

**GOVERNMENT OF INDIA
MINISTRY OF EARTH SCIENCES
LOK SABHA
UNSTARRED QUESTION NO. 4090
TO BE ANSWERED ON WEDNESDAY, 12TH AUGUST, 2026**

STATUS OF EARLY WARNING SYSTEMS

4090. SHRI BALRAM NAIK PORIKA:

Will the Minister of EARTH SCIENCES be pleased to state:

- (a) the current status of country's early warning systems for cyclones, tsunamis and floods;
- (b) the details of ongoing research on climate change impacts on the Himalayan and coastal regions;
- (c) the steps taken to strengthen the seismological monitoring network in earthquake-prone zones; and
- (d) the details of outlay proposed for polar and ocean research expeditions during the current financial year?

ANSWER

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

- (a) Under Mission Mausam, the India Meteorological Department has strengthened its observational network with 50 Doppler Weather Radars, 1,008 Automatic Weather Stations, and 6,885 rain gauge stations nationwide. These advancements have improved severe weather forecast accuracy by 40–50% over the past decade, significantly reducing cyclone track, landfall, and intensity errors. For flood monitoring, 25 Flood Meteorological Offices issue daily 7-day Quantitative Precipitation Forecasts across 220 sub-basins to assist the Central Water Commission, alongside operational integrated flood warning systems in Chennai and Mumbai.

Additionally, INCOIS acts as the designated Tsunami Service Provider for 28 Indian Ocean Rim nations, using real-time ocean observations and multi-channel dissemination platforms like *SACHET* and the *SAMUDRA* app to issue alerts. Through the UNESCO-IOC Tsunami Ready Recognition Programme, 26 coastal villages in Odisha have already been recognized for local preparedness.

The Multi-Hazard Early Warning- Decision Support System (MHEW-DSS) is an advanced digital forecasting platform developed by the India Meteorological Department (IMD), under the Ministry of Earth Sciences (MoES), using open-source technology and in-house expertise. Introduced as a landmark digital transformation initiative under Mission Mausam, the system strengthens India's real-time weather monitoring and early warning capabilities. The MHEW-DSS reflects the Government of India's vision of a "Weather Ready and Climate Smart Nation" and embodies the philosophy of "Har Har Mausam, Har Ghar Mausam," ensuring that timely and actionable weather information reaches every household, sector, and region.

- (b) Climate research in the Himalayan region focuses on cascading hazards, glaciology, and hydrological dynamics. NCESS leads flood and hydrological modelling for Garhwal Himalaya hazard studies, while NCPOR conducts long-term monitoring of eight benchmark glaciers across Himachal Pradesh and Arunachal Pradesh from its high-altitude 'Himansh' research station at 4,080 meters. In coastal zones, INCOIS research under the Deep Ocean Mission projects mean sea-level rise along the Indian coastline between 0.62 meters and 0.87 meters by 2100 under a high-emission scenario. Meanwhile, NIOT maintains an extensive ocean observational network consisting of OMNI moored buoys, coastal HF radars, and tsunami buoys. These field efforts are complemented by MoES policy publications and IMD's GIS-based web Climate Hazards and Vulnerability Atlas of India.

The Indian Institute of Tropical Meteorology (IITM), Pune, under its ongoing project "Metropolitan Air Quality and Weather Forecasting Services (MAQWFS)", is conducting an integrated atmospheric and cryospheric observational experiment over the Gangotri–Gaumukh and Satopanth Glaciers. As part of the Glacier Expedition, IITM under the Ministry of Earth Sciences (MoES) has undertaken mobile atmospheric observations along the Gangotri–Gaumukh–Tapovan transect and established a continuous monitoring station at Bhojbasa, located at approximately 3,500 metres above mean sea level. These observations are aimed at improving the understanding of atmospheric processes and their interactions with the cryosphere in the Himalayan region.

- (c) The National Center for Seismology under the Ministry of Earth Sciences has significantly expanded the National Seismological Network from 86 observatories in 2014 to 174 active observatories across the country. To prioritize high-hazard areas, 89 of these observatories are strategically placed within high-risk Seismic Zones IV and V. This continuous real-time monitoring capability has successfully lowered the nationwide earthquake detection threshold to Magnitude 3.0, with an enhanced threshold of Magnitude 2.5 achieved for Delhi-NCR and the North-Eastern regions.
- (d) For the current financial year 2026–27, the proposed budget allocation for the National Centre for Polar and Ocean Research under the Polar Science and Cryosphere Research (PACER) scheme stands at ₹270.00 crore.
