

**GOVERNMENT OF INDIA
MINISTRY OF EARTH SCIENCES
LOK SABHA
UNSTARRED QUESTION NO. 5575
TO BE ANSWERED ON WEDNESDAY, 6TH APRIL, 2022**

AGRICULTURAL WEATHER FORECAST

5575. SHRI JANARDAN SINGH SIGRIWAL:

Will the Minister of EARTH SCIENCES be pleased to state:

- (a) whether the Government has taken any steps to strengthen the Agricultural Weather Forecast in the country to address the risk in agriculture sector and if so, the details thereof;
- (b) whether action has been taken by the Government for modernisation and development of devices and equipment for publicity of accurate and region specific agricultural weather information at district level; and
- (c) 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) IMD, Ministry of Earth Sciences (MoES) in collaboration with Indian Council of Agriculture Research (ICAR) and State Agriculture Universities (SAUs) and other institutions is rendering District/Block level Agrometeorological Advisory Services (AAS) for the benefits of farmers in the country under the scheme “GraminKrishiMausamSewa (GKMS)”. The main emphasis of AAS is to collect and organize climate/weather, soil and crop information, and to amalgamate them with weather forecast to assist farmers to take decisions on day-to-day farm operations, which can further optimize the application of input resources at farm level during deficient rainfall situation and extreme weather events to reduce monetary loss and to maximize crop yield.

The various developments in the field of Agrometeorological Advisory Service are summarized below.

- **District and Block level AAS Bulletins:**

5-day medium range weather forecast at district and block level is generated and based on the forecast, location-specific block and district level agromet advisories are presently prepared by the 130 Agromet Field Units (AMFUs) located in State Agricultural Universities, ICAR Institutes, IITs etc. and 199 District Agromet Units (DAMUs) at KrishiVigyanKendras (KVKs) under ICAR network and communicated to the farmers on every Tuesday and Friday. Presently agromet advisories are being prepared for around 3100 blocks. However, the daily weather forecast valid for next five days for all the Blocks of the country is being provided by IMD since 2021. Along with the biweekly bulletins, daily weather forecast and nowcast information are also disseminated to the farmers by Regional and State Meteorological centers of IMD.

- **Establishment of DAMUs:**

After successful implementation of District level AAS through the network of 130 AMFUs, Organizational setup of GKMS network is being augmented by establishing DAMUs in the premises of KVKs jointly by IMD and ICAR to prepare sub-district/block level advisory and to enhance the outreach of services. Two additional manpower, viz. one Subject Matter Specialist (Agrometeorology) and one Agromet Observer, are recruited at each KVK to take care of activities of DAMU. Expert panel is constituted at each DAMUs consisting of experts of KVK and district level agriculture officer to prepare the weather based advisory for the farmers, utilizing the past, present and forecast weather information; location specific knowledge; and satellite-based information. As on date, 199 DAMUs have been established and block AAS have been rolled out to the farmers at micro-level.

- **Installation of Agro-AWS:**

One Agro-AWS is being installed at each newly established DAMU to record the changes in weather parameters. 200 of these Agro-AWSs are under the process of installation at present (198 Agro-AWSs have already been installed); and the process for another set of 330 Agro-AWSs is in an advance stage of procurement. The Agro-AWSs also have soil moisture and soil temperature sensors up to one meter depth, as these parameters are very important for decision making in farm level risk management. It will fulfill the requirement of the country to have a benchmark district network of soil moisture and soil temperature observations in the country.

- **Generation of Agromet Products:**

Generation of Agromet advisories based on realized and forecast weather and crop state and stage is always difficult. In view of enhancing the analytical ability of the scientists / experts, it is required to develop / generate and use various agromet products utilizing different weather, crop and satellite data available on real time basis.

In view of above, the agromet products like spatial distribution of weather parameters, maps on Normalised Difference Vegetation Index (NDVI), Vegetation Condition Index (VCI), Temperature Condition Index (TCI), Standardized Precipitation Index (SPI) etc. are generated on daily and weekly basis and communicated to AMFUs and DAMUs to facilitate preparation of more appropriate Agromet advisories.

- **Agromet Decision Support System (<https://agromet.imd.gov.in>):**

A dedicated portal 'Agromet DSS' has been developed to make seamless data & information exchange among concerned organizations in a more objective, timely, transparent and effective manner leading to improvement in the quality of services. Agromet-DSS facilitates the scientists / institutions with customised tools to integrate weather and crop information to prepare agromet advisories at finer scales in short time to serve farming community at micro level.

- **Real-time monitoring dashboard (<https://imdagrmet.gov.in/>):**

IMD has also developed 'Real Time Monitoring Dashboard' for monitoring the preparation of Agromet advisory Bulletins at district and block level and also the Farmers Awareness Programmes (FAPs) conducted by each DAMU.

- **Inception of new techniques and tools:**

- Nowcast (up to 3 hours), medium range forecast (up to 5 days) and extended range forecast based advisory with a lead period of 15 days are provided to farmers and planners at central and state level.
- Introduced very short range forecast for severe weather event like thunderstorm, lightning etc.; special advisories are disseminated through mKisan portal and other social media.
- Enhanced National collaboration for research & development and outreach of agromet advisories.
- Introduction of Satellite based products as additional tools for decision making by the Agromet Experts.
- Development of dynamic feedback - real time weekly / fortnightly and end-of-season.
- Online reception of weather data from manual agromet observatory in near real time.

