

GOVERNMENT OF INDIA
MINISTRY OF EARTH SCIENCES
RAJYA SABHA
UNSTARRED QUESTION No. 3223
TO BE ANSWERED ON 31st March 2022

WEATHER FORECASTING TECHNOLOGY/ EQUIPMENT IN TAMILNADU

3223. SHRI P.WILSON :

Will the Minister of EARTH SCIENCES be pleased to state:

- (a) whether there is any proposal for upgradation of weather forecasting technology/equipment for more accurate prediction under the Atmosphere and Climate Research-Modelling Observing System and Services (ACROSS) Scheme especially in Tamil Nadu as the conditions of radars used in the meteorological department at Chennai and Karaikal are bad and failed to accurately predict the rainfall in November 2021;
- (b) whether Government has data as to the number of people that have been employed as science and technological staff under the ACROSS Scheme across the country but especially in Tamil Nadu; and
- (c) if so, the details thereof, 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) The details of Automated Cargo Release and Operations Service System Scheme (ACROSS) are not available with the ministry. However, the Ministry is implementing the umbrella scheme “Atmosphere & Climate Research-Modelling Observing Systems & Services (ACROSS)” in order to enhance the weather monitoring and forecasting capabilities of the country including capacity building and upgradation of technology. There are 4 sub-schemes being implemented by the India Meteorological Department (IMD) under the ACROSS scheme 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 complimentary 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.

No state-specific central sector scheme is under implementation by MoES.

Major progress already made under ACROSS-IMD follow:

- IMD’s DWR network has expanded to 33 DWRs (including DWRs from ISRO) across the country to support monitoring & forecasting of severe weather like thunderstorm, hailstorm, lightning, squall, heavy rain and cyclone etc.
- The network of upper air observatories has been enhanced and it comprise of 56 Radiosonde/Radiowind and 62 Pilot balloon observatories at present to measure the vertical profile of meteorological elements viz., temperature, wind and humidity.
- IMD maintains 216 Surface Observatories, 918 Automatic Weather Stations (AWS) Network (inclusive of 198 Agro-AWS) and 1382 Automatic Rain Gauge Stations (ARG) Network and 34 High Wind Speed Recording systems along east and west coast.

- Satellite derived products are augmented with establishment of Multi Mission Data Receiving and Processing System.
- Installation of Frangible mast, Current Weather Instrument System (CWIS) and PC based display completed at 39 airports.
- Advance observing systems such as Wind Lidar/Wind Profiler and Microwave Radiometers to detect and nowcast aviation hazards & weather extremes e.g., thick fog, gust wind etc. and facilitate more precise management of take-off and landing operations to be introduced at major airports.
- About 198 Agro-AWS have been installed at District Agromet Units (DAMUs) in Krishi Vigyan Kendras (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.
- Mausam and Meghdoot mobile apps launched. Using this App, farmers can get Weather observations and forecast, Weather based crop and livestock-specific agrometeorological advisories in English and regional language for their districts.
- Noteworthy improvement has been made in track and intensity forecast of the tropical cyclones, due to which the loss of life due to Tropical Cyclones has been reduced significantly to less than 100 during recent cyclones.
- High Resolution Rapid Refresh (HRRR) model is operationalized in experimental mode for three domains (Northwest India, East & North-East India and South Peninsular India) covering the entire mainland of India. HRRR model is run with Radar Data Assimilation at 2km horizontal resolution to provide Nowcast guidance and produce hourly forecast products for next 12 hours.
- Location specific Meteograms for 751 districts and 658 stations of India and 491 stations of SAARC countries, 1000 National Agriculture Market (eNAM), 7000 Blocks are generated along with all meteorological Sub-Division based forecasts.
- Different customized post-processed products based on NWP models are being generated specifically for different sectorial applications including hydrology, health, environment, transport, power, agriculture, cyclone, thunderstorm, heat/cold wave, fog etc.
- Web GIS Portal has been developed for real time monitoring and forecasting of severe weather events like cyclone, heat wave, cold wave and heavy rainfall.
- For capacity building, several trainings, workshops, seminars etc. are organized on a regular basis.

The intense rainfall activity observed over Chennai and other districts of Tamil Nadu had been due to favourable synoptic conditions like low pressure systems, cyclonic circulations, etc. affecting the state. All these intense rainfall activities had been predicted and all concerned had been informed suitably to support mitigation measures.

For monitoring of severe weather, there are two S-band DWR at Chennai and Karaikal and one X-band DWR [developed by Indian Space Research Organisation (ISRO)] at Pallikarnai, Chennai.

Regarding Chennai Radar and its role in accurate prediction of rainfall, the following points are brought forward:

- The Doppler Weather Radar (S-band) imported from Germany was installed at the Port Trust Centenary building in Chennai in the year 2002. It has served more than 18 years providing round

the clock operations. For the past one year, it is facing problems in the antennae system due to wear and tear of the mechanical systems, in gears and bearing in the pedestal.

- Spare parts of the antennae system are not available with the OEM since the model is phased out. With the help of ISRO, the roller bearings have been replaced now. The refurbished parts have now enables the radar to be made functional for few hours, and not for round-the-clock operations. Hence, this radar is now being operated whenever cyclone is to be tracked and/ or on need-basis. In order to work round-the-clock, we need to repair the gear parts as well, and efforts are underway to design and fabricate such gear box with the help from ISRO.
- The partially functional S-band radar installed on the Port Trust building of Chennai, or even its absence, will in no way hamper the forecasting capabilities of IMD since: (i) the new X-band Doppler Weather Radar installed at NIOT, Chennai (under the Make in India initiative) is fully functional and provides weather information round-the-clock; (ii) the Doppler Weather Radars at Sriharikota (which is around 50 kms from Chennai) and at Karaikal are also providing weather information round-the-clock over this area; and (iii) satellites are also providing valuable data over this area.

Thus, the forecasting activities of IMD are not hampered due to the lowered operations of the S-band radar at Chennai.

The notion that radar only generates weather forecasts, and it along is responsible for weather forecasts, is factually not correct. Valuable inputs from satellites and other in-situ observations are used in numerical weather prediction models for nowcast and forecast.

(b) - (c) ACROSS scheme is a central sector scheme being implemented by MoES for the country as a whole through the following institutions : India Meteorological Department, National Centre for Medium Range Weather Forecasting, Noida and Indian Institute of Tropical Meteorology, Pune. The total staff strength (which includes both scientific and technical) of all these institutions are given below :

Group A – 759
Group B – 3844
Group C - 2827

The details of scientific and technological staff employed by IMD in different offices in Tamil Nadu are given below:

Group A – 11
Group B (Gazetted) – 56
Group B (Non-Gazetted) – 115
Group C - 58

However, it is mentioned that no state specific staff recruitment had been carried out by MoES/IMD under the scheme.
