

Researchers dive in to restore coral ecosystems



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The group has successfully transplanted corals in the Lakshadweep region.

Coral reefs are among the most diverse ecosystems on earth, and their role in maintaining marine biodiversity is of no small measure.

However, it is well documented that coral systems around the world are bleaching and dying due to climate and chemical changes in the sea water. A team from National Centre for Coastal Research, Chennai, plans to work on coral monitoring and restoration in the Gulf of Mannar region. “We assess the location and coverage of corals through remote sensing, then study how the sediment affects

the coral reef,” says T Shunmugaraj, who leads this project along with M V Ramanamurthy, Director, NCCR. The team will also set up an aquaculture park which will help local persons rear marine ornamental fish towards a sustainable livelihood.

The group has prior experience in studying corals across the country. They have successfully transplanted and nurtured corals in the Lakshadweep region. Now they are set to work in the Gulf of Mannar.

Coral bleaching

Corals have a symbiotic relationship with the unicellular algae dinoflagellates. An increase in sea surface temperatures leads to coral bleaching and the breaking of this relationship. This ecosystem is so sensitive that an increase of sea surface temperature by one degree can cause the corals to bleach and die. Apart from sea surface temperatures, increase in carbon dioxide levels in the sea water and a change in its chemical composition can also trigger bleaching.

Not all corals are equally sensitive. The most susceptible are the branching corals, for example, *Acropora* species, and the least susceptible are the massive ones, for example *Favia* species.

Coral reefs in India are only seen in some localities around the Gulf of Mannar, Gulf of Kutch, Lakshadweep islands and Andaman and Nicobar islands. In many of these places, bleaching of corals and related cnidaria species such as giant clam and tentacle sea anemone have been observed by the team.

However, constructive interventions exist for this problem. The methods include reducing harvest of herbivorous fish and minimising anthropogenic causes of bleaching.

The National Centre for Coastal Research, which comes under the Ministry of Earth Sciences, conducted a mapping of corals for Gulf of Kutch, Gulf of Mannar, Lakshadweep and Andaman and Nicobar islands over a period of five years, from 2000 to 2005. Their results were startling, as they found less than 40% of the coral reefs in India were still alive.

From 2005 to present, the team, with support from Department of Science and Technology, has surveyed the area around Agatti and Kavaratti islands in the Lakshadweep, and in an area approximately one acre, transplanted branching corals, massive corals and foliac corals. “We take a small polyp, tie it to an iron frame and take it underwater. The iron frame is needed because if you place it directly, sediments will fall on them,” explains Dr. Shunmugaraj.

Restoration efforts

Over the last decade, this region has seen restoration of live corals in these areas. The team found that the branching coral *Acropora* could grow 25 cm in 3 years. Another genera, *Pocillopora*, grew 15 cm in 3 years.

The researchers plan to replicate the model in the Gulf of Mannar region, and towards this end, they have set up a centre in a 25-acre piece of land near the Rameshwaram coast. Partnering with Gulf of Mannar Marine National Park Authority, they will first monitor the 21 islands in this region and identify degraded areas.

In January, after the monsoons, they plan to start transplantation work with branching coral species.