



# IRNSS-NaVIC: ISRO

## Why in News

Recently, the Vice President has suggested [ISRO \(Indian Space Research Organization\)](#) make **Indian regional navigation satellite system-Navigation in Indian Constellation (NaVIC)** for global use.

## Key Points

### ▪ Background:

- In 2006, the project was approved by the Government of India and was expected to be completed and implemented by 2015-16.
- The constellations' first satellite (IRNSS-1A) was launched on 1<sup>st</sup> July 2013 and the seventh and final satellite (IRNSS-1G) was launched on 28<sup>th</sup> April 2016.
  - With the last launch of the constellation's satellite (IRNSS-1G), **IRNSS was renamed Navigation Indian Constellation (NaVIC)** by India's Prime Minister.

### ▪ About:

- Presently, IRNSS **consists of eight satellites**, three satellites in geostationary orbit and five satellites in [geosynchronous orbit](#).
  - IRNSS-1I is **expected to replace IRNSS-1A**, which was rendered ineffective after its three rubidium atomic clocks failed.
- The main objective is **to provide reliable position, navigation and timing services** over India and its neighbourhood.
  - It works just like the established and popular US Global Positioning System (GPS) but **within a 1,500-km radius over the sub-continent**.
  - Technically satellite systems with more satellites provide more accurate positioning information.
    - However, compared to GPS (24 satellites) which has a position accuracy of 20-30 metres, the NavIC is able to pinpoint location to an estimated accuracy of under 20 metres.
- It has been **certified by the 3<sup>rd</sup> Generation Partnership Project (3GPP)**, a global body for coordinating mobile telephony standards.
- It was **recognised by the [International Maritime Organization \(IMO\)](#)** as a part of the World Wide Radio Navigation System (WWRNS) for operation in the Indian Ocean Region in 2020.
- ISRO is working to build the next generation of IRNSS satellites with indigenous atomic clocks and enhancements to navigation services.

### ▪ Potential Uses:

- Terrestrial, aerial and marine navigation;
- Disaster management;
- Vehicle tracking and fleet management (especially for mining and transportation sector);

- Integration with mobile phones;
- Precise timing (as for ATMs and power grids);
- Mapping and geodetic data capture.

▪ **Significance:**

- It gives real time information for 2 services i.e **standard positioning service open for civilian use** and **Restricted service which may be encrypted for authorised users** like for military.
- India became **one of the 5 countries having their own navigation system** like GPS of USA, GLONASS of Russia, Galileo of Europe and BeiDou of China. So India's dependence on other countries for navigation purposes reduces.
- It will **help scientific & technological** advancement in India. It is important for the **country's sovereignty** and strategic requirements.
- In April 2019, the **government made NavIC-based vehicle trackers mandatory** for all commercial vehicles in the country in accordance with the Nirbhaya case verdict.
- Also, Qualcomm Technologies has **unveiled mobile chipsets** supporting NavIC
- Further with extensive coverage, one of the stated future uses of the project includes **sharing of the project with the SAARC nations**. This will help in integrating the regional navigation system further and a diplomatic goodwill gesture from India towards countries of the region.

### GPS Aided Geo Augmented Navigation (GAGAN)

- This is a **Satellite Based Augmentation System (SBAS)** implemented jointly with Airport Authority of India (AAI).
- The system will be **interoperable with other international SBAS systems and provide seamless navigation across regional boundaries**.
  - The GAGAN Signal-In-Space (SIS) is available **through GSAT-8 and GSAT-10**.
- **Objectives:**
  - To provide Satellite-based Navigation services with accuracy and integrity required for civil aviation applications.
  - To provide better Air Traffic Management over Indian Airspace.

**Source: PIB**

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