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?

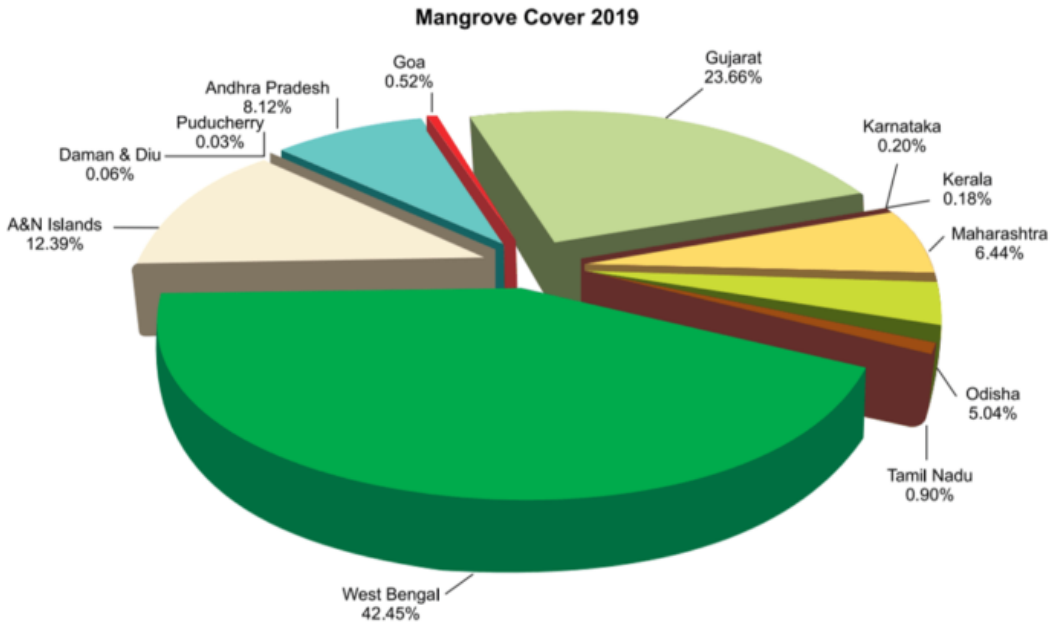
- **About:** This study classified the world's mangrove ecosystems in **36 different regions** called provinces and assessed the threats and risk of collapse in each region.
- **Findings:**
  - **More than Half of the Worlds Margrove Under Risk:**
    - Over **50%** of the world's mangrove ecosystems 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.

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)**