

**GOVERNMENT OF INDIA
MINISTRY OF EARTH SCIENCES
LOK SABHA
UNSTARRED QUESTION NO. 2931
TO BE ANSWERED ON WEDNESDAY, 3RD AUGUST, 2022**

ACCURATE PREDICTIONS OF WEATHER

2931. SHRI RAVNEET SINGH BITTU:

Will the Minister of EARTH SCIENCES be pleased to state:

- (a) whether the India Meteorological Department (IMD) have been repeatedly failing to give accurate predictions of the monsoon trends in the NCR of Delhi in the current monsoon season;
- (b) if so, the details thereof along with the reasons thereon;
- (c) whether the IMD has developed any comprehensive mechanism to correctly predict the various natural disasters like floods, earthquakes, cloudbursts in different parts of the country and if so, the details thereof;
- (d) whether the Government is taking any measures to provide assistance, both financial and technical to IMD as well as conduct training programmes to help upgrade its equipments and technical knowhow to enable accurate predictions in the future; and
- (e) if so, the details thereof and if not, the reasons therefor?

ANSWER
THE MINISTER OF STATE (INDEPENDENT CHARGE) FOR
MINISTRY OF SCIENCE AND TECHNOLOGY
AND EARTH SCIENCES
(DR. JITENDRA SINGH)

- (a)-(b) No Sir. Monsoon has set in over Delhi on 30th June 2022. It was predicted 3 days in advance. Regarding the forecast for monsoon rainfall over Delhi it is mentioned that the rainfall over Delhi had been well predicted as per the verification of forecast carried out for the period from 1st to 15th July 2022. Details of the same are given in **Annexure-I** and **Annexure-II** for reference.
- (c) IMD issues forecasts and warnings related to extreme weather events and share the same with Disaster Management Authorities as well as general public through various platforms for necessary preparedness and to support mitigation measures.

IMD follows a seamless forecasting strategy. The long-range forecasts (for the whole season) issued are being followed with extended range forecast issued on every Thursday with a validity period of four weeks. To follow up the extended range forecast, IMD issues short to medium range forecast and warnings daily valid up to next five days with an outlook for subsequent two days. The short to medium range forecast and warning at district and station level are issued by state level Meteorological Centres (MCs)/Regional Meteorological Centres (RMCs) with a validity of next five days and are updated twice a day. The short to medium range forecast is followed by 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.

The Central Water Commission (CWC) has the responsibility of Flood warning. However, IMD supports flood warning services of CWC, by providing observed and forecasted rainfall. Heavy rainfall events lead to floods over different river basins of the country. River basin floods are dealt by the CWC. In order to meet specific requirements of flood forecasting, which is provided by CWC, IMD operates Flood Meteorological Offices (FMOs) at fourteen locations viz., Agra, Ahmedabad, Asansol, Bhubaneswar, Guwahati, Hyderabad, Jalpaiguri, Lucknow, New Delhi, Patna, Srinagar, Bengaluru, Thiruvananthapuram and Chennai. 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. CWC is working in close association with IMD and State Governments for timely flood forecast whenever the river water level rises above warning level. Flood Meteorological Offices (FMO) operated by IMD provide meteorological support to the CWC for issuing flood warnings well in advance in respect of 153 river basins. CWC issues flood forecasts 6 hrs. to 30 hrs. in advance using QPF received from FMOs of IMD and in-situ hydrometeorological data.

The cloud burst events are considered when the rainfall occurs at the rate of 10 cm/ hour or more over a geographical area of approximately 20-30 square km. The occurrence of the cloud burst is not predictable worldwide.

National Centre for Seismology, under the Ministry of Earth Sciences (MoES) monitors the Earthquake events in the country. The occurrence of Earthquake is also not predictable worldwide.

- (d)-(e) To upgrade the forecasting capabilities and enhancement in Weather & Climate services throughout the country various activities are underway in India Meteorological Department (IMD) under the umbrella Central Sector Scheme ACROSS. There are 4 sub-schemes of IMD under ACROSS namely, Atmospheric Observation Network (AON), Upgradation of Forecast System (UFS), Weather & Climate Services (WCS) and Commissioning of Polarimetric Doppler Weather Radars (PDWR) aimed at expansion of observational network and improvement in Weather & Climate services. The activities under ACROSS-IMD are continuing in nature, being carried forward from previous plan periods. Training and manpower development activities are regularly carried out in order to provide seamless meteorological services to the country.

