Role of Mangroves in averting Climate Change

Why in news?

Recently, India has joined the Mangrove Alliance for Climate that was launched on the sidelines of the ongoing United Nations Climate Summit (COP27) in Egypt.

What are mangroves?

- Mangrove is a tropical tree thriving near the coastline in brackish water.
- Mangroves are salt tolerant trees, also called halophytes.
- They are adapted to the low oxygen (anoxic) conditions of waterlogged mud.
- These trees cannot survive in colder temperatures.
- They have tangled prop roots that allow the trees to survive the daily tides and capture sediments while slowing waterflow.

How do mangroves help in mitigating climate change effects?

> *As per the 2022 State of World's Mangroves Report prepared by the Global Mangrove Alliance, mangroves prevent more than 65 billion dollars in property damages and reduce flood risk to some 15 million people every year.*

Carbon sinks

- **Net zero carbon emissions -** Since mangroves store carbon from the atmosphere at up to 4 times the rate of terrestrial forests, they are indispensable in achieving the goal of net zero carbon emissions.
- **Soil carbon accumulation**- Dead mangroves decompose very slowly due to waterlogging in the soil, making the soil carbon accumulation last for hundreds of years.
- Indonesia, Brazil, Nigeria, Australia and Mexico hold 50% of the total world mangrove carbon, mainly due to their large mangrove areas.

Ecosystem services

- Mangroves support interconnected terrestrial, freshwater, and marine habitats.
- **Capture sediments** - The roots of mangrove trees capture sediments, resulting in the formation of new, fertile lands.
- **Aquatic life** - While mangrove creeks provide safe grounds for young fish, they simultaneously provide rich feeding areas for predatory fish.

Disaster risk reduction

- **Coastal protection** - Mangroves stabilise coastlines by holding sediments together.
- They also act as safety nets against storms and surges.
- In tropical coastal areas, mangroves are the first line of defence against natural disasters like cyclones and hurricanes that originate in seas and oceans and impact land.
- **Prevents erosion** - Mangrove trees act as a buffer zone and arrest winds, slowing them down and hence minimising impact on land.

Socio-economic importance

- **Economic and food security** - Mangrove ecosystems are home to a variety of fish thus providing a critical source of jobs and protein to local, coastal communities.
- **Source of revenue** - Mangroves are also important resources for timber and fuelwood, when collected sustainably.
- **Promotes biodiversity** - Mangroves are extremely rich in biodiversity housing several threatened or endangered species.
    - In India, mangroves found in the Sunderbans shelters the Royal Bengal Tiger, fishing cats, macaques, leopard cats, wild boar, flying fox, pangolin, and Indian grey mongoose.
- **Promotes tourism** - The biodiversity hotspot attracts thousands of visitors every year, generating valuable revenue.

What are the major threats to mangroves?

- **Key threats** - Some of the glaring threats to mangrove forests include
    - Agriculture
    - Overfishing
    - Rapid urbanization
    - Change in sedimentation rates and patterns
    - Rising sea levels
    - Increase in pollutants
    - Deforestation
- **Kenya** - Overreliance on mangroves for fuel, pollution from land-based sources, and conversion of mangrove areas to other land uses such as salt mining or settlements pose serious threats to mangroves.
- **Madagascar** - Deforestation for fuel is the biggest threat to mangroves.
- **Mozambique** - More than 6% of mangrove cover is lost in the last 20 years, mainly due to the extraction of wood resources and deforestation to create land for saltpans and urban settlements.
- Solar salt production, which involves clearing and selective logging, altering microhabitats and microclimates, is also an important threat.
- **India** - Salinisation, population pressure, and overexploitation are the primary threats.
- The Sunderbans is sandwiched between a densely populated, poor rural area and a rising sea (climatic and demographic challenges) thus contributing to the degradation of the biodiversity hotspot.

Quick facts

Mangrove Alliance for Climate (MAC)

- Mangrove Alliance for Climate (MAC) is an intergovernmental alliance that works on a voluntary basis for planting, conserving and restoring mangroves.
- **Members** - MAC is led by the United Arab Emirates (UAE) and Indonesia and includes India, Sri Lanka, Australia, Japan, and Spain.
- **Aim** - To educate and spread awareness worldwide on the role of mangroves in curbing global warming and its potential as a solution for climate change.

India and Mangroves

- Mangroves cover 4,992 sq km or 0.15% of India's total area.
- **Sundarbans** is the world's largest mangrove ecosystem in the world.
- The highest percentage of mangrove cover in India - West Bengal, Gujarat and Andaman and Nicobar islands.
- The mangroves have been afforded protection under **Category I** of the CRZ (Coastal Zone Regulation 1991).

References

1. The Hindu | How mangroves help in averting climate change risks
2. Global Mangrove Alliance | India's biennial State of Forest Report

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