GOVERNMENT OF INDIA
EARTH SCIENCES
LOK SABHA

STARRED QUESTION NO:354
ANSWERED ON:05.09.2012
MONSOON FORECASTING
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Will the Minister of EARTH SCIENCES be pleased to state:

(a) whether the Indian scientists have been able to devise various models, to predict accurately the onset and behaviours of monsoon in the country in particular and Asia in general;

(b) if so, the details thereof along with the extent of precision/accuracy in predicting monsoon;

(c) the modus operandi of dissemination of information regarding arrival of monsoon including minimum advance time of forecasting, its intensity, spread especially to the farmers in various agro-climatic zones;

(d) the total number of research institutions in the country engaged in research on monsoon; and

(e) the funds earmarked for undertaking research in the field during the last three Plan Periods, Plan-wise?

Answer

MINISTER FOR MINISTRY OF OVERSEAS INDIAN AFFAIRS, MINISTRY OF MICRO, SMALL & MEDIUM ENTERPRISES, MINISTRY OF SCIENCE & TECHNOLOGY & MINISTRY OF EARTH SCIENCES (SHRI VAYALAR RAVI)

(a) − (e) A statement is laid on the Table of the House.

STATEMENT LAID ON THE TABLE OF THE LOK SABHA IN REPLY TO (a) TO (e) OF STARRED QUESTION No. 354 REGARDING "MONSOON FORECASTING" TO BE ANSWERED ON WEDNESDAY, SEPTEMBER 05, 2012.

(a & b) IMD has been issuing forecast for the arrival of the monsoon (onset over Kerala) successfully since 2005 with an error of Â± 4 days. The operational forecasts issued during all the last three years (2010 to 2012) are presented below:

Year	Actual Onset Date	Forecast Onset Date
2010	31st May	30th May
2011	29th May	31st May
2012	5th June	1st June

Monsoon projections of IMD for the last three years and for current Monsoon-2012 so far are presented in Annexure. The present level of operational acceptability of error margin is of 5% for the forecasts of all-India seasonal monsoon rainfall. The forecast verification of last 3-years suggests that only during 2009 the error margin was higher than 5% due to persistence of warmer sea surface temperature anomaly over equatorial Pacific Ocean (El Nino) beyond the expected duration as envisaged at the time (April 2009) of finalizing Monsoon-2009 seasonal rainfall forecast.

The deficiency realized so far during Monsoon-2012 is attributed to certain extent to the delayed onset and advance of monsoon over various parts of the country (in a range of 1-2 weeks). The lower frequency of the formation of principal rain bearing cyclonic weather systems (lows and depressions) over the Indian seas of Bay of Bengal and Arabian Seas during the current season (as against the average frequency of about 6-7, only one low pressure area formed so far) is seen to be the main contributing factor for the deficit rainfall distribution observed over the country. Detailed study on the above seasonal scale monsoon circulation anomalies and associated characteristics are monitored closely to examine their impacts on the ensuing rainfall during the remaining period of August and September, 2012.

Skill of different types of IMD products served by various offices of the department across the nation is presented below:

1) Average accuracy of short range forecast in recent past is of the order of 70-95%.

2) IMD's onset of southwest monsoon forecast over Kerala has been found correct (within forecast limit) since 2005.

3) Accuracy of Long Range Forecasting for seasonal rainfall was about 50% during the period 2007-11.

4) Skill of district level rainfall forecast under Agro-meteorological Advisory Service (AAS) is 75-85% in monsoon season and more than 85% in non-monsoon season.

Weather being intrinsically variable, its forecast assessment always have a margin of error and the endeavour of IMD has always been to reduce this margin of error through the use of improved observations and advanced models. It is to mention that global weather centre's also could not predict this years monsoon rainfall deficiency realized so far over India during 2012.

(c) Mean monsoon onset-date over Kerala is 1st June with standard deviation of 8-days. After the onset, monsoon progresses northwards and reaches the northwestern most part of the country by 15th July. Forecast of onset and its northward progression are crucial to the farmers for starting agriculture operations for Kharip crops from beginning of the rainy season. Minimum one week forecast of the monsoon rainfall may be considered to give sufficient time for planning the agriculture related operations.

Integrated Agro-meteorological Advisory Service (AAS) is rendered now on twice-weekly basis in collaboration with State Agricultural Universities (SAUs), institutions of Indian Council of Agricultural Research (ICAR) etc. Realized weather of the previous week and quantitative district level weather forecast for next 5-days in respect of rainfall, maximum temperature, minimum temperature, wind speed, wind direction, relative humidity and clouds as well as weekly cumulative rainfall forecast are provided. Further, crop specific advisories, generated in partnership with SAUs and ICAR, to help the farmers are issued and widely disseminated. The AAS of IMD has been successful in providing the crop specific advisories to the farmers at the district/agro-climatic zone level twice weekly through different print/visual/Radio/ IT based wider dissemination media including short message service (SMS) and Interactive Voice Response Service (IVRS).

Weather outlook for extended period of one month will help additionally for advanced planning of the operations. Indian Institute of Tropical Meteorology (IITM), Pune is providing research based forecasts for seasonal and 4 pentad(5-day each) period to IMD.

(d) About 10 major institutions are engaged in research on monsoons

i) India Meteorological Department (IMD), New Delhi

ii) Indian Institute of Tropical Meteorology (IITM), Pune

iii) National Center for Medium Range Forecasting (NCMRWF), New Delhi

iv) Indian Institute of Science (IISC), Bengaluru

v) Centre for Mathematical Modeling and computer simulations (CMMACS),Bengaluru

vi) National Aerospace Laboratory (NAL), Bengaluru

vii) Space Application Center (SAC), Ahmedabad

viii) Indian Institute of Technology, Delhi

ix) Cochin University of Science and Technology, Kochi

x) Andhra University, Visakhapatnam

(e) Government spending on these areas of science is presented below

i) X Five Year Plan : Rs. 434crores

ii) XI Five Year Plan : Rs. 1077crores

iii) First Year of XII Plan
(Allocated during 2012-13) : Rs. 351crores