

**GOVERNMENT OF INDIA  
MINISTRY OF EARTH SCIENCES  
LOK SABHA  
UNSTARRED QUESTION No. 19  
TO BE ANSWERED ON WEDNESDAY, FEBRUARY 24, 2016**

**MODERNISATION OF TECHNOLOGY**

**19. DR. SWAMI SAKSHIJI MAHARAJ:**

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

- (a) the details of funds allocated for modernisation of technology related with weather forecasting/study of ocean currents and forecasting of natural disasters during the last three years and the current year so far;**
- (b) the heads under which the said allocated funds spent;**
- (c) whether the Government has taken any steps for meaningful utilisation of the allocated funds;**
- (d) if so, the details thereof; and**
- (e) the role of National Centre of Medium Range Weather Forecasting (NCMRWF) in this project?**

**ANSWER**

**MINISTER OF STATE FOR MINISTRY OF SCIENCE AND TECHNOLOGY AND  
MINISTRY OF EARTH SCIENCES  
(SHRI Y. S. CHOWDARY)**

- (a) Funds allocated for modernisation of technology related with weather forecasting, study of ocean currents and forecasting of natural disasters during the last three years and the current year are as under:**

<b>Year</b>	<b>Funds allocated (Rs. in Crores)</b>	<b>Funds utilized (Rs. in Crores)</b>
<b>2012-13</b>	<b>213.50</b>	<b>148.94</b>
<b>2013-14</b>	<b>201.60</b>	<b>117.25</b>
<b>2014-15</b>	<b>198.67</b>	<b>108.67</b>
<b>2015-16</b>	<b>195.05</b>	<b>114.40</b>

- (b) Grants were spent for augmentation and sustenance various observing systems over land and ocean regions surrounding India for monitoring, detection and forecasting of weather and climate extremes including severe weather events such as cyclones, heavy rainfall, severe thunder storm, tsunami, coastal hazard etc. Funds for these purpose are allocated under the sub heads Atmosphere and Climate Research-Modeling Observing Systems and Services (ACROSS) and Ocean Services, Technology Observation and Resources Modeling and Science (O-STORMS) on year to year basis for successful implementation of various programmes.**

**(c)-(d) Yes Madam. Starting from XI five year plan, Government has initiated a comprehensive upgradation of (i) observation systems (ii) advanced data assimilation tools (iii) advanced communication and IT infrastructure (iv) high performance computing systems and (v) intensive/sophisticated training of Earth System Science Organisation-India Meteorological Department (ESSO- IMD) personnel to facilitate the implementation of advanced global/regional/ meso-scale prediction models for improving the accuracy of weather forecasts in all temporal and spatial scales and for quick dissemination of weather forecast assessments/warnings to the users.**

**The HPC systems during the XII<sup>th</sup> plan have been up-scaled to 1.2 petaflops so far to support the ongoing efforts so as to implement advanced Numerical Weather Prediction (NWP) models for weather, climate and ocean state forecasting. Operational implementation of improved forecast suite of models after the commissioning of the High Performance Computing (HPC) systems have enhanced the weather forecasting capacities through assimilating all available global satellite radiance data for the production of forecast products at 22km grid globally and 9km/3km grid over India/regional/mega city domains.**

**Further under the National Monsoon Mission initiative, the Indian Institute of Tropical Meteorology (ESSO-IITM), Pune, Indian National Centre for Ocean Information Services (ESSO-INCOIS), Hyderabad and National Centre for Medium Range Weather Forecasting (ESSO-NCMRWF), NOIDA have embarked upon to build a state-of-the-art coupled ocean atmospheric model for a) improved prediction of monsoon rainfall on extended range to seasonal time scale (16 days to one season) and b) improved prediction of temperature, rainfall and extreme weather events on short to medium range time scale (up to 15 days) so that forecast skill gets quantitatively improved further for operational services of ESSO-IMD.**

**(e) ESSO- NCMRWF is the lead modeling and data assimilation center of ministry of earth sciences, engaged in making use of the global observations from atmosphere, ocean and land to prepare initial conditions to make a weather/climate forecasts using advanced models and assimilation techniques. ESSO- NCMRWF has implemented an ensemble forecasting system to give probabilistic forecasts to users.**

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