GOVERNMENT OF INDIA
MINISTRY OF EARTH SCIENCES
LOK SABHA
UNSTARRED QUESTION NO. 3082
TO BE ANSWERED ON WEDNESDAY, 11TH MARCH, 2026

AI IN WEATHER FORECASTING

3082. MS. S JOTHIMANI:
DR. ANAND KUMAR:

Will the Minister of EARTH SCIENCES be pleased to state:

(a) whether the Government is utilising Artificial Intelligence (AI) based technologies for forecasting weather conditions and seasonal changes and if so, the details thereof;
(b) the details of various efforts being made through new technologies, mobile applications and digital platforms to provide accurate and timely information regarding rainfall, cyclones, temperature variations and other climate conditions to farmers and fishermen;
(c) whether Artificial Intelligence and other related technologies are being upgraded to make weather forecasting more accurate and area-specific; and
(d) if so, the details and the current status thereof including the potential benefits expected to accrue to the farmers and if not, the reasons therefor?

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

(a) Yes. The India Meteorological Department (IMD), in coordination with various centers of MoES, is utilizing Artificial Intelligence (AI) technologies for developing weather forecasting tools. Some of these applications are listed below:

- Using AI/ML-based Advanced Dvorak Technique (AiDT) to estimate the intensity of cyclones.

- Utilizing AI/ML-based data-driven weather forecasting models such as the Pangu, GraphCast weather forecasting model, and FourCastNet for generating experimental weather forecasts.

- For weather conditions, AI supports nowcasting, bias correction, and hyper-local predictions, improving cyclone tracks and monsoon rainfall. Seasonal changes benefit from hybrid AI-physics ensembles for sub-seasonal to seasonal outlooks, incorporating ENSO-monsoon links and extended Indian Monsoon Data Assimilation and Analysis (IMDAA) reanalysis.

- National Centre for Medium Range Weather Forecasting (NCMRWF) integrates global AI foundation models, including Pangu-Weather, GraphCast, FourCastNet, and GenCast, on the Arunika supercomputer. These are initialized with outputs from NCMRWF's Mithuna-FS coupled model and used for rapid medium-range forecasts, probabilistic extremes (e.g., heavy rainfall, heatwaves), and downscaling to block-level resolution.

(b) - (d) IMD is using an AI/ML tool called "Bhashini" to disseminate the weather-related information to all farmers in their regional languages. The Government has taken various measures to extend real-time weather updates to rural farmers for better crop management. A weather-based crop advisory service is a step towards providing real-time information about weather updates, crop health, and appropriate measures to the farmers, enabling them to make informed decisions about various crop management practices leading to higher yields and increased income.

To provide real-time weather updates and early warnings directly to the mobile phones of the farmers from climate-vulnerable districts, weather forecasts and Agromet Advisories are disseminated through a real-time mechanism or multichannel dissemination system, including print and electronic media, Doordarshan, internet, and SMS under Public-Private Partnership (PPP) initiatives.

IMD, in collaboration with the Ministry of Panchayati Raj (MoPR), has recently launched Panchayat-level weather forecasts covering nearly all Gram Panchayats in India. These forecasts are accessible through digital platforms such as e-Gramswaraj (https://egramswaraj.gov.in), Meri Panchayat app, e-Manchitra of MoPR, and Mausamgram of IMD, MoES (https://mausamgram.imd.gov.in). IMD developed an AI/ML-based tool called meteoGAN to give area-specific rainfall information with 300-meter spatial resolution.

Technological advancements have enabled farmers to receive location-specific forecasts and agromet advisories through mobile apps such as 'Meghdoot' and 'Mausam', and Social media platforms like WhatsApp, Facebook, etc. Additionally, IMD has integrated its services with IT platforms of 21 State Governments, and about 15.6 million farmers are accessing information in English and regional languages from these State Government IT platforms.

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