Recovery of Coral Reefs in Great Barrier Reef

For Prelims: Great Barrier Reef (GBR), Corals, Acropora corals, Coral bleaching.

For Mains: Significance of Coral Reefs in Marine Ecosystem.

Why in News?

According to the **Australian Institute of Marine Science's (AIMS)** annual long-term monitoring report, Australia's northern and central **Great Barrier Reef (GBR)** has experienced high levels of coral reef cover over the past 36 years.

- The researchers also warned that the gains could be quickly reversed due to rising global temperatures.

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What are the Key highlights of Report?

- **Quick Recovery:**
  - It states that **reef systems are resilient and capable of recovering after disturbances** such as accumulated heat stress, **cyclones**, predatory attacks.
  - It shows record levels of **region-wide coral cover in the northern and central GBR since the first ever Australian Institute of Marine Science (AIMS) survey was done.**
    - Coral cover is measured by determining the increase in the cover of hard corals.
- **Growth in Central & Northern:**
  - The hard coral cover in northern Great Barrier Reef had reached 36% while that in the central region had reached 33%.
  - Meanwhile, coral cover levels declined in the southern region from 38% in 2021 to 34% in 2022.
- **Dominated by Acropora corals:**
  - The high level of recovery is fueled by the increase in the fast-growing **Acropora corals**, which are a dominant type in the Great Barrier Reef.
  - Incidentally, these fast-growing corals are also the most susceptible to environmental pressures such as rising temperatures, cyclones, pollution, crown-of-thorn starfish (COTs) attacks which prey on hard corals and so on.
- **Less Natural Calamities:**
  - Also, behind the recent recovery in parts of the reef, are the low levels of acute stressors in the past 12 months — no tropical cyclones, lesser heat stress in 2020 and 2022 as opposed to 2016 and 2017, and a decrease in COTs outbreaks.

What are the Issues Highlighted by the Report?

- **Climate change:**
  - The biggest threat to the health of the reef is **climate change**-induced heat stress, resulting in coral bleaching.
  - Despite several global initiatives sea temperatures are predicted to increase by 1.5°C to 2°C by the time the century nears its end.
  - According to the United Nations assessment in 2021, the world is going to experience heating at 1.5°C in the next decade, **the temperature at which bleaching becomes more frequent and recovery less impactful.**
- **Frequent Mass bleaching**:
  - In recent times mass bleaching events have become more frequent.
  - **The first mass bleaching event occurred in 1998 when the El Niño weather pattern caused sea surfaces to heat, causing 8% of the world's coral to die**.
  - The second event took place in 2002. But the longest and most damaging bleaching event took place from 2014 to 2017.
  - The aerial surveys by AIMS included 47 reefs and coral bleaching was recorded on 45 of these reefs.
    - While the levels were not high enough to cause coral death it did leave sub-lethal effects such as reduced growth and reproduction.

What are Coral Reefs?

- **About:**
  - **Corals** are marine invertebrates or animals which **do not possess a spine.**
  - They are 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.**
  - Further, they are of **two types:**
    - **Hard corals:**
      - They extract calcium carbonate from seawater to build hard, white coral exoskeletons.
        - They are in a way the **engineers of reef ecosystems** and measuring the extent of hard coral is a widely-accepted metric for measuring the condition of coral reefs.
    - **Soft corals:**
      - They attach themselves to such skeletons and older skeletons built by their ancestors.
        - Soft corals also add their own skeletons to the hard structure over the years.
          - These growing multiplying structures gradually form coral reefs.
- **Significance:**
  - They support over 25% of marine biodiversity even though they take up only 1% of the seafloor.
  - The marine life supported by reefs further fuels global fishing industries.
    - Besides, coral reef systems generate USD 2.7 trillion in annual economic value through goods and service trade and tourism.

What is Australia's Great Barrier Reef?

- **About:**
  - It is the world's largest reef system stretching across 2,300 km and having nearly 3,000 individual reefs.
  - Further, it hosts 400 different types of coral, gives shelter to 1,500 species of fish and 4,000 types of mollusc.
- **Significance:**
  - In pre-**Covid-19** times, the Reef generated USD 4.6 billion annually through tourism and

employed over 60,000 people including divers and guides.

Way Forward

- With estimates that coral reefs are among the most threatened ecosystems on Earth, there is a dire need for societal-level changes to reduce human impacts on coral reef ecosystems is no longer a debate.
- The achievement of **Sustainable Development Goals**(SDG 14) by 2030 could help improve ocean resources, to be sure.
    - Actions that protect top predators, identify key herbivorous fish species for protection, halt destructive fishing, boating and diving, and manage exploitation of reef fish cannot hurt.
        - Nevertheless, much more **aggressive action and education from the top down to grassroots efforts to achieve a carbon-neutral planet are required to protect coral reefs.**

UPSC Civil Services Examination Previous Year Question (PYQ)

Prelims

Q. Which of the following have coral reefs? (2014)

1. Andaman and Nicobar Islands
2. Gulf of Kachchh
3. Gulf of Mannar
4. Sunderbans

Select the correct answer using the code given below:

(a) 1, 2 and 3 only
(b) 2 and 4 only
(c) 1 and 3 only
(d) 1, 2, 3 and 4

Ans: (a)

Exp:

- India with its coastline extending over 7,500 kilometres and subtropical climatic conditions has very few coral reef areas.
- **The major coral reef formations in India are,**
    - **Gulf of Mannar, hence, 3 is correct.**
    - **Palk Bay,**
    - **Gulf of Kuchchh, hence, 2 is correct.**
    - **Andaman and Nicobar Islands, hence, 1 is correct.**
    - **Lakshadweep Islands.**
- While the Lakshadweep reefs are atolls, all the others are fringing reefs. Patchy coral is present in the intertidal areas of the central west coast of the country.
- Coral reefs require clean and clear water, warm surface water and sunlight to survive. Since, most of these requirements are not met in Sunderbans region, coral reefs are not found here. Other disadvantage to reef growth are the heavy monsoonal rains and the high human presence on the coastline. Hence, 4 is not correct. **Therefore, option (a) is the correct answer.**

Mains

Q. Assess the impact of global warming on the coral life system with examples **(2019)**

Source: TH