

**GOVERNMENT OF INDIA
MINISTRY OF EARTH SCIENCES
LOK SABHA
STARRED QUESTION NO. *353
TO BE ANSWERED ON WEDNESDAY, 12TH AUGUST, 2026**

STRENGTHENING MULTI-HAZARD EARLY WARNING SYSTEMS

*353. SHRI YOGENDER CHANDOLIA:
SHRI BIBHU PRASAD TARAI

Will the Minister of EARTH SCIENCES be pleased to state:

- (a) whether the Government has reviewed the implementation of Multi-Hazard Early Warning Systems (MHEWSs) for cyclones, floods, heatwaves, lightning and other extreme weather events and if so, the details thereof, State/UT-wise including Bulandshahr district of Uttar Pradesh and Amalapuram Lok Sabha Constituency of Andhra Pradesh along with the measures taken by the Government to strengthen the said system;
- (b) whether the Government has undertaken measures to improve impact-based forecasting and timely dissemination of early warnings to States, disaster management authorities, farmers and vulnerable communities and if so, the details thereof, State/UT-wise including Bulandshahr district of Uttar Pradesh and Amalapuram Lok Sabha Constituency of Andhra Pradesh;
- (c) whether the Government has taken initiatives to strengthen last-mile delivery of weather advisories through mobile applications, SMS alerts, digital platforms and community-based warning systems and if so, the details thereof, State/UT-wise including Bulandshahr district of Uttar Pradesh and Amalapuram Lok Sabha constituency of Andhra Pradesh;
- (d) whether the Government has established a roadmap for expanding the coverage, accuracy and effectiveness of MHEWS particularly in disaster-prone regions and has assessed its impact on reducing loss of life and property and if so, the details thereof, State/UT-wise including Bulandshahr district of Uttar Pradesh and Amalapuram Lok Sabha constituency of Andhra Pradesh;
- (e) whether the Government proposes to further strengthen MHEWS through advanced forecasting technologies, AI-enabled weather prediction and enhanced coordination with States for improving disaster preparedness and climate resilience and if so, the details thereof; and
- (f) the details of financial and technical assistance provided by the Central Government to State Governments for strengthening MHEWS during the last three years particularly to Uttar Pradesh and Andhra Pradesh, year-wise?

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

(a) to (f): A Statement is laid on the Table of the House.

STATEMENT LAID ON THE TABLE OF THE LOK SABHA IN REPLY TO (a) to (f) OF
STARRED QUESTION NO. *353 REGARDING "STRENGTHENING MULTI-HAZARD
EARLY WARNING SYSTEMS" TO BE ANSWERED ON AUGUST 12, 2026

- (a) Yes. The Government of India through MoES institutions and India Meteorological Department (IMD) has undertaken continuous monitoring & rigorous review about implementation and effectiveness of Multi-Hazard Early Warning System (MHEWS) for disaster risk reduction measures for various hydrometeorological hazards e.g. cyclones, floods, heatwaves, coldwaves, thunderstorms, lightning and other extreme weather events in different states of the country including that of Bulandshahr district of Uttar Pradesh and Amalapuram Lok Sabha constituency of Andhra Pradesh. As an initiative towards the modernisation of operational meteorological services, including MHEWS at par with global standards, the IMD is following a seamless forecast strategy, covering all temporal and spatial scales. There has been tremendous progress in modernising the national, regional, and local meteorological early-warning system in the recent past, with the implementation of the Multi-Hazard Early Warning System of IMD with a state-of-the-art suite of GIS-enabled Decision Support System with the objective of 'No Weather should go Undetected and Unpredicted'. In order to cater the needs of the seamless forecasting IMD regularly issues seasonal outlook for rainfall as well as maximum and minimum temperatures heat waves and cold waves at regional scale; followed by monthly outlook, weekly extended range forecast for two weeks at zonal/sub-divisional scale; followed by daily short to medium range weather forecast for a week at district/sub-district scale and sub-daily nowcasts at hyperlocal level to enable various stakeholders, disaster managers and administrative authorities to enable preparedness, response-mechanism and plan for actions to mitigate multi-hazard risk appropriately.

