

**GOVERNMENT OF INDIA
MINISTRY OF EARTH SCIENCES
LOK SABHA
UNSTARRED QUESTION NO. 4074
TO BE ANSWERED ON WEDNESDAY, 12TH AUGUST 2026**

COASTAL VULNERABILITY ASSESSMENT AND MONITORING

4074. SHRI. TANGELLA UDAY SRINIVAS:

Will the Minister of EARTH SCIENCES be pleased to state:

- (a) whether the Government has undertaken any assessment of coastal areas vulnerable to sea-level rise, coastal erosion and other climate-induced hazards and if so, the details thereof including vulnerable stretches in Andhra Pradesh;
- (b) the details of projects, studies and monitoring initiatives undertaken during the last five years for the assessment and forecasting of coastal hazards along with the funds allocated, sanctioned and utilised thereunder, State-wise including Andhra Pradesh;
- (c) whether any coastal districts or stretches in Andhra Pradesh have been identified for priority scientific assessment, monitoring or intervention support and if so, the details thereof; and
- (d) whether the Government has developed coastal vulnerability maps, prediction models or early warning systems to assist States in planning climate-resilient coastal management and if so, the details thereof?

ANSWER
THE MINISTER OF STATE (INDEPENDENT CHARGE) FOR
MINISTRY OF SCIENCE AND TECHNOLOGY
AND EARTH SCIENCES
(DR. JITENDRA SINGH)

- (a) Yes Sir. The Ministry of Earth Sciences has undertaken assessments of coastal areas vulnerable to sea-level rise, coastal erosion and other climate-induced hazards through its institutes, namely the National Centre for Coastal Research (NCCR) and the Indian National Centre for Ocean Information Services (INCOIS).

NCCR has carried out an updated assessment of shoreline changes along the Indian coast for the period 1990–2022 using multi-temporal satellite imagery, supported by field investigations and numerical modelling. The assessment indicates that 36.2% of the Indian coastline is eroding, 37.8% is stable, and 26.0% is accreting.

In addition, INCOIS has prepared Multi-Hazard Vulnerability Maps (MHVMs) for the entire Indian coastline, including the Andhra Pradesh coast, by integrating multiple coastal hazard parameters, such as sea-level change, shoreline change rate, elevation contours, and water levels, to delineate areas vulnerable to coastal inundation and oceanogenic hazards. An atlas of the Multi-Hazard Vulnerability Maps has also been released.

The assessment indicates that shoreline changes result from a combination of natural processes and anthropogenic interventions. Along the Andhra Pradesh coast, recurrent tropical cyclones, monsoon floods, sea-level rise and extreme events are the major drivers of coastal erosion, while ports, harbours and river damming contribute to shoreline changes. Further, based on the assessments, Prakasam, Krishna and Srikakulam districts have been identified as relatively more vulnerable to coastal hazards, while the coastal stretches of Yanam, Krishna, East Godavari, West Godavari and Guntur have been identified as relatively more vulnerable to multiple coastal hazards.

- (b) During the last five years, the National Centre for Coastal Research (NCCR) has undertaken major R&D studies under Prithvi Scheme on monitoring initiatives for coastal hazard assessment and forecasting. These include the Shoreline Change Atlas (1990–2022), the Bio-Physical Vulnerability Index (BPVI), the Coastal Inundation Risk Atlas etc by integrating shoreline change, geomorphology, coastal elevation, tidal range & wave characteristics to assess coastal vulnerability. These studies and monitoring initiatives have been undertaken as part of the ongoing programmes/projects of NCCR and an amount of Rs 182.4 Cr has been allocated for coastal research activities during the 15th Finance cycle.
- (c) Yes Sir. Based on the shoreline change assessment, the National Centre for Coastal Research (NCCR) has identified priority erosion hotspots along the Andhra Pradesh coast by considering continuous erosion stretches exceeding 1 km in length with shoreline retreat rates greater than 3.0 m/year. Further, based on the Bio-Physical Vulnerability Index (BPVI) assessment, Prakasam, Krishna and Srikakulam districts have been identified as relatively more vulnerable along the Andhra Pradesh coast and are being accorded priority for scientific assessment and monitoring. Further, NCCR has also prepared the Shoreline Management Plan (SMP) for Andhra Pradesh and two Detailed Project Reports (DPRs) for coastal protection works in Kakinada and Vishakhapatnam which have been submitted to the Government of Andhra Pradesh.
- (d) Yes Sir. The Ministry of Earth Sciences has developed coastal vulnerability maps, prediction models and early warning systems to support climate-resilient coastal management. The Indian National Centre for Ocean Information Services (INCOIS) has prepared the Multi-Hazard Vulnerability Maps (MHVM) Atlas at a scale of 1:25,000 covering the entire Indian coastline to support coastal planning and management. INCOIS has also developed and operationalised ocean and coastal forecasting and early warning systems, including those for tsunamis, storm surges, high waves and coastal inundation, to assist Central and State agencies in disaster preparedness and coastal zone management.

In addition, the National Centre for Coastal Research (NCCR) undertakes R&D on coastal processes and shoreline management, and provides scientific support to coastal States/UTs by identifying vulnerable stretches, recommending site-specific mitigation measures, and preparing Shoreline Management Plans (SMPs) on a request/need basis. Shoreline Management Plans have been prepared for the coasts of Andhra Pradesh, Tamil Nadu, Puducherry and Kerala and shared with the respective State Governments to support climate-resilient coastal management through shoreline protection and climate change adaptation measures.
