Coral Reefs

GS-Paper-1 Geography (PT-MAINS)

A coral reef is an **underwater ecosystem** characterized by reef-building corals. Reefs are formed of colonies of coral polyps held together by **calcium carbonate**. Most coral reefs are built from stony corals, whose polyps cluster in groups.

- Coral belongs to the class Anthozoa in the animal phylum Cnidaria, which includes sea anemones and jellyfish.
- Unlike sea anemones, corals secrete hard carbonate exoskeletons that support and protect the coral.
- **Most reefs grow best in warm, shallow, clear, sunny and agitated water.**
- Sometimes called rainforests of the sea, shallow coral reefs form some of **Earth’s most diverse ecosystems**.
- They are most commonly found at shallow depths in tropical waters, but deep water and cold water coral reefs exist on smaller scales in other areas.
- Coral reefs deliver ecosystem services for tourism, fisheries and shoreline protection.
- Coral reefs are fragile, partly because they are sensitive to water conditions.
- They are under threat from **excess nutrients** (nitrogen and phosphorus), rising temperatures, oceanic acidification, overfishing (e.g., from blast fishing, cyanide fishing, spearfishing on scuba), sunscreen use, and harmful land-use practices, including runoff and seeps (e.g., from injection wells and cesspools)(PT).

The distribution of coral reefs in India

Recovery of Coral reefs

The **Gulf of Mannar (GoM)**, spread around 21 islands, suffers significant damage caused by livelihood-linked human threats and climate change. **The islands and the reef areas collectively constitute the Gulf of Mannar Marine National Park (GMMNP).**

- Corals in the GoM usually bleach in summer if the **water temperature surpasses 30°C**, but they **recover when it drops in August**.
- According to recent study, Cyclones Amphan and Nisarga that unleashed destruction in eastern and western India have saved the Gulf of Mannar corals from mass bleeding as windstorms along with two low pressures have significantly lowered seawater temperature in summer.
- As the water temperature level reached 31.8°C in April, partial coral bleaching [less than 5%] was observed.
- The high temperature levels persisted till May [the highest level being 31.9°C], when widespread bleaching was witnessed.
- **Average bleaching prevalence this summer is 28.20%**. Shallow areas [0.5 and 2m deep] have a bleaching prevalence of 21.20%, while deep regions [2 and 6m] have only 7%.
- Thoothukudi group islands have the highest bleaching prevalence (30.80%), followed by Mandapam and Keelakarai groups.
- The brief coral bleaching event is almost over, and corals have already started recovering.
- The water temperature dropped [28.6°C] in early June, which has helped corals restore
their zooxanthellae.

- It is expected that the bleached corals will completely recover by July-end without facing any mortality, provided the present climatic condition continues.
- Reduction in sewage inflow, industrial and human activities and halt in fishing during the lockdown have also assisted in improvement of reef health, resulting in enhanced fish population and faster coral recovery.