

GOVERNMENT OF INDIA
MINISTRY OF EARTH SCIENCES
RAJYA SABHA
UNSTARRED QUESTION NO. 515
ANSWERED ON 07/12/2023

**MEASURES TO MONITOR THE NON-FORECASTED HEAVY RAINS
AND WATERLOGGING**

515. SMT. JEBI MATHER HISHAM:

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

- (a) whether Government will take efficacious measures to monitor the non-forecasted heavy rains and waterlogging;
- (b) whether Government will strengthen the monitoring mechanisms to detect and forecast cloud bursts;
- (c) whether Government will revisit the flood management policies to strengthen the skillful and precise forecasting mechanisms of rainfall in the wake of the frequent cloud bursts causing flash floods; and
- (d) whether Government will take appropriate and time-bound measures for mapping the cloud burst-prone regions across the country?

ANSWER

THE MINISTER OF EARTH SCIENCES
(SHRI KIREN RIJJU)

- (a) Yes Sir. India Meteorological Department (IMD) is continuously enhancing and upgrading the meteorological observations, communications, modeling and forecasting system. The forecasts and warnings are issued at the national, State and district levels. Most of the forecasts, issued in all time scales remain within the forecast limit or close to the error limit. There has been about 40% improvement in forecast accuracy of severe weather events including heavy rainfall events in recent five years compared to previous years.
- (b) As cloud bursts are highly localized and are of very short duration and hence challenging to forecast. However, ministry has taken-up various initiatives to strengthen the monitoring mechanisms for the timely detection and accurate forecast of cloud bursts. India Meteorological Department currently utilize Radio Detection And Ranging (RADAR), Automatic Rain Gauges for monitoring these events. These data will be assimilated into High-Resolution Rapid Refresh Modelling System (IMD-HRRR) and Electric Weather Research and Forecasting (EWRF) models to better capture and forecast the cloud bursts.

- (c) In order to cater the services of hydro-meteorological events occurring in short duration of time, IMD is issuing Flash Flood Guidance (FFG) by which the volume of water within a watershed required to produce flooding at the outlet of the catchment is estimated. Flash Flood Guidance bulletin is generated on daily basis since 2020 and disseminated to the users including Central Water Commission (CWC) every six hours on routine basis. The Flash Flood Guidance is a robust system designed to provide the necessary products in real-time to support the development of warnings for flash floods about 6-24 hours in advance at the watershed level with resolution of 4kmx4km for the Flash Flood prone South Asian countries viz. India, Nepal, Bhutan, Bangladesh and Sri Lanka.
- For addressing impacts of floods due to heavy rainfall, IMD is issuing Impact Based Forecast (IBF) which give details of what the weather will do rather than what the weather will be. It contains the details of impacts expected from such severe weather events and guidelines to public about do's and don'ts while getting exposed to them. These guidelines are finalized in collaboration with National Disaster Management Authority (NDMA) and successfully implemented for cyclones, heat waves, thunderstorms, and heavy rainfall events.
 - Also, IMD provides actual rainfall information in different spatial and temporal scales like districts, States, River catchment & meteorological subdivisions level on daily, weekly, monthly & seasonal scale to support flood monitoring.
- (d) Cloud bursts are highly localized and are of very short duration and most of the cloudbursts occur over hilly region. Some studies which have been conducted with limited data indicate that southern rim of the Indian Himalayas especially over Uttarakhand, Himachal Pradesh and hilly areas of northeast India are prone to cloudbursts. West coast of India covering windward side of Western Ghats from Goa to Gujarat is also prone to cloudbursts. Further, the regions with height of elevation of 1000 m to 2500 m have been more vulnerable to cloud bursts.
