

**GOVERNMENT OF INDIA
EARTH SCIENCES
LOK SABHA**

UNSTARRED QUESTION NO:5030
ANSWERED ON:13.08.2014
COASTAL VULNERABILITY ASSESSMENT
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Will the Minister of EARTH SCIENCES be pleased to state:

- (a) whether the Government has undertaken any coastal vulnerability assessment to understand the impact of rise in sea levels due to global warming;
- (b) if so, the major findings of this assessment;
- (c) if not, the reasons therefor;
- (d) whether the Government proposes to take measures to protect the environment of coastal areas; and
- (e) if so, the details thereof including the steps taken by the Government in this regard and if not, the reasons therefor?

Answer

MINISTER FOR MINISTRY OF SCIENCE AND TECHNOLOGY AND MINISTRY OF EARTH SCIENCES (Independent Charge)(DR. JITENDRA SINGH)

(a) Yes Madam.

(b) Earth System Science Organization (ESSO) – Indian National Centre for Ocean Information Services (INCOIS), Hyderabad and ESSO-Integrated Coastal and Marine Area Management (ICMAM), Chennai have carried out mapping and demarcating of multi-hazard coastal vulnerability for the states. The relative vulnerability of different coastal environments is essentially quantified at a regional to national scale using basic information on seven risk variables, viz. shoreline change rate, sea-level change rate, coastal slope, mean significant wave height, mean tidal range, coastal regional elevation and coastal geomorphology. Most of the above parameters are dynamic in nature and require a large amount of data from different sources to be acquired, analysed and processed.

The general trend in the vulnerability, demarcated in to four classes (very high, high, medium and low), carried out first time on macro-synoptic scales (at 1:1,00,000) covering the entire Indian coastline suggest varied degrees of vulnerability along coastal states of Tamil Nadu, Andhra Pradesh, Odisha, Kerala, Maharastra, Goa, Gujarat and islands of Andaman and Nicobar Islands and Lakshadweep. The Gulfs of Kambhat and Kachchh in Gujarat show very high vulnerability indices, with the inlets of Kachchh showing localized vulnerability. Relatively low vulnerability indices are reported along the zones of Mangroves that help in breaking the large amplitude waves, dissipating the energy and hence act as a natural barrier. However, it is to be noted that coastal vulnerability aspects at a much local (micro) level are to be accounted with additional parameters such as cyclone, storm surge and coastal flooding so as to add an additional dimension to the current study.

Sea level rise is a very slow phenomenon and can be because of physical factors like normal subsidence, coastal erosion and siltation of river channels along the coastline apart from global warming. However, the trends of sea level rise as estimated to be 1.3mm/year along the Indian coasts during the last 40-50 years. However, longer term sea level data is required over the north Indian Ocean (Bay of Bengal, Arabian Sea etc.) to capture the signal of faster rising sea level.

On the global scale, Fifth Assessment Report (AR5) of Intergovernmental Panel on Climate Change (IPCC) suggests that global mean sea level has risen by 0.19 m over the period 1901-2010. The Report also suggests that sea level rise takes place in the background of several other physical factors like tsunami's, storm surges and tidal variations, swells, normal deltaic subsidence, coastal erosion and siltation of river channels along the coastline. ESSO-INCOIS and the Survey of India continuously monitor the sea level measurements all along the Indian coastline.

(c) Does not arise.

(d)-(e) Based on the recommendations of the expert committee report of the Prof M. S. Swaminathan, the Ministry of Environment and Forests (MoEF) is making efforts to implement an Integrated Coastal Zone Management (ICZM) Plan for India. Accordingly, the Central Government has issued CRZ-2011 notification with a view to ensure livelihood security to the fisher communities and other local communities, living in the coastal areas, to conserve and protect coastal stretches, its unique environment and its marine area and to promote development through sustainable manner based on scientific principles taking into account the dangers of natural hazards in the coastal areas, sea level rise due to global warming, does hereby, declare the coastal stretches of the country and the water area upto its territorial water limit, excluding the islands of Andaman and Nicobar and Lakshadweep and the marine areas

surrounding these islands up to its territorial limit, as CRZ and restricts the setting up and expansion of any industry, operations or processes and manufacture or handling or storage or disposal of hazardous substances as specified in the Hazardous Substances in the aforesaid CRZ.

The MoEF has initiated Integrated Coastal Zone Management Project by establishing a Society of Integrated Coastal Management (SICOM). Under the project, SICOM will be implementing the four components, namely, (i) National Coastal Management Programme; (ii) ICZM-West Bengal; (iii) ICZM-Orissa; (iv) ICZM-Gujarat. National component includes (a) Demarcation of hazard line for mapping the entire coastline of the mainland of the country; (b) A National Centre for Sustainable Coastal Management (NCSCM) has been established within the campus of Anna University, Chennai with its regional centres in each of the coastal States/Union territories to promote research and development in the area of coastal management including addressing issues of coastal communities.