ANNEXURE-I**Rainfall forecast over Delhi during July and realised rainfall**

| DATE | FORECAST ISSUED (BEFORE 24 HRS) | RAINFALL (REALISED) |
|-------------|---|---|
| 01.07.2022 | Moderate rain/ thundershowers with heavy rain at isolated places. | Light to moderate rainfall at most places with isolated heavy rainfall. |
| 02.07.2022 | Light to moderate rain/ thundershowers. | Light to moderate rainfall at most places. |
| 03.07.2022 | Light rain/ thundershowers. | Light to moderate rainfall at a few places. |
| 04.07.2022 | Light rain/ thundershowers. | Light to moderate rainfall at most places. |
| 05.07.2022 | Light rain/ thundershowers. | Light rainfall at many places. |
| 06.07.2022 | Light rain/ thundershowers. | Light rainfall at isolated places. |
| 07.07.2022 | Light rain/ thundershowers. | Light rainfall at isolated places. |
| 08.07.2022 | Very light rain/ drizzle at isolated places. | Light rainfall at isolated places. |
| 09.07.2022 | Possibility of thundery development. | Light rainfall at isolated places. |
| 10.07.2022 | Light to moderate rain/ thundershowers. | Very light rainfall at isolated places. |
| 11.07.2022 | Light to moderate rain/ thundershowers. | Light rainfall at isolated places. |
| 12.07.2022 | Light rain/ thundershowers. | Light to moderate rainfall at most places with heavy rainfall at isolated places. |
| 13.07.2022 | Moderate rain/ thundershowers. | Light to moderate rainfall at many places. |
| 14.07.2022 | Light to moderate rain/ thundershowers at a few places. | Light to moderate rainfall at many places. |
| 15.07.2022 | Light to moderate rain/ thundershowers at a few places. | Light rainfall at most places. |

SPATIAL DISTRIBUTION (% of stations reporting)

| % Stations | Category |
|-------------------|---|
| 76-100 | Widespread (WS/ Most places) |
| 51-75 | Fairly Widespread (FWS/ Many places) |
| 26-50 | Scattered (SCT/ A Few Places) |
| 1-25 | Isolated (ISOL) |

RAINFALL INTENSITY OF 24 HOURS ACCUMULATED RAINFALL

| Terminology | Rainfall Range in mm | Terminology | Rainfall Range in mm |
|----------------------------|-----------------------------|---------------------------------|-----------------------------|
| Very Light Rainfall | Trace – 2.4 | Heavy Rainfall | 64.5 – 115.5 |
| Light rainfall | 2.5 – 15.5 | Very Heavy Rainfall | 115.6 – 204.4 |
| Moderate Rainfall | 15.6 – 64.4 | Extremely Heavy Rainfall | >= 204.5 |

ANNEXURE-II

Datewise rainfall (in mm) recorded over different stations in Delhi/NCR are given below

| Date | Station | Rainfall | | |
|------------|-----------------------|----------|--|--|
| 01.07.2022 | Safdarjung | 117.2 | | |
| | Palam | 31.8 | | |
| | Lodhi Road | 108.4 | | |
| | Ridge | 65.4 | | |
| | Ayanagar | 51.9 | | |
| | DU(AWS) | 67.2 | | |
| | PUSA(AWS) | 45.0 | | |
| | JAFARPUR(AWS) | 11.0 | | |
| | NAJAFGARH(AWS) | 17.0 | | |
| | PITAMPURA(AWS) | 56.0 | | |
| | SPS MAYUR VIHAR(AWS) | 4.0 | | |
| 02.07.2022 | Safdarjung | 1.9 | | |
| | Lodhi Road | 4.8 | | |
| | Ridge | 7.6 | | |
| | Ayanagar | 14.8 | | |
| | DU(AWS) | 5.5 | | |
| | PUSA(AWS) | 6.0 | | |
| | JAFARPUR(AWS) | 6.0 | | |
| | NAJAFGARH(AWS) | 5.5 | | |
| | PITAMPURA(AWS) | 23.0 | | |
| | SPS MAYUR VIHAR(AWS) | 18.0 | | |
| 03.07.2022 | Ayanagar | TRACE | | |
| | JAFARPUR(AWS) | 5.0 | | |
| | NAJAFGARH(AWS) | 105.0 | | |
| | SPS MAYUR VIHAR (AWS) | 7.0 | | |
| 04.07.2022 | Safdarjung | 0.1 | | |
| | Lodhi Road | 0.4 | | |
| | Ridge | 22.0 | | |
| | Ayanagar | TRACE | | |
| | DU(AWS) | 19.0 | | |
| | PUSA(AWS) | 0.5 | | |
| | JAFARPUR(AWS) | 4.0 | | |
| | NAJAFGARH(AWS) | 0.5 | | |
| | PITAMPURA(AWS) | 0.5 | | |
| | SPS MAYUR VIHAR(AWS) | 16.0 | | |

