

**GOVERNMENT OF INDIA
MINISTRY OF EARTH SCIENCES
LOK SABHA
UNSTARRED QUESTION NO. 3767
TO BE ANSWERED ON WEDNESDAY, 18TH DECEMBER, 2024**

RISING SEA LEVELS IN ANDHRA PRADESH

3767. SHRI BASTIPATI NAGARAJU:

Will the Minister of EARTH SCIENCES be pleased to state:

- (a) the details of rising sea levels in the country during the last five years, State-wise;
- (b) whether the Government has undertaken any study to assess the States at risk due to rising sea levels in the country, especially Andhra Pradesh;
- (c) if so, the details thereof indicating the number of people likely to be affected and critical infrastructure at risk due to rising sea levels, especially in Andhra Pradesh, State-wise;
- (d) if not, the reasons therefor; and
- (e) whether the Government has plans to conduct a study on the impact of rising sea levels, if so, the details thereof including the proposed timeline for the same?

ANSWER

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

- (a) Sea level undergoes large variations year-to-year due to various seasonal/climatic factors. The sea level rise is a slow shift from its mean state and, hence, necessitates measurement over a much longer period, typically a period of at least 30 years. Therefore, 5-year period is not sufficient to measure the sea level rise. However, based on published scientific studies, the sea level in the Indian Ocean was observed to be rising at a rate of about 1.7 mm/year during the last century (1900–2000) and even more rapidly in the north Indian Ocean at the rate of about 3.3 mm/year since 1993-2015 (MoES Climate Assessment Report). Recent research suggests that the rate of sea level rise varies significantly across the Indian coasts. An assessment based on gridded satellite altimeter record (1993-2020) for a few selected locations along the Indian coast are given below:

Location	Trend (mm/yr)
Mumbai	4.59±0.19
Mormugao	4.30±0.17
Kochi	4.10±0.16
Chennai	4.31±0.26
Visakhapatnam	4.27±0.33
Paradip	4.43±0.36

- (b) Ministry has not undertaken any study to assess the direct impact due to rising sea levels especially at Andhra Pradesh coast. However, the Ministry of Environment, Forest and Climate Change under the Integrated Coastal Zone Management project (ICZMP) has demarcated the hazard line along the entire coastal belt and intertidal areas of the country including Andhra Pradesh. The hazard line is indicative of the shoreline changes, including the sea level rise due to climate change and is a projection of impact due to sea level rise, and shoreline changes over a long period of time viz. over 100 years. This line is to be used by the coastal state agencies concerned as a tool for Disaster Management for the Coastal environment, including planning of adaptive and mitigation measures.
- (c) Ministry of Earth Sciences, through NCCR, has prepared the Shoreline Management Plan to support the Government of Andhra Pradesh in addressing coastal erosion and supporting coastal infrastructure development activities. NCCR has been providing technical support in preparation of DPR, for submission to NDMA by Govt. of Andhra Pradesh as follows:
- SDSC-SHAR, Sriharikota - for mitigating coastal erosion and protecting strategic infrastructure of SHAR;
 - ONGC, Vodalarevu - for mitigating the erosion and protecting the strategic shorefront facilities of ONGC
 - Uppada, Kakinada - proposed an integrated coastal protection strategy for the Kakinada coast considering the eroding fishing villages and eco-sensitive areas like Coringa mangrove forests.
 - Visakhapatnam - Prepared an integrated coastal protection strategy for the Visakhapatnam Port to Bheemunipatnam area and submitted the DPR to NDMA in association with Visakhapatnam Metropolitan Region Development Authority (VMRDA).
 - Srikakulam – DPR to address the issues at confluence points of Nagavalli and Vamsadhara rivers and to support the local fishing community.

The implementation of the technical solutions and strategies is to be taken up by the State Government based on its priorities and resources while NCCR can provide all the technical support to Govt. of Andhra Pradesh in this regard.

- (d) Does not arise.
- (e) Ministry does not have any plans to conduct a study on the impact of rising sea levels. However, Indian National Centre for Ocean Information and Services (INCOIS), an autonomous institute under MoES has carried out the following studies by incorporating sea level change as one among many other parameters.
- (i) Coastal Vulnerability Index (CVI) maps at 1:100000 scale have been prepared based on the assessment of probable implications to the coast due to sea level rise, coastal slope, shoreline change rate, coastal elevation, coastal geomorphology, tidal range and significant wave height.

- (ii) INCOIS has also prepared the Multi-Hazard Vulnerability Maps (MHVM) for the mainland of India at 1:25000 scale. These maps were prepared based on the composites of extreme water levels recorded by the tide gauges and published literature, shoreline change rate estimated from satellite data, rate of sea level change and high-resolution topographic data (Airborne Lidar Terrain Mapping, and Digital Terrain Models derived from Cartosat-1 data). The MHVM indicates the probable areas of the coast that would get flooded due to oceanogenic disasters like tsunamis and storm surges in 100-year return periods.
- (iii) Further, NCCR, an attached office of MoES, under the shoreline mapping system, a report on "National Assessment of Shoreline Changes along Indian Coast" was released in July 2018 and the report was shared with various Central and State Government agencies and stakeholders including Andhra Pradesh for implementing shoreline protection measures. An updated version of Atlas, along with a digital version of the report, containing all the maps, was released on 25th March 2022.
