

**GOVERNMENT OF INDIA  
MINISTRY OF EARTH SCIENCES  
LOK SABHA  
UNSTARRED QUESTION No. 985  
TO BE ANSWERED ON FEBRUARY 07, 2020**

**PROJECT TO STUDY AND PREDICT NATURAL DISASTERS**

**985. SHRI THIRUNAVUKKARASARASU:  
SHRI PRATHAP SIMHA:  
SHRI D.M. KATHIR ANAND:**

**Will the Minister of EARTH SCIENCES be pleased to state:**

- (a) whether the Government has initiated any project to study and predict cyclones, earthquakes and Tsunami occurring in the Indian Ocean and Bay of Bengal, well in advance;**
- (b) if so, the details thereof and if not, the reasons therefor;**
- (c) the steps taken/proposed to be taken by the Government to facilitate the search operations to find missing persons during the cyclones;**
- (d) the amount allocated during the last 5 years for the purpose; and**
- (e) whether any MoU has been signed with foreign countries in this regard and if so, the details thereof?**

**ANSWER  
MINISTER FOR MINISTRY OF SCIENCE AND TECHNOLOGY AND  
MINISTRY OF EARTH SCIENCES  
(DR. HARSH VARDHAN)**

**(a)&(b) Yes Sir.**

**India Meteorological Department (IMD) has initiated the following projects to improve monitoring and forecasting of Cyclones, Earthquakes and Tsunami:**

**Cyclone**

- Global Ensemble Forecasting System (GEFS) with a resolution of 23 km was adapted from National Centre for Environmental Prediction (NCEP), National Oceanic and Atmospheric Administration (NOAA), United States of America (USA). It has been upgraded to a resolution of 12 km to provide forecast upto 7 days from 1st June, 2018.**
- The Unified Model (UM) and Unified Model Ensemble Prediction System (UMEPS) have been adapted from UK Meteorological Office (UKMO), UK to provide forecast upto 7 days with 12 km resolution from 1st June, 2018.**

- **IMD also runs cyclone specific Hurricane Weather Research & Forecast (HWRF) Model adapted from NCEP, NOAA, USA with a resolution of 18 km, 6 km and 2 km for cyclone track and intensity prediction. A project has been undertaken to implement high resolution Ocean Atmospheric Coupled HWRF Model at IMD for cyclone forecasting.**

### **Earthquakes**

**To date, there is no proven scientific technique available, anywhere in the world, to predict the occurrence of earthquakes with reasonable degree of accuracy for location, time and magnitude. However, National Centre for Seismology (NCS), maintains a country-wide national seismological network, to detect and locate earthquakes occurring in and around the country. The earthquake input is disseminated to all the concerned stake holders including the State Disaster Management Authority. In addition data generated have been put to use for R & D on various aspects of Seismology.**

### **Tsunami**

**Early Warning Services for Tsunamis are being provided by Indian Tsunami Early Warning Centre (ITEWC) at Indian National Centre for Ocean Information Sciences (INCOIS), Hyderabad, an autonomous body under Ministry of Earth Sciences. ITEWC was established after the deadly Tsunami on 26 December, 2004 and has been operational since its establishment in October 2007. The ITEWC is capable of detecting tsunamigenic earthquakes occurring in the Indian Ocean as well as in the Global Oceans within 10 minutes of the occurrence of the earthquake and disseminates the advisories to the concerned authorities through email, fax, SMS, GTS and website. ITEWC is considered as one of the most modern tsunami warning centres in the world. Considering the performance of ITEWC, in October 2012, Intergovernmental Oceanographic Commission (IOC) of UNESCO has designated ITEWC as the Tsunami Service Provider (TSP) for the entire Indian Ocean Region. Since then, ITEWC is providing tsunami advisories and related services to 25 countries on the Indian Ocean rim.**

- (c) The responsibility of search and rescue operations during such natural calamities lies with the respective State Governments.**

**(d) Projects to study and predict cyclones, earthquakes and Tsunami are part of MoES's umbrella schemes Atmosphere and Climate Research, Observations Science & Services (ACROSS), Seismology and Geosciences Research (SAGE) and Ocean Services, Modelling Application Resources and Technology (OSMART) respectively. Total budget allocated to these schemes during the last 5 years are given in Annexure-I.**

**(e) A few notable initiatives with various research institutes and other leading agencies include the following:**

**With foreign countries**

➤ **Bilateral agreement with NOAA, USA and UK Met. Office for improvement in numerical weather prediction (NWP) modelling w.r.t. global forecast system and Unified Model (UM) respectively.**

➤ **With the support of World Meteorological Organisation (WMO) and Japan Meteorological Agency (JMA), an ensemble prediction system has been installed in IMD in 2011 for cyclone track prediction and prediction of location specific cyclone strike probability.**

➤ **A bilateral collaboration between India and United States involving National Centre for Environment Prediction (NCEP), USA, IMD, Indian National Centre for Ocean Information Services (INCOIS) and Indian Institute of Technology (IIT) Bhubaneswar has resulted in experimental implementation of high resolution Ocean Atmosphere Coupled Model viz. Hurricane Weather Research & Forecast (HWRF) Model for north Indian Ocean with resolution of 2, 6 and 18 km.**

**Annexure-I****(in Crores)**

<b>Schemes</b>	<b>2015-16</b>	<b>2016-17</b>	<b>2017-18</b>	<b>2018-19</b>	<b>2019-20</b>
<b>ACROSS</b>	<b>312.00</b>	<b>449.47</b>	<b>423.00</b>	<b>348.00</b>	<b>380.00</b>
<b>SAGE</b>	<b>131.50</b>	<b>60.01</b>	<b>88.82</b>	<b>96.00</b>	<b>130.00</b>
<b>OSMART</b>	<b>295.50</b>	<b>315.00</b>	<b>326.00</b>	<b>440.50</b>	<b>445.00</b>