The Multi-Hazard Early Warning Decision Support System (MHEW-DSS) is a state-of-the-art application developed in-house by IMD under the Mission Mausam initiative. It is a web-GIS-based digital platform designed to generate weather forecasts, handle large volumes of meteorological data, and deliver timely weather alerts. By integrating real-time observations, advanced modeling, GIS-based analysis, and structured dissemination within a single digital framework, the system converts weather and climate information into timely, preventive action. As part of this system, several sector-specific geospatial applications have been developed. One such application, Mausamgram, enables the last-mile dissemination of hyper-local weather forecasts, ensuring that vital weather information effectively reaches citizens and weather-dependent sectors. The MHEW-DSS has strengthened preparedness across the environment, energy, health, agriculture, livelihoods, and governance. It has reduced loss of life, limited economic damage, improved service delivery, and enhanced public trust through consistent and impact-focused warnings. The MHEW-DSS represents a decisive transformation in India's approach to weather forecasting and disaster risk reduction. The system demonstrates how technology-driven early warning delivers measurable public value at the national scale and positions India as a global leader in multi-hazard early warning systems.

At the national level, MHEW-DSS has significantly enhanced disaster preparedness and response mechanisms. Currently, more than 200 organizations, including the National Disaster Management Authority (NDMA), the National Disaster Response Force (NDRF), and State Disaster Management Authorities (SDMA), are benefiting from this system. The system enables timely forecasts and impact-based warnings, while also supporting sectoral stakeholders—such as urban planning agencies, power utilities, health services, and aviation—with actionable weather intelligence for improved decision-making.

- (b) Yes. The Government has significantly improved Impact-Based Forecasting (IBF) by shifting from weather forecasts to impact-based forecasts & risk-based warnings introduced at the district level since 2019 that indicate expected impacts on life, property, agriculture, infrastructure, transport, and essential services, along with recommended response actions. MoES, through IMD, provides these severe weather forecasts and warnings to the Central Government Ministries/Departments such as the Ministry of Home Affairs, Ministry of Agriculture and Farmers Welfare, Power and Health Ministries, etc., State Governments & Disaster Management Authorities at both Central and State Government agencies through e-mail, APIs & digital dissemination channels. At the national level, MHEW-DSS has significantly enhanced disaster preparedness and response mechanisms. Currently, more than 200 organizations, including the NDMA, the National Disaster Response Force (NDRF), and SDMA, are benefiting from this system. The system enables timely forecasts and impact-based warnings, while also supporting sectoral stakeholders, such as urban planning agencies, power utilities, health services, and aviation, with actionable weather intelligence for improved decision-making. MoES regularly participates in meetings conducted by PMO, MHA, and MoAFW, and provides relevant inputs. Under the crop weather watch of MoAFW every week, IMD provides the past rainfall and forecast of rainfall for the next two weeks. IMD also provides observed rainfall at district and block levels to all stakeholders across the country. During heatwaves, dry spells, heavy rainfall, cyclones, and other extreme weather events, IMD issues Impact-Based Forecasts (IBFs) and crop-specific advisories to support timely farm-level decision making and minimise crop losses.
- (c) Yes. The Government has taken several initiatives to strengthen the last-mile dissemination of early warnings. IMD implements the Gramin Krishi Mausam Sewa (GKMS) in collaboration with 55 Host Institutes, including the Indian Council of Agricultural Research (ICAR) institutes, State Agricultural Universities (SAUs), Indian Institutes of Technology (IITs), and other institutions. Under the scheme, 130 Agrometeorological Field Units (AMFUs) covering 127 agro-climatic zones issue district-specific agrometeorological advisories twice (Tuesday and Friday) a week and daily weather warnings based on IMD's medium-range weather forecasts and communicate to the farmers. Under the GKMS scheme, all agriculturally important districts are covered across the country, including Uttar Pradesh and Andhra Pradesh, for providing real-time weather forecasts, agromet advisories, and early warnings directly to farmers. In addition, IMD issues district-level impact-based weather forecast & risk-based warning valid up to 7 days through Regional Meteorological Centres & Meteorological Centres for their concerned States, including Uttar Pradesh and Andhra Pradesh, twice daily. These warnings are issued more frequently in case of severe

weather like cyclones. In addition, the block-level forecasts valid up to 5 days are also issued daily. To enhance the dissemination of real-time weather advisories to farmers, fishermen, coastal communities, etc., across the country to improve disaster preparedness and climate resilience, the following steps have been taken by IMD:

