

General Studies-1; Topic – Geographical features and their location- changes in critical geographical features (including water bodies and ice-caps) and in flora and fauna and the effects of such changes.

Coral Bleaching

1) Introduction

- The corals ---- Charles Darwin defined them as “oasis in the desert of the ocean”.
- Corals typically live in compact colonies of many identical individual polyps.
- Corals species include the important reef builders that inhabit tropical oceans and secrete calcium carbonate to form a hard skeleton.

2) What is Coral Bleaching?

- When corals are stressed by changes in conditions such as temperature, light, or nutrients, they expel the symbiotic algae living in their tissues, causing them to turn completely white. This is called coral bleaching.
- The symbiotic algae called zooxanthellae, are photosynthetic and provide the coral with food in return for protection.
- When a coral bleaches, it is not dead.
- If the stress-caused bleaching is not severe, coral have been known to recover.
- If the algae loss is prolonged and the stress continues, coral eventually dies.
- Coral reefs are on decline due to overfishing, pollution fuelled by climate change.
- The death of coral reefs would result in the loss of a number of marine animals that rely on the reef for survival.
- Coral bleaching has occurred in the Caribbean, Indian, and Pacific oceans on a regular basis.

3) Present Status

- In the last two decades, corals have been dying due to bleaching.
- This has been happening due to increased ocean temperature, excessive surface runoff, overfishing, and oil spills or natural phenomenon like El Nino.
- 10% of the Earth’s coral reefs have been reduced to skeletons, another 30% are in a critical condition and a further 30 are under severe environmental stress.
- Great Barrier Reef in Australia’s eastern coast experienced an unprecedented second straight year of mass coral bleaching in 2017.
- Preliminary assessments indicate that the Indian Ocean is the most severely impacted region.
- More than 70% mortality has been observed off the coasts of Kenya, the Maldives, the Andaman and the Lakshadweep islands.
- It is said that corals are one of the first ecosystems to be affected by global warming.
- Vulnerability to reef loss, is particularly high in small island states.

4) Corals Benefits

- Despite occupying only 0.1% of the ocean’s area, coral reefs support about one-fourth of marine species in the world.
- Over 500 million people around the world rely on coral reefs for food security, economic well-being, and cultural identity.

- Goods and services—like tourism and fishing—derived from coral reefs have an estimated value of US\$375 billion a year.
- They are critical for protecting coastal communities from wave action, erosion, and tropical storms.
- Corals are very important in controlling how much carbon dioxide is in the ocean water.
- They support more species per unit area than any other marine environment.
- They also protect the highly productive wetlands as well as ports and harbours and the economies they support.
- Corals also hold prospects as medicinal value for humans.

5) **Recent IPCC Report on Coral Reefs**

- Recently IPCC released its landmark report on climate change.
- One of the most striking claims by the IPCC report is about the loss of coral reefs.
- Coral reefs would decline by 70-90 percent with global warming of 1.5°C, whereas virtually all (> 99 percent) would be lost with 2°C.

6) **Way Forward**

- The world needs coral reefs, and decisive action will help ensure that we do not face a future without them.
- Adequate mitigation and adaptation measures must be put in place to arrest the effects of climate change
- We must devise policies to provide protection to existing carbon sinks such as corals.
- Reducing greenhouse emissions will be critical here.
- Effectively reducing local stresses to reefs, such as from land-based sources of pollution and overfishing.
- Increasing electricity generation from the renewable sources rather than depend on the artificial removal of carbon dioxide from the atmosphere.
- Conserving water. The less it is used, the less runoff and wastewater that will eventually find its way back into the ocean.
- Educating people about why healthy coral reefs are valuable to the people, fish, plants, and animals that depend on them.