Control of Pollution) Act, 1974** and the **Maharashtra Tree (Felling) Act, 1972** offer further protection by regulating activities that could pollute or damage these ecosystems.

How Significant is the Mangroves Ecosystem?

- **Biodiversity Conservation:** Mangroves provide a unique habitat for a wide variety of plant and animal species, serving as breeding, nursery, and feeding grounds for numerous marine and terrestrial organisms.
 - For example, Sundarban hosts the [Royal Bengal tiger](#), [Irrawady Dolphin](#), Rhesus macaque, Leopard cats, Small Indian civet.
- **Coastal Protection:** Mangroves act as natural buffers against [coastal erosion](#), storm surges, and [tsunamis](#).
 - Their dense root systems and tangled network of prop roots stabilise shorelines and reduce the impact of waves and currents.
 - During hurricanes and cyclones, mangroves can absorb and dissipate a significant amount of energy, protecting inland areas and human settlements from devastating damage.
- **Carbon Sequestration:** Mangroves are highly efficient [carbon sinks](#), sequestering large amounts of carbon dioxide from the atmosphere and storing it in their biomass and sediments.
- **Fisheries and Livelihoods:** Mangroves support fisheries by providing nursery areas for fish and shellfish, enhancing fishery productivity and contributing to livelihood and local food security.
- **Water Quality Improvement:** Mangroves act as natural filters, trapping and removing [pollutants](#) and excess nutrients from coastal waters before they reach the open ocean.
 - Their role in purifying water contributes to the health of marine ecosystems and helps maintain the balance of fragile coastal ecosystems.
- **Tourism and Recreation:** Mangroves offer recreational opportunities such as eco-tourism, birdwatching, kayaking, and nature-based activities, which can promote sustainable economic growth for local communities.

What are the Challenges Faced by the Mangroves Ecosystem?

- **Habitat Destruction and Fragmentation:** Mangroves are often cleared for various purposes, including agriculture, [urbanisation](#), aquaculture, and infrastructure development.
 - Such activities lead to the fragmentation and loss of mangrove habitats, disrupting their ecosystem functioning and biodiversity.
 - The conversion of mangroves into shrimp farms and other commercial uses is a significant concern.
- **Climate Change and Sea Level Rise:** Rising sea levels due to climate change pose a significant threat to mangroves.
 - Climate change also brings about extreme weather events, such as **cyclones** and storms, which can cause severe damage to mangrove forests.
- **Pollution and Contamination:** Pollution from agricultural runoff, industrial discharges, and improper waste disposal contaminate mangrove habitats.
 - Heavy metals, plastics, and other pollutants adversely affect the flora and fauna of these

ecosystems.

- **Lack of Integrated Management:** Often, mangroves are managed in isolation, without considering their interconnectedness with adjacent ecosystems like [coral reefs](#) and [seagrass beds](#).
 - Integrated management approaches that consider the broader coastal ecosystem are necessary for effective conservation.
- **Overfishing and Unsustainable Harvesting:** Overfishing and unsustainable harvesting of mangrove resources, such as fish, crabs, and timber, can reduce their ecological and economic value.
- **Invasive species:** Invasive species, such as the non-native red mangrove, can outcompete native species and alter the structure and function of mangrove ecosystems.
- **Lack of awareness and protection:** Mangroves are often undervalued and lack legal protection, which can make them vulnerable to exploitation and destruction.

What can be Done to Protect Mangrove Ecosystem?

- **Cracking Down on Harmful Activities:** Implement stricter laws and enhance enforcement to prevent pollution, deforestation, and unsustainable development along the coast.
- **Mangrove Adoption Program:** Initiate a public-driven program allowing individuals, corporations, and institutions to "adopt" sections of mangroves.
 - Participants would take on the responsibility for the maintenance, protection, and restoration of their adopted areas, fostering a sense of ownership and collective responsibility.
- **Mangrove Research and Development:** Invest in research to explore novel applications of mangroves, such as using them for [phytoremediation](#) to clean polluted water or developing new medicines from mangrove plant extracts.
 - This could lead to innovative ways to leverage the unique properties of mangroves for sustainable development.
- **Empowering Local Communities:** Involve local communities, who often have a deep understanding of mangrove ecosystems, in conservation efforts.
 - Create sustainable livelihood opportunities tied to protecting mangroves, fostering a shared responsibility for their well-being.
- **Bio-Restoration Techniques:** Utilise bio-restoration techniques to revive degraded mangrove areas, helping to maintain original biodiversity.
 - Ecological restoration can accelerate mangrove recovery compared to natural regeneration.
- **Diverse Species in Restoration Efforts:** Ensure restoration efforts include a variety of mangrove species rather than monocultures.
 - This approach will create forests that are more resilient to the impacts of climate change.

MANGROVES

Diverse group of salt-tolerant plant communities found in the (tropical/subtropical) coastal intertidal zone

CHARACTERISTICS

- Survive under hostile environments (high salt, low oxygen)
- Their roots (pneumatophores) absorb oxygen from atmosphere
- Thick succulent leaves to store fresh water

MANGROVE COVER

- Global: Asia > Africa > North and Central America > S America
- India (ISFR 2021): West Bengal > Gujarat > A&N Islands > Andhra Pradesh > Maharashtra

Sunderbans - World's largest single patch of Mangrove forests

SIGNIFICANCE

- Stabilise the coastline and reduce soil erosion
- Protection against cyclones
- Improve water quality by absorbing nutrients
- Important carbon sink

THREATS

- Commercialisation of coastal areas
- Emergence of shrimp farms
- Temperature fluctuations (Mangroves can't survive freezing temperatures)

CONSERVATION MEASURES

Global

- Inclusion of Mangroves in Biosphere Reserves and UNESCO Global Geoparks
- Mangroves for the Future Initiative (IUCN & UNDP)
- Mangrove Alliance for Climate (UNFCCC COP27)

India

- National Mangrove Committee (1976)
- Mangrove Initiative for Shoreline Habitats & Tangible Incomes (MISHTI) (Union Budget 2023-24)



Drishti Mains Question:

Q. Discuss the critical importance of mangrove conservation for India's coastal ecology and economy. Suggest a multi-pronged approach for effective mangrove ecosystem management.

UPSC Civil Services Examination Previous Year Question (PYQ)

Prelims

Q. Which one of the following regions of India has a combination of mangrove forest, evergreen forest and deciduous forest? (2015)

- (a) North Coastal Andhra Pradesh
- (b) South-West Bengal
- (c) Southern Saurashtra
- (d) Andaman and Nicobar Islands

Ans: (d)

Mains

Q. Discuss the causes of depletion of mangroves and explain their importance in maintaining coastal ecology. **(2019)**

PDF Refernece URL: <https://www.drishtias.com/printpdf/iucn-report-on-mangrove-ecosystems>

