

NISAR (NASA-ISRO Synthetic Aperture Radar) Mission

Prelims - Current events of national and international importance.

Mains (GS III) - Science and Technology- developments and their applications and effects in everyday life.

Why in news?

ISRO Chairman V Narayanan has recently confirmed that the satellite is scheduled for launch in June 2025 from Srihari Kota.

- NISAR NISAR is the 1st collaboration between NASA and ISRO for a **joint Earth observation satellite mission**.
- **Aim** To deliver exceptionally precise, <u>high-resolution image of Earth's dynamic surface</u> to observe and understand natural processes (solid Earth, ice masses, and ecosystems).
- Launch vehicle GSLV-F16 rocket.
- Key specification
 - Dual-band radar NISAR uses dual-band radar frequencies (L-band and S-band) to map the Earth's surface.

L-band (25-centimeter wavelength) detects larger features like tree trunks and penetrates vegetation, while S-band (10-centimeter wavelength) detects smaller features like leaves and rough surfaces.

- Together, they provide comprehensive Earth observations by capturing different aspects of surface features.
- o Orbit- Sun-synchronous, low Earth orbit (LEO) at an Altitude of 747 km.
- **Repeat cycle** It will scan nearly the entire *globe every 12 days*.
- Mission life 3 years.
- **Contributions NASA** It provides the *L-band radar*, reflector antenna, deployable boom, communication subsystem, GPS receivers, recorder, and data subsystem.
- ullet ISRO It provides the ${\it S-band\ radar}$ and handles calibration and data processing.
- \bullet ISRO is also $\underline{\textit{providing launching service}}$ with its GSLV Rocket.
- **Significance** Measuring *land deformation* from earthquakes, landslides, and volcanic activity.
- It will monitor,
 - The movement of glaciers and ice sheets
 - Forest and wetland changes
 - Soil moisture and water resources

- <u>Detecting surface changes</u> with centimeter-level precision through dense clouds and vegetation.
- It provides critical data for both scientific research and *disaster management*.
- The mission will help us to understand the *global carbon cycle*.

References

- 1. Business Today | Launch of NISAR Satellite
- 2. Business Today| NISAR Mission