- Public Alerts and Information through MAUSAM, Meghdoot, DAMINI, and UMANG mobile apps.
- Digital Dissemination Channels, SMS-based nowcasting/forecasting alerts to registered users
- Common Alerting Protocol (CAP), SACHET App
- Social Media and mass media platforms
- District Collectors — direct e-mail and WhatsApp group notifications
- Broadcast through community radio, public broadcasting systems, and other local communication networks.
- Dissemination through the State Government Mobile app.
- Weather forecasts/warnings and advisories are disseminated through print and electronic media, Doordarshan, All India Radio, SMS through Kisan Portal/mKisan, Meghdoot (available in English and 12 Indian languages), Mausam, YouTube, and social media.
- In collaboration with the Ministry of Panchayati Raj, IMD has developed the Panchayat Mausam Seva Portal, providing Panchayat-level weather forecasts through e-GramSwaraj, Meri Panchayat App, e-Manchitra, and Mausamgram.
- The mobile numbers of Panchayat Members, Ward Members, and Panchayat Secretaries have been integrated with the Panchayat Mausam Seva Portal, enabling the timely dissemination of weather forecasts and agrometeorological advisories through WhatsApp for further dissemination at the Gram Panchayat level.
- IMD also leverages the Krishi Sakhis and Pashu Sakhis network of the Ministry of Rural Development for last-mile dissemination of weather forecasts and agrometeorological advisories.
- Social media like 'WhatsApp' is also used for quicker dissemination of weather forecasts and agromet advisories. WhatsApp groups of farmers have been created by various AMFUs to disseminate agromet services.
- Under Mission Mausam, IMD has developed KALP (Krishi Advisory based on Location-specific Weather Prediction) for the generation of location-, crop- and crop-stage-specific advisories and Mausam SANKALP (Systematic Agrometeorological aNalytics, Knowledge and Advisory enabLing Platform) to strengthen weather analytics, advisory generation and climate-resilient agricultural planning.

(d)-(e) Yes. The Government has developed a roadmap for continuously enhancing the coverage, accuracy, and effectiveness of MHEWS. Mission Mausam has been conceptualised as a transformative, outcome-oriented national initiative to enhance observational networks, improve weather forecasting, early warning services, and disaster preparedness. The India Meteorological Department monitors long-term changes in meteorological parameters over the country, including Uttar Pradesh and Andhra Pradesh. As a part of weather and climate services, IMD has prepared a Web version of the Climate Hazards and Vulnerability Atlas of India for the most hazardous

meteorological events, such as cyclones, extreme rainfall, heatwaves, coldwaves, lightning, etc., that cause loss of life, injury or other health impacts, property damage, loss of livelihoods and services, social and economic disruption or environmental damage. The web atlas is depicted using Geographic Information System (GIS) tools and is available on the IMD, Pune website (<https://www.imdpune.gov.in/hazardatlas/index.html>). The atlas provides district maps of hazard events and vulnerability for all calendar months and at the annual scale.

The Ministry is in continuous endeavour of augmenting the observational network comprising surface and upper-air systems, satellite monitoring, high-resolution dynamical models, data assimilation techniques, and research and development infrastructure, towards achieving better accuracy in weather and ocean-state forecasting, and strengthening timely early warning systems. The Ministry of Earth Sciences and its institutions regularly conduct awareness programs for State and Union Territory Governments and community-based initiatives to enhance disaster preparedness for weather- and climate-related hazards. The Ministry regularly engages with the National Disaster Management Authority, local management authorities, and other stakeholders to discuss pre-season disaster preparedness, safety procedures, and action plans in advance of severe weather seasons. These interactions cover tropical cyclone periods (April–June and October–November), the summer season and extreme-temperature conditions (April–June), and monsoonal heavy rainfall preparedness (June–December) each year. Weather forecasts for the country, including Uttar Pradesh and Andhra Pradesh, are issued by the IMD through its operational forecasting centers. The Mausamgram platform (mausamgram.imd.gov.in) is IMD's specialized weather interface at the panchayat level, designed for farmers. It offers hourly, 3-hourly, and 6-hourly forecasts for the upcoming ten days. Users can access real-time data on temperature, wind speed, cloud cover, rainfall, and humidity specific to the Gram Panchayat level.

- (f) The Ministry of Earth Sciences implements Central Sector Schemes uniformly across the country; therefore, funds are not allocated on a State/UT-wise basis.
