

GOVERNMENT OF INDIA
MINISTRY OF ENVIRONMENT, FOREST AND CLIMATE CHANGE

LOK SABHA
UNSTARRED QUESTION NO. 3414
TO BE ANSWERED ON 16.12.2024

Coral Bleaching

3414. SHRI MUHAMMED HAMDULLAH SAYEED

Will the Minister of ENVIRONMENT, FOREST AND CLIMATE CHANGE be pleased to state:

- (a) whether the Government is aware of the recent widespread coral bleaching in Union Territory of Lakshadweep as reported by the ICAR Central Marine Fisheries Research Institute;
- (b) if so, the steps being taken to monitor, manage and mitigate the effects of marine heat waves and coral bleaching, and if any emergency response measures are in place to protect vulnerable marine eco-system, if so, the details thereof;
- (c) whether the Government is working on long term strategies to address sea level rise and climate-induced heat stress, in Lakshadweep; and
- (d) if so, the details thereof?

ANSWER

MINISTER OF STATE IN THE MINISTRY OF ENVIRONMENT, FOREST AND CLIMATE CHANGE
(SHRI KIRTI VARDHAN SINGH)

(a) & (b): Indian Council of Agriculture Research - Central Marine Fisheries Research Institute (ICAR-CMFRI) has reported widespread coral bleaching in Lakshadweep.

The Fourth Global Coral Bleaching Event (GCBE4) reported to occur during period, beginning of 2023 till mid May 2024, has affected the coral reef in Lakshadweep. As informed by Department of Environment & Forest, Lakshadweep Administration, three islands namely Kadmat, Kavaratti and Kiltan has experienced about 98% of coral bleaching during GCBE4.

Coral mass bleaching is a natural phenomenon across the global waters due to increase in Sea Surface Temperature (SST). Corals have great resilience power to recover to some extent depending upon the restoration of the normal sea condition. Since it is a global phenomenon, various strategies are adopted depending on local conditions to reduce climate change impacts.

Indian National Centre for Ocean Information Services (INCOIS) - a scientific & research organisation under Ministry of Earth Sciences (MoES) INCOIS provides operational services including monitoring of sea surface temperatures (SSTs), marine heatwave events and other oceanic variables. By utilizing satellite data, buoys, and oceanographic models, INCOIS identifies anomalies and disseminates Marine Heatwave Alerts to coastal states and relevant stakeholders. These alerts highlight coral regions impacted by bleaching due to thermal stress. INCOIS also routinely inform the distribution and hotspots of marine heatwaves in the Indian

Ocean. These assessments include their potential impact on ecosystems such as coral reefs. This information supports experts in understanding the implications for various marine ecosystems and mariculture activities. Further, INCOIS has collaborated with academic institutions and conducted detailed studies on the spatiotemporal variability of environmental parameters and their impact on the coral ecosystems of the Lakshadweep Islands.

Zoological Survey of India (ZSI) monitors coral reefs through coral restoration, coral transplantation, research on the reproductive biology of scleractinian corals, and studies of bleaching-resistant corals and zooxanthellae. The study includes assessment of scope and consequences of coral bleaching incidents. ZSI has recorded the significant effects of bleaching on hard coral species within Indian waters through extensive surveys, research, and Geographic Information System (GIS) mapping. ZSI comprehend the resilience of various coral species and provides critical insights for the formulation of effective conservation strategies and timely interventions by utilizing advanced climatic modelling techniques. ZSI is working in collaborations with state agencies to oversee the health of coral reefs in all the reef areas of India.

ICAR-CMFRI actively undertakes studies to understand the ecological changes affecting coral reefs and has a comprehensive national project aimed at investigating the resilience potential of various coral reefs in India

Coral Reef Health Report Card of Kadmat Island of Lakshadweep has been prepared by National Centre for Sustainable Coastal Management, Chennai which provides comprehensive assessment of health of coral reefs.

Department of Environment & Forest of Lakshadweep Administration monitors the health and resilience of corals in collaboration with ZSI and is working on Coral Transplantation activities at Kavaratti Lagoon enhanced coral reef cover and bio-diversity in the shallow reefs.

The Coral Reef Monitoring Robot (C-Bot), developed by the Council of Scientific & Industrial Research (CSIR) - National Institute of Oceanography (NIO), is employed to gather precise data regarding coral ecosystems. This robot features underwater imaging and geo-referencing capabilities, which are vital for continuous monitoring and validation of satellite data, thereby ensuring accurate evaluations of reef health.

(c) & (d): The sea level rise and climate induced heat stress are global phenomenon. The measures taken by Government to safeguard from the impact of sea level rise and climate induced heat stress are as follow:

1. Important regulatory provision includes:

- The Island Coastal Regulation Zone (ICRZ) notification of 2019 under The Environment (Protection) Act, 1986, stipulated provisions to manage and regulate developmental activities in coastal areas. The Integrated Island Management Plan mandates a 20-meter No Development Zone (NDZ) from the high tide line (HTL) for all islands in Lakshadweep, which helps minimize the impact of human activities on coastal ecosystems, thereby reducing vulnerability to sea level rise.
- Corals and coral reefs are classified as Coastal Regulation Zone - IA area under the Coastal Regulation Zone Notification 2011 and 2019 promulgated under The Environment (Protection) Act, 1986. Coastal Regulation Zone (CRZ) notifications regulate human activities affecting coral reefs.

- The Wildlife (Protection) Act, 1972, provides legal protections for corals.
2. Government of India is implementing the National Action Plan on Climate Change (NAPCC), which provides the overarching framework for climate actions in close collaboration with the States/UTs on long-term strategies to address sea-level rise and climate induced stress. All State Governments and Union Territories (UTs) are encouraged to prepare their own State Action Plan on Climate Change (SAPCC) consistent with strategies of NAPCC. Thirty-four States and Union Territory (UTs), including Lakshadweep, have prepared their respective SAPCC.
 3. The Lakshadweep SAPCC inter-alia provides action plan including those for management of sea level rise and heat stress. Some of the activities included in their SAPCC are as follows:
 - Systematic, long-term monitoring of coastal erosion and shoreline changes;
 - Preparation or revision of the Integrated Coastal Zone Management Plan to promote conservation of ecosystems like sand dunes and mangroves while regulating unsustainable interventions.
 - Adoption of a mix of natural and physical methods for erosion control, such as creating a green coastal wall using indigenous vegetation;
 - Establishment of ring bunds or similar physical barriers wherever necessary;
 - Capacity building among local communities and staff on coastal protection strategies and enforcement of regulations.
 - Development of climate-resilient agronomic practices and crop diversification to ensure food and economic security.
 - Strategies to address heat stress in livestock and mitigate impacts on fish stocks affected by temperature variations.
 - Climate proofing of infrastructure and energy systems, ensuring resilience to extreme climatic conditions.
 - Education and awareness programs to promote sustainable resource management and heat adaptation strategies.
 - Incorporating climate risk assessments into disaster preparedness plans to reduce vulnerabilities related to extreme heat events.
 - Lakshadweep administration is making investments in Coral Transplantation to restore damaged reefs through the transplantation of heat-resistant coral species, artificial reef installation to promote coral growth and create habitats for marine organisms, and expansion of Marine Protected Areas (MPAs) to safeguard biodiversity and mitigate overfishing to avoid any compromise to the integrity of reef ecosystems.
