Mains Practice Question

Q. Highlight the significant role played by coral reefs in maintaining ocean ecosystems. Discuss the impact of climate change on corals. (150 words)

28 Nov, 2022 GS Paper 1 Geography

Approach

- Start your answer by briefly describing coral reefs.
- Discuss their significant role in sustaining ocean ecosystem.
- Discuss the impact of climate change on corals.
- Conclude accordingly.

Introduction

- Corals are marine invertebrates or animals which do not possess a spine. They form the largest living structures on the planet.
- Each coral is called a polyp and thousands of such polyps live together to form a colony, which grow when polyps multiply to make copies of themselves.

Body

- **Significance of corals in maintaining ocean ecosystem:**
    - Coral reefs are described as the tropical forests of the ocean, or as ocean oases.
    - They support over 25% of marine biodiversity even though they take up only 1% of the seafloor.
    - Coral reefs are some of the most diverse and valuable ecosystems on Earth.
    - **About one quarter of the 500,000 animal species living in the world's oceans inhabit the areas with coral reefs.** Further, they support more **species per unit area than any other marine environment,** including about 4,000 species of fish, 800 species of hard corals and hundreds of other species.
    - When reefs are damaged or destroyed, the absence of this natural barrier can increase the damage to coastal communities from normal wave action and violent storms.
    - Coral reef structures also buffer shorelines against 97% of the energy from waves, storms, and floods, helping to prevent loss of life, property damage, and erosion.
- **Impact of climate change on corals:**
    - Climate change infers ocean change, further, increased greenhouse gases from human activities result in climate change and ocean acidification. The world's ocean is a massive sink that absorbs carbon dioxide (CO_2). Although this has slowed global warming, it is also changing ocean chemistry.
    - Despite their great economic and recreational value, coral reefs are severely threatened by pollution, disease, and habitat destruction. Once coral reefs are damaged, they are less able to support the many creatures that inhabit them and the communities near them. The various other impact on corals are as follows:
        - **A warming ocean:** It causes thermal stress that contributes to coral bleaching and infectious disease.
        - **Sea level rise:** It may lead to increases in sedimentation for reefs located near

land-based sources of sediment. Sedimentation runoff can lead to the smothering of coral.

- **Changes in storm patterns:** leads to stronger and more frequent storms that can cause the destruction of coral reefs.
- **Changes in precipitation:** Increased runoff of freshwater, sediment, and land-based pollutants contribute to algal blooms and cause murky water conditions that reduce light.
- **Altered ocean currents:** It leads to changes in connectivity and temperature regimes that contribute to lack of food for corals and hampers dispersal of coral larvae.
- **Ocean acidification (a result of increased CO_2):** It causes a reduction in pH levels which decreases coral growth and structural integrity.

Conclusion

Nonetheless, climate change is a pressing challenge for our entire ocean system, but it is also an opportunity for us to innovate and adapt. We must work together to become climate-smart citizens, state, country, world and support the necessary technical policy as well as investment solutions that our marine life and ocean ecosystem need then never before.