GOVERNMENT OF INDIA
MINISTRY OF EARTH SCIENCES
RAJYA SABHA
UNSTARRED QUESTION NO. 2288
ANSWERED ON 12/03/2026

STATUS OF IMPLEMENTATION OF MISSION MAUSAM

2288. # SHRI MAYANKKUMAR NAYAK:
DR. KAVITA PATIDAR:
SMT. KIRAN CHOUDHRY:
SMT. SEEMA DWIVEDI:
SHRI BABUBHAI JESANGBHAI DESAI:
DR. BHAGWAT KARAD:
SHRI CHUNNILAL GARASIYA:
SMT. MAYA NAROLIYA:
SHRI SUBHASH BARALA:

Will the Minister of **EARTH SCIENCES** be pleased to state:

(a) the progress made in the implementation of Mission Mausam, launched under IMD Vision 2047, with High Performance Computing (HPC) augmentation to 21 petaFlops for high-resolution weather forecasting, Al/ML integration and seamless services;
(b) the improvements in forecast accuracy for cyclones, monsoons and heatwaves and economic impact quantified,
(c) whether the Ministry has assessed public benefit and proposes phase-II expansion; and
(d) if so, the details thereof?

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

(a) Under Mission Mausam, the High-Performance Computing (HPC) systems of the Ministry of Earth Sciences were inaugurated on 26 September 2024 by the Hon'ble Prime Minister at the Indian Institute of Tropical Meteorology, Pune and the National Centre for Medium Range Weather Forecasting, Noida. The systems, named "ARKA" (computing capacity of 11.77 petaflops) and "ARUNIKA" (8.24 petaflops), along with a dedicated 1.9 petaflops AI/ML system, have increased the Ministry's total computing capacity to 21.91 petaflops. This enhanced computational infrastructure enables development of advanced high-resolution weather and climate models, and the application of Artificial Intelligence and Machine Learning for forecasting.

(b) IMD has achieved a significant leap in tropical cyclone forecasting accuracy during the 2021-2025 period compared to 2016-2020. Track forecast errors have been reduced by 5-10% for lead times up to 48 hours and by 20-25% for longer lead times. Intensity forecasting has also shown substantial improvement, with a 33-35% enhancement for

lead times up to 72 hours, while errors at the 96-hour lead time have decreased by 10%. The most pronounced improvement has been observed in landfall prediction, which is critical for timely coastal evacuations. Landfall point errors decreased by 35-45% for 24 to 48 hours and by about 20% for other lead periods. The average 24- hour landfall point error reduced from 31.9 km during 2016-20 to 19.0 km during 2021-25, while the 48-hour landfall error declined from 61.5 km to 34.4 km. Heatwave forecasts are now issued 4–5 days in advance, enabling effective implementation of heat action plans by State and district authorities. These improvements have resulted in significant socio-economic benefits, including timely evacuation during cyclones, better agricultural planning during the monsoon, and improved disaster preparedness, thereby reducing loss of life, property, and economic disruptions across multiple sectors.

(c) Yes. The Ministry of Earth Sciences (MoES) periodically evaluates the benefits of improvements in weather and climate services through impact assessments, verification of forecast skill scores, and feedback from user sectors such as agriculture, disaster management, aviation, fisheries, and energy. These assessments indicate that improved forecasting capabilities—implemented by institutions such as the India Meteorological Department, Indian Institute of Tropical Meteorology, and the National Centre for Medium Range Weather Forecasting—have resulted in significant public benefits, including better early warnings for cyclones, heatwaves, heavy rainfall, and other extreme weather events. The improvements have enabled timely evacuations, enhanced disaster preparedness, better agricultural decision-making, and reduced loss of life and property. Yes, the Ministry of Earth Sciences (MoES) is proposing the extension of Mission Mausam to Phase-II based on the progress achieved and the growing demand for improved weather and climate services.

(d) Further, Mission Mausam has been designed as a multi-phase programme. The Government proposes to continue and expand the initiative in subsequent phases based on the outcomes of the first phase. Several initiatives under the mission expected to improve our understanding of the complex weather processes. The proposed second phase will focus on further strengthening the national weather observation network, enhancing high-resolution weather and climate modelling capabilities using advanced High-Performance Computing, integrating Artificial Intelligence and Machine Learning in forecasting systems.

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