

**GOVERNMENT OF INDIA  
MINISTRY OF EARTH SCIENCES  
LOK SABHA  
UNSTARRED QUESTION NO. 1693  
TO BE ANSWERED ON WEDNESDAY, 29<sup>TH</sup> JULY, 2026**

**DEPLOYMENT OF EMERGING OBSERVATION TECHNOLOGIES**

1693 SHRI PRADEEP PUROHIT:

Will the Minister of EARTH SCIENCES be pleased to state:

- (a) the details of new technologies such as floating LiDARs, marine radars, autonomous platforms and drones proposed to be deployed under Mission Mausam;
- (b) the details of proposed locations and timelines for deployment of such technologies, region-wise;
- (c) the details of investments made for deployment of these technologies during the last three years and the current year; and
- (d) the details of expected enhancement in atmospheric and oceanic data density and its impact on numerical weather prediction and climate services in the country?

**ANSWER**

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

- (a) Mission Mausam proposes to strengthen the atmospheric and oceanic observation network by deploying advanced observation technologies under the OBSERVE\_ALL vertical. The proposed technologies include next-generation Doppler Weather Radars, Doppler LiDARs, wind profilers, microwave radiometers, disdrometers, ceilometers, advanced upper-air observation systems, GNSS-CORS stations, marine observation systems, marine Automatic Weather Stations (AWS), moored buoy-based LiDAR and RADAR, autonomous ocean observation platforms, drones for atmospheric and ocean observations, phased-array radars, wave gliders, ocean gliders, met-ocean observatories and advanced polar observation systems. A floating LiDAR-based observatory has already been demonstrated through a short-duration trial, while sensor-equipped drones are being tested through field campaigns. These technologies are being developed and validated for phased deployment to improve weather forecasting, climate services and Earth system modelling.
- (b) These technologies are proposed to be deployed across the country in a phased manner during the XVI Finance Commission period (2026–31). Marine observation systems are proposed to be deployed in the Bay of Bengal, the Arabian Sea and the Indian Exclusive Economic Zone (EEZ). The exact locations and deployment schedule will depend on the type of observation system, the number of instruments proposed, operational requirements and site readiness.

- (c) The actual capital expenditure under Mission Mausam was ₹159.55 crore in 2024–25 and ₹173.38 crore in 2025–26. The capital expenditure under Mission Mausam is primarily towards creation and augmentation of weather observation infrastructure and related information and communication technology (ICT) infrastructure. Most of the advanced ocean observation systems are proposed for implementation during the XVI FC period (2026–31). During 2026–27, about ₹33 crore has been utilized by the National Institute of Ocean Technology (NIOT) towards preliminary activities for these technologies.
- (d) The proposed observational systems are expected to substantially improve the spatial and temporal density of atmospheric and oceanic observations, particularly over data-sparse regions. The enhanced observations will be assimilated into Numerical Weather Prediction (NWP) and Earth System Models to improve model initialization, forecast accuracy, nowcasting, impact-based forecasting, cyclone prediction, heavy rainfall and thunderstorm forecasts, and climate services, thereby strengthening disaster risk reduction and weather resilience across the country.

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