| | | | | |
|------------|-----------------------|-------|--|--|
| 05.07.2022 | Safdarjung | 0.6 | | |
| | Lodhi Road | TRACE | | |
| | Ridge | 0.2 | | |
| | Ayanagar | 0.0 | | |
| | DU(AWS) | 4.0 | | |
| | JAFARPUR(AWS) | 3.5 | | |
| | NAJAFGARH(AWS) | 1.0 | | |
| | SPORTS COMPLEX(AWS) | 2.0 | | |
| | SPS MAYUR VIHAR (AWS) | 11.0 | | |
| | | | | |
| 06.07.2022 | JAFARPUR(AWS) | 3.0 | | |
| | SPS MAYUR VIHAR (AWS) | 8.0 | | |
| 07.07.2022 | JAFARPUR(AWS) | 3.0 | | |
| | SPS MAYUR VIHAR (AWS) | 4.0 | | |
| 08.07.2022 | JAFARPUR(AWS) | 1.0 | | |
| | SPS MAYUR VIHAR (AWS) | 0.5 | | |
| 09.07.2022 | Safdarjung | 8.8 | | |
| | Lodhi Road | 11.0 | | |
| | Ridge | 1.2 | | |
| 10.07.2022 | Ridge | TRACE | | |
| 11.07.2022 | Palam | TRACE | | |
| | Ayanagar | TRACE | | |
| | JAFARPUR(AWS) | 5.5 | | |
| 12.07.2022 | Safdarjung | 1.8 | | |
| | Palam | TRACE | | |
| | Lodhi Road | 2.4 | | |
| | Ridge | 38.2 | | |
| | Narela(AWS) | 29.0 | | |
| | JAFARPUR(AWS) | 2.5 | | |
| | NAJAFGARH(AWS) | 6.0 | | |
| | PITAMPURA(AWS) | 81.0 | | |
| | PUSA(AWS) | 35.0 | | |
| | DU(AWS) | 34.5 | | |
| 13.07.2022 | Safdarjung | 2.1 | | |
| | Palam | 3.1 | | |
| | Lodi Road | 1.6 | | |
| | Ridge | 0.2 | | |
| | Ayanagar | Trace | | |
| | Pusa | 1.0 | | |
| | Jafarpur | 4.0 | | |
| | Najafgarh | 2.0 | | |
| | SPS Mayur Vihar | 13.0 | | |

| | | | | |
|------------|------------------|-------|--|--|
| 14.07.2022 | Safdarjung | TRACE | | |
| | Palam | TRACE | | |
| | Lodi Road | 0.1 | | |
| | Ayanagar | 0.8 | | |
| | Narela | 7.0 | | |
| | Pusa | 1.0 | | |
| | Jafarpur | 4.0 | | |
| | Najafgarh | 2.0 | | |
| 15.07.2022 | Safdarjung | Trace | | |
| | Palam | 2.0 | | |
| | Lodi Road | Trace | | |
| | Ridge | Trace | | |
| | Ayanagar | 1.5 | | |
| | Narela | 5.0 | | |
| | Pusa | 0.5 | | |
| | Jafarpur | 2.0 | | |
| | Najafgarh | 0.5 | | |
| | SPS Mayur Vihar | 2.0 | | |
| | Delhi University | 0.5 | | |

LEGENDS:

RAINFALL INTENSITY OF 24 HOURS ACCUMULATED RAINFALL

| Terminology | Rainfall Range in mm | Terminology | Rainfall Range in mm |
|----------------------------|-----------------------------|---------------------------------|-----------------------------|
| Very Light Rainfall | Trace – 2.4 | Heavy Rainfall | 64.5 – 115.5 |
| Light rainfall | 2.5 – 15.5 | Very Heavy Rainfall | 115.6 – 204.4 |
| Moderate Rainfall | 15.6 – 64.4 | Extremely Heavy Rainfall | >= 204.5 |
