GOVERNMENT OF INDIA
MINISTRY OF EARTH SCIENCES
RAJYA SABHA
UNSTARRED QUESTION NO. 516
ANSWERED ON 07/12/2023

ACCURATE PREDICTION AND DISSEMINATION OF WEATHER UPDATES

516. SHRI MUKUL BALKRISHNA WASNIK:

Will the Minister of **Earth Sciences** be pleased to state:

(a)   whether it is a fact that in view of the increasing number of episodes of extreme weather phenomena the need for enhanced accuracy in prediction and dissemination of weather updates has become all the more necessary; and

(b)   if so, the details on steps taken by the Government for creating the necessary infrastructure, procurement of required equipment and channelising the services of suitable personnel for the purpose?

ANSWER
THE MINISTER FOR EARTH SCIENCES
(SHRI KIREN RIJIJU)

(a)   Yes, Sir.

(b)   Studies indicate that there is an increase in extreme weather events such as heavy rainfall, floods, droughts, cyclones, heat waves and cold wave conditions in the country. India Meteorological Department (IMD) is continuously enhancing and upgrading the meteorological observations, communications, modeling and forecasting system. There has been about 40% improvement in forecast accuracy of severe weather events including heavy rainfall events in recent five years compared to previous

The initiatives taken by the Government during the last 10 years to improve monitoring of severe weather by augmenting the observational system in the country are given below:

- 38 Doppler Weather Radar (DWR) network in 2023 against 15 in 2014
- 1208 Automatic Weather Stations (AWS) in 2023 against 675 in 2014
- 1382 Automatic Rain Gauges (ARG) in 2023 against 1350 in 2014
- Meso-network of AWS and ARG stations in Mumbai, Pune, and the entire state of Kerala in 2023 against meso-network of AWS only in the NCR of Delhi in 2014
- 35 High Wind Speed Recorders in 2023 against 19 in 2014
- 56 upper air observation systems in 2023 against 43 in 2014

- 23 Manual Pilot Balloon (PB) stations upgraded to GPS based stations while there was no GPS based PB station in 2014
- 5896 District-wise Rainfall Monitoring Scheme (DRMS) stations in 2023 against 3955 in 2014
- Two geostationary satellites, viz., INSAT-3D and INSAT-3DR in 2023 against only one such satellite INSAT-3D in 2014

Numerical weather prediction (NWP) model guidance is one of the most important inputs utilized in weather forecasting. The deterministic as well as probabilistic guidance from various NWP modeling systems implemented at National Centre for Medium Range Weather Forecasting (NCMRWF) and Indian Institute of Tropical Meteorology (IITM) facilitate IMD forecasters to provide efficient weather services. India Meteorological Department (IMD) issues various outlook/forecast/warning at various time and spatial scales for Public as well as Disaster Management Authorities for the preparedness of extreme weather events. India is now having one of the best dynamical prediction systems for supporting early warning. IMD has developed capability for generating real time forecasts and warnings in all spatial scales from a location to Block, district, meteorological subdivisions and homogeneous regions and temporal scales of a few hours (nowcast), 3 days (short range forecast), 4-7 days (medium range forecast) 1-4 weeks (extended range forecast) and one month to a season (long range forecast). A very short range forecast of severe weather up to three hours (nowcast) for all the districts and 1089 cities and towns. These nowcasts are updated every three hours.

IMD has also implemented Impact Based Forecast (IBF) in the recent past which gives details of what the weather will do rather than what the weather will be. It contains the details of impacts expected from the severe weather elements and guidelines to Public about do's and don'ts while getting exposed to severe weather. These guidelines are finalised in collaboration with National Disaster Management Authority (NDMA) and is already implemented successfully for cyclones, heat waves, thunderstorms, and heavy rainfall events. While issuing the warning suitable colour code is used to bring out the impact of the severe weather expected and to signal the Disaster Management about the course of action to be taken with respect to the impending disaster weather event.

The forecasts and warnings are disseminated to users including disaster managers by e-mails, social media platforms on regular basis. The nowcasts related to severe weather is disseminated through SMS to the registered users. In addition, as and when the situation arises, Press Releases are issued by IMD and the same are also disseminated by all the platforms mentioned above. IMD has launched seven of its services (Current Weather, Nowcast, City Forecast, Rainfall Information, Tourism Forecast, Warnings and Cyclone) with 'UMANG' mobile App for use by Public. Also, IMD had developed mobile App 'MAUSAM' for weather forecasting dissemination, 'Meghdoot' for Agromet advisory dissemination and 'Damini' for lightning alerts.

Ministry has a well-developed human resource management plan. Under this policy people are recruited with desired background and knowledge for specified purposes like:

- Weather and climate forecasting
- Instrumentation, telecommunication, and satellite meteorology
- Sectorial application, e.g., agriculture, aviation etc.

After the recruitment they are made well trained for their specified areas. After the completion of training, they are posted in specified field. To further improve their expertise field, "Refresher Training courses are organised time to time. This way suitable personnel are channelized for various services in IMD.

****