GOVERNMENT OF INDIA
EARTH SCIENCES
LOK SABHA

UNSTARRED QUESTION NO:2840
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WEATHER FORECAST
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Will the Minister of EARTH SCIENCES be pleased to state:

(a) the details of the system in place to forecast whether in the country accurately;

(b) the details of the advises generally issued to farmers to face rains, and other natural calamities;

(c) the details of normal and actual rainfall and snowfall noticed during the last six months in the country, State/UT-wise;

(d) whether the Indian Meteorological Department has not been giving correct forecast of monsoon rains including the long range forecasts; and

(e) if so, the reaction of the Government thereto along with the action plan chalked out by the Government in this regard?

Answer

MINISTER FOR MINISTRY OF SCIENCE AND TECHNOLOGY AND MINISTRY OF EARTH SCIENCES (SHRI S. JAIPAL REDDY)

(a) Improvement of weather forecasting services is a continuous process. As part of its XI five year plan, Government has initiated a comprehensive modernization programme for Earth System Science Organization-India Meteorological Department (ESSO-IMD) covering 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 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.

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 9Kms/3Kms grid over India/regional/mega city domains.

The performance evaluation of the updated global/meso-scale forecast systems for the past 5-7 years have demonstrated enhanced forecast skill by about 18% quantitatively as far as the track and landfall forecasts of the tropical cyclones are concerned.

As and when the cyclone systems move in to the 500Km surveillance range of DWRs, identification of strong wind zones and pockets of heavy rainfall within the core cyclone area is carried out and their rapid changes are monitored on continuous basis. IMD currently operates 5- Doppler Weather Radars (DWR) at Chennai, Machilipatnam, Visakhapatnam, Kolkata, Sriharikota on the east coast along with a network of Automatic Weather Stations (AWS) and Automatic Rain Gauges (ARG) for continuous weather surveillance over the Bay of Bengal and Arabian Sea.

ESSO-IMD has operationalized its location specific nowcasting weather service across the country. This service activity currently covers 117 urban centres on experimental basis under which nowcast of severe weather (Thunderstorms; heavy rainfall from lows/depressions over the land) in 3-6h range is issued. Origin, development/movement of severe weather phenomena are regularly monitored through DWRs and with all available other observing systems (AWSs; ARGs; Automatic Weather Observing Systems-AWOS; satellite derived wind vectors, temperature, moisture fields etc.)

(b) 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 ESSO-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) facilitating for appropriate field level actions.

(c) The details of normal and actual rainfall for September 2012 to February 2013 is given in Annexure-I and precipitation (snowfall and rainfall together) during the last six month in the country is given in Annexure-II. It is to mention that the stations in J & K and Himachal Pradesh (as mentioned in Table-2 and Table-3 of the Annexure) have indeed recorded above normal precipitation (largely

solid precipitation − snow/ice) during the month Feb., 2013.

(d) No Sir. The accuracy of short range (up to 3-days in advance) monsoon forecasts is found to be of the order of 70-95%. The skill of district level medium range rainfall forecast (up to 5-7days in advance) is 75-85% in monsoon season and more than 85% in non-monsoon seasons. The operational monsoon onset forecast over Kerala has been found to be correct (within the forecast limits) during all the 8 years (2005-2012).

The present long range forecasting system based on the statistical models has shown some useful skill in predicting the all India season rainfall and the methodology has performed better than the earlier models that were updated in 2003. Details of the forecast errors are presented below:

Period	No. of years during Which Errors were Within Â±4%	No. of years during Which Errors were Within Â±4-8%	No. of years during Which Errors were higher than Â±8%
2003-12	5 (2003; 2005; 2008; 2010; 2012)	2 (2006; 2011)	3 (2004; 2007; 2009)
1993-02	2 (1993; 1995)	4 (1996; 1998; 2000; 2001)	4 (1994; 1997; 1999; 2002)

(e) However, in order to overcome the limitations of the statistical models used so far for long-range monsoon rainfall forecasts, dynamical model framework is currently put under experimentation and performance evaluation under the National Monsoon Mission.