

**GOVERNMENT OF INDIA  
MINISTRY OF EARTH SCIENCES  
LOK SABHA  
UNSTARRED QUESTION NO.4079  
TO BE ANSWERED ON FRIDAY, MARCH 19, 2021**

**FORECAST REGARDING MONSOON CHANGES**

**4079. DR. SANJAY JAISWAL :**

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

- (a) whether Indian scientists have successfully developed various models to make precise forecast with regard to the arrival of monsoon and further changes in its movement generally in Asia and especially in India;
- (b) if so, the details thereof and the extent to which accurate forecasting of monsoon has been made;
- (c) the modality regarding the minimum advance period of forecast, its intensity and expansion, especially to provide information to farmers regarding different agro climatic areas;
- (d) the number of research institutes engaged in research activities on monsoon in the country; and
- (e) the project-wise total allocation of funds made for undertaking research in this field during the last five years?

**ANSWER**

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

- (a)-(b) Yes Sir. Under the National Monsoon Mission initiative, the Indian Institute of Tropical Meteorology (IITM), Pune, Indian National Centre for Ocean Information Services (INCOIS), Hyderabad and National Centre for Medium Range Weather Forecasting (NCMRWF), NOIDA have built a state-of-the-art coupled ocean atmospheric model for (i) improved prediction of monsoon rainfall on extended range to seasonal time scale (16 days to one season) and (ii) 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 IMD. Forecasts, early warning of severe weather events and advisories are issued by IMD at national, regional and state levels. In order to provide early warning of severe weather events, IMD has setup a network of state meteorological centres to have better coordination with the state and district level agencies.

Improvement of weather forecasting services is a continuous process. Government has initiated a comprehensive modernization programme for IMD covering up-gradation 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 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.

- (c) The onset of monsoon over Kerala is predicted about 5-10 days in advance. Subsequent arrival of monsoon over other states of the country is predicted 3-5 days in advance. This information along with the crop specific advisories are disseminated to farmers through different print/visual/Radio/ IT based media including short message service (SMS) and Interactive Voice Response Service (IVRS) facilitating for appropriate field level actions. Weather forecast based agrometeorological advisories are disseminated through Kisan portal launched by the Ministry of Agriculture and also under public private partnership.

As per the recent National Council of Applied Economic Research (NCAER) report, farming community of the country is using the Gramin Krishi Mausam Seva (GKMS) service products of India Meteorological Department (IMD) for critical farm operations Viz. i) Management of sowing (Delayed onset of rains); ii) Changing crop variety (Delay in rainfall); iii) Spraying Pesticides for disease control (occurrence of rainfall); iv) Managing Irrigation (Heavy rainfall Forecast).

- (d) The list of research Institutions in the country engaged in forecast/research on monsoon is given below.

- 1 India Meteorological Department (IMD), New Delhi
- 2 Indian Institute of Tropical Meteorology (IITM), Pune
- 3 National centre of Medium Range Weather Forecasting(NCMRWF), NOIDA
- 4 Indian Space Research Organisation-Space Applications Centre, Ahmedabad, National Atmospheric Research Laboratory, Tirupati.
- 5 Council of Scientific & Industrial Research- Fourth Paradigm Institute, Bengaluru.
- 6 Indian Institute of Technology, Bhubaneswar
- 7 Indian Institute of Technology, Kharagpur
- 8 Indian Institute of Technology, Gandhi Nagar
- 9 Indian Institute of Technology, Bombay
- 10 Indian Institute of Technology, Delhi
- 11 Indian Institute of Science, Bangalore
- 12 Andhra University
- 13 University of Kolkata

- 14 Cochin University for Science and Technology
- 15 Savithribhai Phule Pune University, Pune
- 16 Center for Development of Advanced Computing, Pune

- (e) To upgrade the forecasting capabilities, various programs are being implemented in IMD under the umbrella scheme “**Atmosphere & Climate Research-Modelling Observing Systems & Services (ACROSS)**” of the MoES. The projects under ACROSS are continuing programs from previous Plan periods encompassing various activities in an integrated manner to ensure the sustenance & augmentation of observations & enhancement of facilities required for the weather forecasting services.

Allocation of funds made for all programs under ACROSS, including research initiatives for accuracy of monsoon forecast, along with expenditure incurred during last five years is tabulated below:

<b>Total allocation of funds under ACROSS</b>			
<b>Year</b>	<b>Budget Estimates</b>	<b>Revised Estimates</b>	<b>Actual Expenditure</b>
	<b>(Rs. in Crores)</b>		
2015-16	158.18	174.45	166.68
2016-17	241.60	166.41	144.08
2017-18	188.75	149.15	134.09
2018-19	186.46	185.89	175.94
2019-20	207.17	224.73	206.04

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