GOVERNMENT OF INDIA
MINISTRY OF EARTH SCIENCES
LOK SABHA
UNSTARRED QUESTION No. 3899
TO BE ANSWERED ON WEDNESDAY, AUGUST 6, 2014

ACCURACY OF WEATHER FORECASTS

3899. SHRI K.N.RAMACHANDRAN:
SHRI GODSE HEMANT TUKARAM:
SHRI ANURAG SINGH THAKUR:
SHRI HANSRAJ GANGARAM AHIR:

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

(a) whether percentage of accuracy of meteorological forecasts are very low;
(b) if so, whether the Government has prepared any plan to improve the functioning of the scientists engaged in the field of meteorological forecasts;
(c) if so, the details thereof;
(d) whether the infrastructure required for taking corrective measures in weather science is available in the country; and
(e) if so, the detail thereof and the steps proposed to be taken by the Government to upgrade infrastructure of Indian Meteorological Department?

ANSWER
MINISTER FOR MINISTRY OF SCIENCE AND TECHNOLOGY AND
MINISTRY OF EARTH SCIENCES (Independent Charge)
(DR. JITENDRA SINGH)

(a) No Madam. The weather forecasting systems in the country are comparable to most of the countries in the world with respect to rainfall forecasting. During the past few years, the Earth System Science organisation –India Meteorological Department (ESSO-IMD) has been continuously improving weather prediction services in terms of accuracy, lead time and associated impact. Manifestation of such quantitative improvement may be seen with accurate prediction of Very Severe Cyclonic Storm 'Phailin' and the heavy rainfall events during monsoon season 2013 and concurrently during monsoon-2014.

(b)&(c) 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 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 ESSO- 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. Further, several manual operations have been fully automated.

In order to capture the characteristics of the severe weather in real time, 24X7 monitoring system comprising 675 Nos. of AWSs; 1209 Nos. of ARGs; 18 S and C-Band DWRs have been commissioned at Chennai, Sriharikota, Machilipatnam, Visakhapatnam, Kolkata, Mumbai, Bhuj, Hyderabad, Nagpur, Patiala, Delhi Palam, Lucknow, Patna, Mohanbari, Agartala, Delhi Lodi Road, Bhopal and Jaipur.

High Performance Computing (HPC) systems have been used to enhance the weather forecasting capacities by assimilating all available global satellite data for forecast generation. The global model that was earlier run at 50Km grid scale are now run at 22Km grid. The regional scale model run earlier at 27Km grid is replaced by 9Km and 3Km grid scale models. The accuracy of short range (up to 3-days in advance) monsoon forecasts has improved from 50-60% to 70-95%. The skill of district level medium range rainfall forecast (up to 5-7days in advance) has improved from 60-70% to 75-85% in monsoon season and from 70-75% to 85% in non-monsoon seasons.

As far as the track and landfall forecasts of the tropical cyclones are concerned, the performance evaluation of the updated forecast systems for the past 5-years, have demonstrated enhanced forecast skill by about 18%. ESSO-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.

ESSO-IMD has operationalized its location specific nowcasting (near real- time) weather service for severe weather (Thunderstorms; heavy rainfall from lows/depressions over the land) across the country. This service activity currently covers 117 urban centres on experimental basis under which nowcast of 3-6hour range is issued. Origin, development/movement of severe weather phenomena are regularly monitored through DWRs and with all other available observing systems.

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. District level weather forecast for next 5-days in respect of:

- Rainfall
- maximum temperature, minimum temperature,
- wind speed, wind direction,
- relative humidity and clouds
- weekly cumulative rainfall forecast

are provided. Further, crop specific advisories 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 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.

(d) & (e) Based on scientific assessment of the need for further augmentation of observing system network expansion has been formulated. The upgradation of the observing system, high performance computing, communication, forecast/warning systems, product dissemination systems etc. are part of a continuous process by which state-of-the-art science and technology tools can be made accessible to the scientists engaged in weather research and forecasting towards enhancing the service quality.

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