

# PARLIAMENT QUESTION: EARLY WARNING SYSTEM

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The India Meteorological Department (IMD), under the Ministry of Earth Sciences (MoES), has developed a multi-hazard early warning (MHEWS) system for generation and dissemination of accurate impact based weather forecasting and risk-based warning in a timely manner during various severe weather events such as cyclone, heavy rainfall, heat wave, cold wave, etc. through efficient dissemination system consisting of various communication channels weather forecasts and warnings are delivered to the disaster managers at the National/State levels, various stakeholders and public for preparedness before the event, mitigation measures during the event and restoration & rescue works aftermath.

The IMD provides Impact-Based Forecast (IBF) & Risk-Based Warning (RBW) at the district level using different colour codes since 2020. The multi-hazard early warning Decision Support System (DSS) has been developed indigenously by IMD and has been in operation since 2023. It is used to provide IBF& RBW at the district level on the GIS platform.

Presently, there is no scientific technique available anywhere in the world to precisely predict earthquakes in terms of time, location, and magnitude; hence, no proven system exists in the country to provide early earthquake warning. The National Centre for Seismology (NCS) under the Ministry is monitoring the earthquakes occurring in and around the country through its seismological network. Further, provides precise earthquake information soon after an earthquake, including location, date, and time of occurrence, and magnitude. Also, an intensity map is generated and populated on the public platform, indicating the likely variation of ground shaking from the epicentral region to surrounding areas. These details are made available to various disaster management authorities, other stakeholders, and the public as soon as possible through the NCS-MoES website, app, SMS, FAX, e-mail, WhatsApp, X, and Facebook.

The Central Water Commission (CWC) under the Ministry of Jal Shakti (MoJS) is mandated to issue short-range flood forecasts with a lead time of up to 24 hours to concerned State Governments at identified locations. Timely flood forecasts are being issued when a certain threshold limit is reached. CWC is currently providing a seven-day advisory flood forecast on its web portal <https://aff.india-water.gov.in/> through pan-India rainfall-based mathematical modeling for major river basins of the country. CWC takes immense steps and adopts various dissemination mechanisms to get maximum reach to the flood warnings produced, so that mitigation measures can be adopted by State Governments, SDMA, NDMA, and the public. The flood forecasts formulated by CWC are disseminated to all stakeholders through the Flood Forecasting Website (<https://ffs.india-water.gov.in/>)/FloodWatch India 2.0 App/E-mail/Whatsapp/Facebook-CWCOfficial.FF/X-CWCOfficial\_FF, Youtube-CWC Flood updates, and CAP Alert through the NDMA Sachet portal. The CWC developed the "Flood Watch India" mobile App, which was launched on 17th August 2023. Further, a C-FLOOD is a web-based platform, developed and inaugurated on 2nd July 2025, which provides two-day advance inundation forecasts up to village level in the form of flood inundation maps and water level predictions.

IMD has a 3-tier (National, Regional, and State levels) early warning system for the monitoring and forecasting of severe weather events at different parts of the country. Accordingly, at the State level, IMD issues impact-based weather forecasts and risk-based warnings regularly from the designated Regional Meteorological Centres (RMCs) and Meteorological Centres (MCs).

The Ministry has developed advanced early warning systems for severe weather events, including cyclones, heavy rainfall, etc. These systems are supported by a state-of-the-art observation network comprising surface and upper-air observations, remote sensing, high-resolution dynamical models, and an end-to-end GIS-based Decision Support System (DSS) developed by MoES institutions, which serves as the front end for early warning systems to enable detection and monitoring of weather hazards across the country. The system is integrated with modern telecommunications technologies to ensure the timely dissemination of information. Effective dissemination methods for weather information and alerts by the MoES are as follows:

- Public alerts and information are disseminated through mobile applications such as MAUSAM, MEGHDOOT, DAMINI, and UMANG.
- Digital dissemination channels include e-mail and SMS-based nowcasting and forecasting alerts to registered users.
- Alerts are issued through the Common Alerting Protocol (CAP) and the SACHET App.
- Information is shared via social media and mass media platforms.
- District Collectors are informed through direct e-mail and WhatsApp group notifications, in coordination with the State Governments.
- Broadcast dissemination is carried out through community radio, public broadcasting systems, and other local communication networks.
- Dissemination is also undertaken through State Government mobile applications.
- Gram Panchayat-level weather forecasting (GPLWF) is facilitated through digital platforms such as e-Gramswaraj, Meri Panchayat App, and e-Manchitra, in collaboration with the Ministry of Panchayati Raj.
- Weather information is disseminated to Pashu Sakhi and Krishi Sakhi at the block and Panchayat levels in collaboration with the Ministry of Rural Development.
- Forecasts are accessible through the Mausamgram portal of the India Meteorological Department.

This information was submitted by Union Minister of State (Independent Charge) for Earth Sciences and Science & Technology Dr. Jitendra Singh in Lok Sabha on 1st April 2026

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**NKR/JKP**

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