

**GOVERNMENT OF INDIA
EARTH SCIENCES
LOK SABHA**

STARRED QUESTION NO:377

ANSWERED ON:21.04.2010

STUDY ON MONSOON

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Will the Minister of EARTH SCIENCES be pleased to state:

- (a) whether the Government conducts any study about the overall situation of the coming monsoon every year and give its observations/forecasts thereon;
- (b) if so, the details thereof;
- (c) whether the observations/forecasts for the year 2009-2010 were/are according to its study;
- (d) if so, the details thereof and if not, the reasons therefor;
- (e) whether any study has also been conducted in the recent past on the changing pattern of monsoon over the years;
- (f) if so, the outcome of such study; and
- (g) the corrective measures taken by the Government to improve the observations/forecasts in the matter?

Answer

MINISTER OF THE STATE (INDEPENDENT CHARGE) IN THE MINISTRY OF SCIENCE AND TECHNOLOGY, MINISTRY OF THE STATE IN THE MINISTRY OF EARTH SCIENCES, MINISTER OF THE STATE IN THE PRIME MINISTER'S OFFICE, MINISTER OF THE STATE IN THE MINISTRY OF PERSONNEL, PUBLIC GRIEVANCES & PENSIONS AND MINISTER OF THE STATE IN THE MINISTRY OF PARLIAMENTARY AFFAIRS (SHRI PRITHVIRAJ CHAVAN)

(a)- (g) A Statement is laid on the Table of the House.

STATEMENT REFERRED TO IN REPLY TO PARTS (a) TO (g) OF THE LOK SABHA STARRED QUESTION NO. 377 FOR ANSWER ON 21st APRIL, 2010

(a) Yes Madam.

(b) Every year, India Meteorological Department (IMD) conducts study about the overall emerging and ever changing situation of the impending monsoon by monitoring various weather and climate anomaly patterns around the globe that are closely associated with the indicative performance of the monsoon. IMD then evolves consensus monsoon rainfall forecast assessment for the country as a whole. Continuous efforts are made to improve long-range monsoon rainfall forecast assessment techniques so as to improve the quantitative rainfall variability over India.

IMD conducts pre-long range forecast meeting by inviting scientists from various research institutions within India that are actively working on monsoon research. These are Indian Institute of Tropical Meteorology (IITM), Pune, National Centre for Medium Range Weather Forecasting (NCMRWF), Noida, Indian Institute of Science (IISc), Bangalore, Indian Institute of Technology (IIT), New Delhi, Space Applications Centre (SAC), Ahmedabad, Centre for Development of Advanced Computing (C-DAC), Pune, Centre for Mathematical Modelling and Computer Simulation (C-MMACS), Bangalore etc. They provide their respective inputs for evolving a consensus monsoon rainfall forecast.

(c) Yes Madam.

(d) While issuing forecasts for the monsoon-2009 rainfall over the country, IMD had taken into account the impact of EL Nino on the monsoon-2009 rainfall in its assessment update issued on 25th June, 2009. During 2009, the equatorial Pacific Sea Surface Temperature (SST) anomaly scenario (Warming - EL Nino/Cooling - La Nina) till February was showing neutral impact on the monsoon, as there exists a robust inverse concurrent relationship between the monsoon rainfall and EL Nino. However, the seasonal Sea Surface Temperature tendency between March-May 2009 and December 2008-February 2009, which is the indicator of the EL Nino conditions update, suggested that the monsoon season rainfall was likely to be adversely impacted by EL Nino.

As per the first stage long range forecast, the monsoon-2009 rainfall for the country as a whole was expected to be 96% \pm 5% of long period average (LPA). In the updated forecast, it was revised to a lower value of 93% \pm 4% of LPA and further to 87% of LPA in August 2009. At the end of the season, the actual area-weighted rainfall for the country as a whole was 78% of LPA, well below the

lower limit of forecast value i.e. $87\% \pm 4\%$ apparently due to higher impact of El Nino conditions.

(e) Yes Madam.

(f) The research studies carried out so far at the Indian Institute of Tropical Meteorology (IITM), Pune indicate that the south-west monsoon rainfall over the country has decreased by nearly 4.7% during the period 1965-2006 as compared to the earlier period (1931-1964). Further, a significant increasing trend in the frequency and magnitude of high rainfall events (greater than 10cm/day) and a significant decreasing trend in the frequency of moderate events (1-5cm/day) are noticed.

(g) Improvement of weather forecasting services is a continuous process. Methodologies and modeling frameworks that have undergone rigorous performance evaluation in operational R & D environment are being adopted. Following important steps are underway:

(i) Improved numerical prediction models with 50Km grid globally and 27Kms/9Kms over India are already implemented.

(ii) All available global satellite radiance data is being assimilated in the numerical models.

(iii) Massive strengthening the existing observational network with expansion, improving the forecasting methodology and quick dissemination of weather forecast assessments/warnings to the users, a comprehensive modernization programme (Phase-I) is currently underway.

(iv) Focused R & D initiatives under National Monsoon Mission for understanding and prediction of the Indian monsoon rainfall variability, increasing accuracies of medium and long range weather predictions and potential predictability of monsoon has been taken up for implementation during the XI Plan.