

GOVERNMENT OF INDIA  
MINISTRY OF ENVIRONMENT, FOREST AND CLIMATE CHANGE

**LOK SABHA**  
**UNSTARRED QUESTION NO. 3261**  
TO BE ANSWERED ON 13.03.2020

**Threat of Rising Sea Level**

3261. ADV. ADOOR PRAKASH:  
SHRI RAJESHBHAI CHUDASAMA:

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

- (a) whether the Government has taken note of the threat of rising sea levels in the coastal areas of the country and if so, the details thereof;
- (b) whether the Government has conducted any study on rising sea levels due to climate change and its impact on the coastal cities of the country;
- (c) if so the details thereof indicating the regions facing such challenges, State/UT-wise;
- (d) whether the Government has consulted climate change experts including academics and scientists to address the issue of rising sea-levels, if so, the details thereof and if not, the reasons therefor; and
- (e) the concrete steps taken by the Government to make coastal cities and their populations resilient to rising sea-levels?

**ANSWER**

**MINISTER OF STATE IN THE MINISTRY OF ENVIRONMENT, FOREST AND CLIMATE CHANGE  
(SHRI BABUL SUPRIYO)**

(a) Based on the study by Indian National Centre for Ocean Information Services (INCOIS) as well as the studies published in scientific literature, on an average, the sea level along the Indian coast is considered to be rising at about 1.7 mm/year. It was observed that, the sea levels are changing at different rates along the Indian coast. These rising sea levels alone may not impact much but, it can exacerbate the coastal inundation along low lying areas during the extreme events such as tsunami, storm surge, coastal flooding, coastal erosion. It will have cumulative impact on inundation during extreme events causing increased coastal inundation. The coastal areas that might get inundated due to the rising sea level needs to be evaluated based on the elevation of the coastal areas; that is the elevation of the coast above mean sea level.

(b) and (c) The direct impacts of sea level rise on coastal zones were not carried out. However, INCOIS has estimated rate of change in the sea levels from the long term data (monthly mean sea levels) obtained from the sea level gauges installed at 10 major ports which is given below. These rates may also include the manifestations in sea level due to the subsidence or uplift of land at those locations. Since no long term data on land subsidence or upliftment are available for those locations, the rate of increase of sea level due to the changes in climate could not be separated. For example, the higher rate of sea level increase

at Diamond Harbour is also due to the larger land subsidence happening there. The same may apply to Kandla, Haldia and Port Blair as well.

S. No.	Location	Rate of change of sea-level (mm/year)	Duration of data used (years)
1	Chennai	0.33	1916-2005
2	Diamond Harbour	5.16	1948-2005
3	Haldia	2.89	1972-2005
4	Kandla	3.18	1950-2005
5	Kochi	1.30	1939-2005
6	Mumbai	0.74	1878-2005
7	Paradeep	1.03	1966-2005
8	Port Blair	2.20	1916-1964
9	Vizag	0.97	1937-2005
10	Okha	1.5	1964-1991

(d) and (e) INCOIS had prepared the coastal vulnerability index for the entire coastline as part of Tsunami Early Warning System. Coastal Vulnerability Index (CVI) mapped at 1:100000 scale was prepared based on the assessment of probable implications to the coast due to sea level rise (climatic and momentary due to tsunami/storm surge), coastal slope, shoreline change rate, coastal elevation, coastal geomorphology, tidal range and significant wave height. These maps are available at <https://www.incois.gov.in/portal/cvi/index.html>. In addition, INCOIS has also prepared the Multi-Hazard Vulnerability Maps (MHVM) for mainland of India at 1:25000 scale. The MHVMs indicate the probable coastal flooding due to oceanogenic disasters like tsunami and storm surges. Both have used the Sea level change rate as one of the parameters. However, a detailed study is necessary to access coastal cities that have been projected as vulnerable to sea level rise and consequent submersion.

The experts and scientists from different organizations like Survey of India and the National Centre for Sustainable Coastal Management under Ministry of Environment, Forest and Climate Change (MoEFCC) have been involved to address the issue of rising sea levels.

With a view to conserve and protect the unique environment of the marine areas of the country and to promote development in a sustainable manner, the Central Government issued the Coastal Regulation Zone and Island Protection Zone notification which lays down strong emphasis on adaptation to impact of sea level rise. To enforce the provisions of the notification, the Government of India has constituted National Coastal Zone Management Authority and Coastal Zone Management Authorities for coastal States/Union Territories under Environment (Protection) Act, 1986 (EPA). Adequate powers under EPA have been provided to these Authorities to ensure implementation of the provisions of the notification. The notification also provides for constituting district level committees in each coastal district.

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