GOVERNMENT OF INDIA
MINISTRY OF EARTH SCIENCES
LOK SABHA
UNSTARRED QUESTION NO. 3108
TO BE ANSWERED ON WEDNESDAY, 11TH MARCH, 2026

MISSION MAUSAM IN ODISHA

3108. SHRI BAIJAYANT PANDA:

Will the Minister of EARTH SCIENCES be pleased to state:

(a) whether Mission Mausam has improved accuracy and lead time of cyclone and extreme rainfall forecasts for coastal districts particularly in Odisha;
(b) whether the data indicates reduction in loss of life and improved evacuation efficiency during recent cyclonic events and if so, the details thereof; and
(c) the details of additional forecasting and observational infrastructure proposed to be deployed particularly in Odisha?

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

(a) Yes Sir. Various modernization projects and implementation of new initiatives such as Mission Mausam have significantly contributed to improving the accuracy and lead time of cyclone and extreme rainfall forecasts for coastal districts, including those in Odisha. Mission Mausam, implemented since late 2024 by subsuming the erstwhile ACROSS scheme, has strengthened monitoring and early warning systems and enhanced the observational network and modelling capabilities of the Ministry of Earth Sciences (MoES), the India Meteorological Department (IMD), and other sister organizations.

A comparative analysis of operational forecast accuracy of cyclone track, landfall point and intensity during 2021–2025 vis-à-vis 2016–2020 indicates notable improvements:

- Landfall point forecast error for 24, 48 and 72 hours lead periods during 2021–25 were 19.0 km, 34.4 km and 77.3 km respectively, compared to 31.9 km, 61.5 km and 91.9 km during 2016–20, indicating an improvement of 35–45% for 24–48 hours lead period and about 20% improvement for 36–72 hours lead period.

- Average track forecast errors were 73 km, 116 km and 168 km during 2021–25 compared to 77 km, 117 km and 159 km during 2016–20 for 24, 48 and 72 hours lead periods respectively, showing 5–10% improvement up to 48 hours.

- Average absolute error in intensity forecast was 5.3 knots, 7.5 knots and 9.1 knots for 24, 48 and 72 hours during 2021–25 compared to 7.9 knots, 11.4 knots and 14.1 knots during 2016–20, reflecting 35–45% improvement up to 72 hours lead period.

- Further, the improvement in lead time is also evident. The landfall point forecast error of 32 km at 24 hours lead period during 2016–20 is comparable to 34 km at 48 hours lead period during 2021–25, indicating an improvement of about 24 hours in lead time for similar accuracy. Similarly, the intensity forecast error of 7.9 knots at 24 hours lead period during 2016–20 is comparable to 7.9 knots at about 60 hours lead period during 2021–25, indicating an improvement of about 36 hours in lead time.

- Similarly, the accuracy of heavy rainfall forecasts (up to five days) has improved. The average Probability of Detection (PoD) for the recent five years (2021–2025) is 0.79 for Day-1, compared to 0.74 during 2016–2020. For Day-2 to Day-5, PoD improved from 0.61 to 0.71 (for Day 2), 0.60 to 0.68 (for Day 3), 0.56 to 0.69 (for Day 4), and 0.57 to 0.63 (for Day 5) respectively.

(b) Yes Sir. Data indicates a significant reduction in loss of life during recent cyclonic events due to improved early warning lead preparedness by State Governments. Since 2010, there has been a substantial decline in cyclone-related fatalities.

For instance, in recent years:

- Cyclone Biparjoy (2023, Gujarat) – Zero deaths
- Cyclone Michaung (2023, Tamil Nadu & Andhra Pradesh) – 19 deaths
- Cyclone Dana (Odisha) – Zero deaths
- Cyclone Fengal (2024, Tamil Nadu) – 10 deaths
- Cyclone Montha (2025, Andhra Pradesh) – 8 deaths

These figures are significantly lower compared to the 1999 Odisha Super Cyclone, which resulted in thousands of fatalities. The reduction in casualties is primarily attributed to timely early warnings issued by IMD and effective evacuation measures undertaken by State Governments based on these forecasts.

(c) The India Meteorological Department (IMD) has been continuously strengthening forecasting and observational infrastructure across the country, including Odisha, through installation and upgradation of meteorological observation systems such as Automatic Weather Stations (AWS), Automated Rain Gauges (ARG), High Wind Speed Recorders (HWSR), and Doppler Weather Radars (DWRs).

At present, Odisha has:

- 39 manned surface meteorological observatories
- 29 Automatic Weather Stations (AWS)
- 136 Automated Rain Gauge (ARG) stations
- 6 High Wind Speed Recorders (HWSR)
- Current Weather Observation Systems at four airports
- Two Doppler Weather Radars at Paradip and Gopalpur, operating round the clock
- A Flood Meteorological Office (FMO) at IMD Bhubaneswar functioning round the clock
- A Cyclone Warning Centre at IMD Bhubaneswar

In addition to the existing network, the following infrastructure is proposed to be installed under Mission Mausam:

- Two C-Band Doppler Weather Radars at Sambalpur and Balasore by 2026
- One X-Band Doppler Weather Radar at Bhubaneswar
- One S-Band Doppler Weather Radar proposed at Puri

These additions will further strengthen cyclone monitoring, rainfall forecasting, and early warning capabilities for Odisha and the adjoining coastal regions.

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