

Cartosat 3

December 6, 2019

Source: *The Hindu*

Manifest pedagogy: As per the trend of UPSC prelims question on Science and Technology, studying the satellites launched by ISRO, their specifications and applications is helpful. The previous year examples are: IRNSS features in CSP-2018 and applications of Remote sensing satellites in CSP-2019.

In news: ISRO recently launched advanced earth imaging and mapping satellite CARTOSAT-3.

Placing it in syllabus: Achievements of India in Space technology

Static dimensions:

- What are cartosat satellites?
- History of cartosat series

Current dimensions:

- Specifications of cartosat 3
- Applications of cartosat

Content:

What are cartosat satellites?

- The Cartosat satellites are a **series of Indian optical earth observation satellites.**
- They are built and operated by ISRO.
- The series is a **part of the Indian Remote Sensing Program.**
- They are used for **Earth's resource management, defence services and monitoring.**
- The **Department of Space (DoS)** had launched and managed the **IRS series of remote sensing satellites.**

- Considering **increased demand for large scale and topographic mapping data**, the DoS launched the expanded Cartosat series.

History of Cartosat series:

CARTOSAT-1:

- It is the first Indian Remote Sensing Satellite **capable of providing in-orbit stereo images**.
- **It was launched in May 2005 by PSLV- C6.**
- The images were **used for Cartographic applications** meeting the global requirements.
- **Cameras** of this satellite had a **resolution of 2.5m**.
- It provided stereo pairs required for generating Digital Elevation Models, Ortho Image products and **value added products for various applications of Geographical Information System (GIS)**.

CARTOSAT-2:

- It is an advanced remote sensing satellite with a **single panchromatic camera (PAN)** capable of **providing scene-specific spot imageries** for cartographic applications.
- The camera is designed to provide **imagery with better than one meter spatial resolution**.
- **New technologies** like two mirror on axis single camera, Carbon Fabric Reinforced Plastic based electro optic structure, JPEG like data compression, advanced solid state recorder and high performance star sensors are being employed in Cartosat-2.
- Cartosat-2 suffered from some problems after launch.
- **An improved Cartosat 2A was launched in 2008.**
- **Cartosat 2B** was launched in 2010.
- **Cartosat 2C** was launched in June 2016.
- **Cartosat 2D and Cartosat 2E** followed in 2017 and **Cartosat 2F was launched in January 2018.**

Specifications of Cartosat 3:

- ISRO launched advanced earth imaging and mapping satellite **CARTOSAT-3 along with 13 other commercial nano-satellites for the US** using **PSLV-C47** on November 27, 2019.
- It is the **most advanced earth observation satellite built by ISRO.**



- CARTOSAT-3 is the ninth in the series, which is a **third-generation agile satellite with high-resolution imaging capabilities.**
- **It has an overall mass of over 1,600 kilograms with mission life of about five years.**
- 13 Commercial Nanosatellites from USA were launched under commercial arrangements with **New Space India Limited (NSIL), the commercial arm of ISRO.**
- **According to ISRO, the satellite will replace the IRS series.**

Features:

- It has an **imaging payload with a ground resolution of**
 - 0.25 m with 16 km swath in the panchromatic mode,
 - 1.13 m with 16 km swath in 4 band multispectral mode,
 - 12 m with 5 km in hyperspectral mode.
- It features a **MWIR Camera with 5.7 m resolution.**
- **New elements** have been developed like highly agile structural platform, payload platform, higher rate data handling and transmission systems, advanced onboard computer and new power electronics, dual gimbal antenna etc...

Applications of Cartosat:

Cartosat-3 will address the increased user's demands for:

- large scale urban planning,

- rural resource and infrastructure development,
- coastal land use and land cover,
- cartography (map-making applications),
- road-network monitoring,
- changing detection in bringing out geographical and man-made features.