GOVERNMENT OF INDIA
MINISTRY OF EARTH SCIENCES
LOK SABHA
UNSTARRED QUESTION No. 1935
TO BE ANSWERED ON FRIDAY, NOVEMBER 29, 2019

RAINFALL PREDICTION

1935. DR. SHRIKANT EKNATH SHINDE:
SHRI DHAIRYASHEEL SAMBHAJIRAO MANE:
DR. SUJAY RADHAKRISHNA VIKHE PATIL:

Will the Minister of EARTH SCIENCES be pleased to state:

(a) the details of the current mechanism being followed to predict the rainfall;
(b) whether the Government is considering to take any steps to devise an intelligent prediction system with modern analytic tools by using local weather information for rainfall prediction;
(c) if so, the details thereof and if not, the reasons therefor;
(d) the details of current flood warning system being used in the country; and
(e) whether the Government is taking any steps to improve the system, if so, the details thereof and if not, the reasons therefor?

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

(a) India Meteorological Department (IMD) issues four types of forecasts during the monsoon season i.e., seasonal forecast (for the whole season), extended range forecast (up to four weeks), short-medium range forecast (up to 7 days) and nowcast (up to 3 hrs). Under the National Monsoon Mission, Ministry of Earth Sciences (MoES) has implemented two state-of-the-art dynamical prediction systems for short range to medium, extended range and seasonal forecasts. All these initiatives have helped to improve the skill of monsoon forecasts over the country. IMD started using the Monsoon Mission dynamical model to prepare operational seasonal forecast since 2017.

An improved suite of prediction models has already been implemented operationally at India Meteorological Department (IMD) for enhanced short range weather forecasting through assimilation of all available Indian and global satellite data in real time.

Since December 2016 IMD is using the Global Forecast System (GFS) and Unified model run at National Centre For Medium Range Weather Forecast (NCMRWF) operationally every day to generate deterministic forecasts at 12 km horizontal resolution in the short to medium range (Up to 10 days). The GFS assimilates global conventional atmospheric data as well as the data from satellites and weather radars. There also exists a high resolution meso-scale model with 3 km resolution to provide location specific forecast.

In addition, a high resolution (12 km grid scale) state of the art Global Ensemble Prediction System (GEPS) namely Global Ensemble Forecasting System (GEFS) and Unified Model Ensemble Prediction System (UMEPS) was commissioned on 01 June 2018 for generating operational probabilistic weather forecasts for 10 days. The GEPS has enhanced the weather information being provided by the current models by quantifying the uncertainties in the weather forecasts.

(b) & (c) The above mentioned forecast systems will be improved further for better accuracy with the enhancement in observational systems and advancement in numerical modeling. However, the Artificial Intelligence (AI) methods will be extensively used to improve weather forecasts.

(d) & (e) IMD has a shared mandate with Central Water Commission (CWC) for flood forecasting.

Heavy rainfall events may lead to floods over different river basins of the country. River basin floods are dealt by the CWC. Flood Meteorological Offices (FMOs) operated by the IMD at thirteen locations viz., Agra, Ahmedabad, Asansol, Bhubaneshwar, Guwahati, Hyderabad, Jalpaiguri, Lucknow, New Delhi, Patna, Srinagar, Bengaluru and Chennai provide meteorological support to the CWC for issuing flood warnings in respect of the 43 rivers of India covering 146 river basins. CWC issues flood forecasts for about 6 hrs. to 30 hrs. in advance for 176 stations using Quantitative Precipitation Forecast (QPF) received from FMOs and in-situ hydro-meteorological data.

Apart from this, IMD also supports Damodar Valley Corporation (DVC) by providing Quantitative Precipitation Forecast (QPF) for Damodar river basin areas for their flood forecasting activities.

Central Water Commission is working in close association with IMD and State Governments for timely flood forecast whenever the river

water level rises above warning level. To meet the requirement of State Governments, IMD Officers invariably attend all the meetings called by the State Governments for reviewing the preparedness on floods by various agencies.

In order to cater to the services of hydro-meteorological events occurring in short duration of time, IMD is in the process of implementing a Flash Flood Guidance System (FFGS) in the near future by which a diagnostic value within a watershed required to produce flooding at the outlet of the catchment can be estimated, to support the flood warning services.

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