

**GOVERNMENT OF INDIA
MINISTRY OF EARTH SCIENCES
LOK SABHA
UNSTARRED QUESTION No. 3105
TO BE ANSWERED ON FRIDAY, DECEMBER 06, 2019**

ACCURACY OF IMD FORECASTS

**3105. SHRI RAJU BISTA:
SHRI KANAKMAL KATARA:
SHRI PANKAJ CHAUDHARY :**

Will the Minister of EARTH SCIENCES be pleased to state:

- (a) the techniques being used by meteorologists for accurate weather forecasts including monsoon forecasts;**
- (b) whether the Government has taken note of the inaccurate forecasts of Indian Meteorological Department (IMD) including monsoon rainfall;**
- (c) if so, the details thereof and the reasons therefor;**
- (d) whether the Government has any proposal for accurate and localised weather forecasts for every region including upgradation of weather forecasting technology/instruments for more accurate forecasting of weather; and**
- (e) if so, the details thereof along with the steps taken by the Government in this regard?**

ANSWER

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

- (a) India Meteorological Department (IMD) uses scientifically based models for accurate weather forecasts including monsoon forecasts. IMD uses state-of-the-art mathematical models (prediction models) for generating forecasts on short to medium range (up to 10 days), extended range (10 days to 30 days) and seasonal forecasts (for the whole season). Ministry of Earth Sciences (MoES) has launched National Monsoon Mission (NMM) with a vision to develop state-of-the-art dynamical prediction system for the monsoon rainfall on different time scales.**

Under NMM, Indian Institute of Tropical Meteorology (IITM), Pune is coordinating and working along with different climate research centers from India and abroad on the development of a coupled atmosphere-ocean model for long and extended range forecasting of Indian summer monsoon rainfall.

For preparing the long range forecast for monsoon, currently, latest state-of-the-art statistical models and Monsoon Mission Climate Forecast System (MMCFS) model are used. IMD has been using MMCFS model for preparing operational forecasts since 2017 monsoon season along with present statistical models.

(b) & (c) For monsoon forecasts, IMD utilizes the products from the dynamical model developed under the National Monsoon Mission and a statistical model for generating Long Range Forecast (LRF) for Monsoon Season. With respect to LRF, the performance of the model for last three years gave mixed results.

The seasonal monsoon rainfall forecast issued by IMD using MMCFS for the past three years along with observed rainfall are given in the table below. However, the MMCFS model forecast correctly indicated the spatial distribution of rainfall over most of the region.

The verification of MMCFS monsoon rainfall forecast for the years 2017 to 2019								
2017			2018			2019		
Forecasted RF (% LPA)		Observed RF (% LPA)	Forecasted RF (% LPA)		Observed RF (% LPA)	Forecasted RF (% LPA)		Observed RF (% LPA)
Apr	Jun		Apr	May		Apr	May	
96± 5	100± 4	95	99± 5	102± 4	91	96± 5	96± 4	110

Forecast generated using MMCFS for monsoon season rainfall for the year 2017 was within the forecast limit. For 2018, the model forecast was overestimate and for 2019, it was underestimate with respect to the realized rainfall.

(d) & (e) It has been planned to further enhance the accuracy of weather forecasts and their effective & timely dissemination in the coming years. For this purpose, under the Umbrella Scheme 'Atmosphere & Climate Research - Modeling Observing Systems & Services (ACROSS)', there is a program, 'Upgradation of Forecast System'. The various components of this sub-scheme include (i) Development of an advanced operational forecast system. (ii) Upgradation and sustenance of communication systems for weather services (iii) Capacity building & outreach etc. As a part of the first component, it is planned to have a Decision Support System to enable the weather forecasters to view and analyze huge volume of data and products efficiently within given time frame, and decide the forecast and warning. A forecast & warning dissemination tool which will enable the inclusion of user friendly textual & graphical products as well as videos is also envisaged under this programme.

This along with further improvements in the observational network and numerical modeling capability as planned under ACROSS are also expected to increase the accuracy of weather forecasts.
