

# PARLIAMENT QUESTION: THIRD GENERATION METEOROLOGICAL SATELLITE

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The Ministry of Earth Sciences (MoES) has allocated Rs. 480/- crore and billed for the launch of the Indian National Satellite (INSAT-3DS).

Currently, INSAT-3DS, along with INSAT-3DR, are in use for operational weather services, and some of the important applications of its products are:

- Round-the-clock monitoring of severe weather conditions with rapid scan capability. Satellite images are generated every 5 minutes for the area of interest (where the severe weather is prevailing).
- A satellite visualization tool known as Real-time Analysis of Products and Information Dissemination (RAPID) to visualize and analyze satellite images and derived products as per the user's choice (<https://rapid.imd.gov.in/r2v/>).
- Numerous satellite-derived products and imageries are generated at each 30-minute gap, which is very useful in real-time monitoring the cyclone activity and determination of cyclone track and intensity.
- During pre-monsoon season thunderstorms and lightning season of March to May, various products like Outgoing Longwave Radiation, Quantitative Precipitation Estimate, Sea Surface Temperature, Insolation, winds, winds derived products, etc. and Temperature, Humidity profiles/Thermodynamic indices etc.) are used for monitoring the movement of convective weather systems.
- Satellite-derived products are also helpful in monitoring the onset, active, and withdrawal phases of southwest and northeast monsoons. It is also used to monitor and analyse the origin, movement, and possible impact of Western disturbance moving across North India.
- Data Collection and Dissemination: The satellite's data relay transponder facilitates efficient collection and distribution of meteorological, hydrological, and oceanographic data from various ground stations, supporting The India Meteorological Department (IMD).
- Search and Rescue Operations: The satellite has a dedicated search and rescue payload that assists in locating and saving lives during maritime and aviation emergencies. These advancements in INSAT-3DS have strengthened India's capacity to monitor and predict weather patterns, enabling better preparedness for extreme weather events and contributing to improving agricultural and water management decisions.
- Meteorological data and products from both the INSATs are also useful in various sectors in real-time:
  - Aviation Meteorological services (root forecast, convection cloud development, movement, etc.)
  - Marine weather forecast (convection movements, high /low-pressure zones, winds convergence, divergence, etc.)
  - Power Sector (clouds, convection, etc.)
  - Tourism sector (root, temperature, clouds, dry or moist areas, winds, circulation, etc.)
  - Monitoring severe weather phenomena like intense rainfall episodes, heatwave conditions, cold wave day and night fog, etc.) are easily monitored over the Indian region/neighbouring countries

by day and night (24-hour) coverage of satellite data.

- Special sector images are generated for pilgrimage (Like Amarnathji yatra, Kumbh Mela, Kedarnath Jee yatra, etc.)
- The accumulated snow-bound area images during winter time are generated for specially monitoring the fresh and old snow and its coverage.
- Agriculture sector services. Satellite provides better guidance for agro meteorology with the help of many satellite-derived products (like Insolation, Land Surface Temperature, Evapotranspiration, etc.).
- Renewable energy sector: Satellite-based Winds, clouds, Outgoing longwave radiation, etc., provide an important input to this sector for managing the resources efficiently.
- Research and development activities. New algorithms and approaches (like AI/ML, deep learning, etc.) are also under development to further streamline the process.
- Therefore, with the support of INSAT-3DS (which provides advanced imaging and sounding capabilities), weather monitoring service capabilities are enhanced. It offered detailed observations of land and ocean surfaces, real-time data on cloud cover, moisture content, temperature profiles, and other atmospheric parameter which are crucial for weather monitoring.

The INSAT-3D has reached its end of life and has been replaced by the INSAT-3DS, whereas INSAT-3DR is operational in sensing and transmitting meteorological data.

This information was given by Dr. Jitendra Singh, Union Minister of State (Independent Charge) for Science and Technology, Earth Sciences, MoS PMO, Department of Personnel, Public Grievances and Pensions, Department of Space and Department of Atomic Energy, in a written reply in the Rajya Sabha today.

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**NKR/PSM**

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