- **Outreach and Dissemination:**

Agromet Advisories are disseminated to the farmers through multichannel dissemination system like print and electronic media, Door Darshan, radio, internet etc. including SMS using mobile phones through Kisan Portal and also through private companies under Public Private Partnership (PPP) mode. SMS to the farmers through private companies is continued.

Apart from issuing district and block level agromet advisories, Impact Based Forecasts (IBF) for extreme weather events detrimental to crops along with possible measures are being issued for various districts in different states as and when situation arises. The weather warnings for heavy rainfall, hail storm, cold wave, frost, heat wave, high wind etc. at district level are issued by the concerned RMCs and MCs of the respective states and accordingly the appropriate farm operations to save the crops are prepared by AMFUs and DAMUs. The consolidated IBF is prepared by the RMCs and MCs of IMD and disseminated to the district collectors and Agricultural officers of the concerned districts.

Social media is also used for quicker dissemination of forecast and advisories to the farmers. At present farmers of 1,164,27 villages in 3505 Blocks have been covered through 15240 WhatsApp groups. State Agriculture Department officials of District and Block level are also included in these WhatsApp groups. Agromet advisories are also communicated through YouTube Channel by AMFUs and DAMUs across the country. Farmers feedback are also being collected and uploaded in YouTube Channel. In addition, advisories are also being circulated through a number of Facebook pages created by AMFUs and DAMUs. Initiative on collaboration with State Government has been taken up for integration of weather forecast and Agromet advisories with state government mobile apps and websites. The integration has been completed for Bihar, Chhattisgarh, Gujarat, Haryana, Madhya Pradesh, Nagaland, Rajasthan and Tamil Nadu states and about 6.2 million farmers of above-mentioned states are getting benefitted from weather forecast and agromet advisories.

With the advancement of ICT, Farmers access the weather information including alerts and related agromet advisories specific to their districts through the mobile App viz., 'Meghdoot' launched by Ministry of Earth Sciences, Government of India. These weather details are also accessible by farmers through another App 'KisanSuvidha', launched by Ministry of Agriculture & Farmers Welfare. Also, a few AMFUs have developed mobile Apps to facilitate quick dissemination of agromet advisories to the farmers of their region.

IMD is taking continuous efforts to popularize the services among the farming community by organising Farmers' Awareness Programmes (FAPs) in collaboration with AMFUs and DAMUs in various parts of the country. IMD along with the experts from AMFUs and DAMUs also participate in KisanMelas, Farmers' Day etc. to create awareness about the services, so that more farmers get benefitted.

(b)-(c) For modernization, expansion and improvement in Weather & Climate services, various plans are underway in IMD under the umbrella Central Sector Scheme ACROSS. There are 4 sub-schemes of IMD under ACROSS namely, Atmospheric Observation Network (AON), Upgradation of Forecast System (UFS), Weather & Climate Services (WCS) and Commissioning of Polarimetric Doppler Weather Radars (DWR). Main activities of these sub-schemes are as follows:

Atmospheric Observations Network (AON)

- Sustenance and Augmentation of observational networks comprising of Doppler Weather Radars (DWRs), Automatic Rain Gauges (ARGs), Automatic Weather Stations (AWSs), Upper Air, Surface and Environmental Observatories etc. . Improve upon the spatial and temporal density of Radar observational network, particularly over the regions with large data gaps in the country.

- To improve and upgrade weather and climate services over north-eastern region by establishing additional state of art surface and upper air observatories for real time observations.
- Sustenance & Establishment of Multi processing, computing and communication facilities for Satellite Meteorological Applications.

Upgradation of Forecast System (UFS)

- Upgradation and sustenance of Communication Systems for Data and Product transmission.
- Development of an advanced Operational Forecast System, Delivery System for Forecast and other services.
- Conduct of special campaign for improving Cyclone, Thunderstorm and Fog forecasting through provision of additional observations.
- Integrated Himalayan Meteorological Programme for Western & Central Himalayas.
- Capacity Building, Outreach, Planning and sustenance of specific process related observing systems over India.

Weather & Climate Services (WCS)

- Setting up of District Agro-Met Units (DAMUs) at all the districts complementarily with existing AMFUs in the country for extension of Agromet Advisory Services (AAS).
- Major upgradation of Meteorological facilities at all airports through commissioning of State-of-art Integrated Aviation Weather Observing Systems (AWOS), HAWOS, Microwave Radiometers, Doppler LIDARs, Wind Profilers etc to support Aeronautical MET Services.
- Establishment of a state-of the-art Climate Data Centre with integrated advanced Climate Data Services portal for rendering national and regional climate services.
- To upgrade the training infrastructure and facilities to enhance the capacity of the training establishment.

Commissioning of Polarimetric Doppler Weather Radars (PDWR)

The scheme “Commissioning of Polarimetric Doppler Weather Radars (DWRs)” is aimed at augmenting the DWR network over the country to facilitate plugging the existing gaps in the meteorological observational network of radars for most parts of the country, through installation of eleven C-Band dual polarized DWRs.

Major progress already made under this scheme with respect to Agricultural Weather Services follow:

- About 198 Agro-AWS have been installed at District Agromet Units (DAMUs) in KrishiVigyanKendras (KVKs) premises which have soil moisture and soil temperature sensors additionally.
- Experimental block level agromet advisories are issued for ~3000 blocks covering ~355 districts of the country at present. Issuance of Block level weather forecast and Agromet Advisory Service Bulletins is expected to increase to 5000 blocks in 2022 and uptopanchayat level by 2024.
