

**GOVERNMENT OF INDIA
MINISTRY OF EARTH SCIENCES
LOK SABHA
UNSTARRED QUESTION NO. 4271
TO BE ANSWERED ON WEDNESDAY, 18TH MARCH, 2026**

STRENGTHENING SUPERCOMPUTING CAPACITY

4271. SHRI DILESHWAR KAMAIT:

Will the Minister of EARTH SCIENCES be pleased to state:

- (a) whether the Government has augmented its High-Performance Computing (HPC) capacity during the last two years for weather, climate and ocean modelling;
- (b) if so, the details of supercomputing systems commissioned or upgraded including computing capacity and locations;
- (c) whether such augmentation has enabled higher-resolution and longer-lead forecasts; and
- (d) if so, the sectors that have directly benefited from these improvements?

ANSWER

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

- (a)-(b) Yes. The Ministry of Earth Sciences (MoES) has augmented its High Performance Computing (HPC) capabilities through the installation of two advanced systems—Arka at the Indian Institute of Tropical Meteorology (IITM) in Pune and Arunika at the National Centre for Medium Range Weather Forecasting (NCMRWF) in Noida. These systems were inaugurated by the Hon'ble Prime Minister, Shri Narendra Modi, on 26 September 2024.

The HPC system at IITM, Pune—named Arka—has a total capacity of 13.67 PetaFlops (PF). This includes 10.67 PF of compute capacity, 1.1 PF of GPU capability, and a dedicated 1.9 PF system for AI/ML applications. It is supported by a substantial 33 Petabyte (PB) storage infrastructure. The HPC system installed at NCMRWF, Noida—named Arunika —offers a total computing capacity of 8.24 PF and is equipped with a 24 PB storage system.

- (c)-(d) Yes. Augmenting the Arka and Arunika HPC's has enabled MoES to run the ~6.5 km global model (namely Bharat Forecasting System, BharatFS) on a daily basis for operational forecasting. The increase in computing capacity has enabled the deployment of the Bharat Forecast System model, the highest resolution global model running operationally anywhere in the world.

The BharatFS is based on the newly implemented Triangular Cubic Octahedral (TCO) dynamical grid, which enables the model to operate at ~6.5 km horizontal resolution. It has improved representation of orography, better filtering, and better conservation properties. With the increase in horizontal resolution, BharatFS can generate distinct forecasts every 6.5 km (10-day forecast). With the improved skill of BharatFS at such a high resolution, the model can provide better guidance for weather predictions and extremes at the district and block levels, which are typically 12 km or more.

In addition to BharatFS, the India Meteorological Department (IMD) is running various other global and regional numerical weather prediction models in HPCs to generate operational weather and climate forecasts at various spatial and temporal levels. These model forecasts are being widely used to generate alerts, warnings, and advisories in various weather and climate-sensitive sectors like agriculture, water, health, disaster management, energy, transport, etc.
