

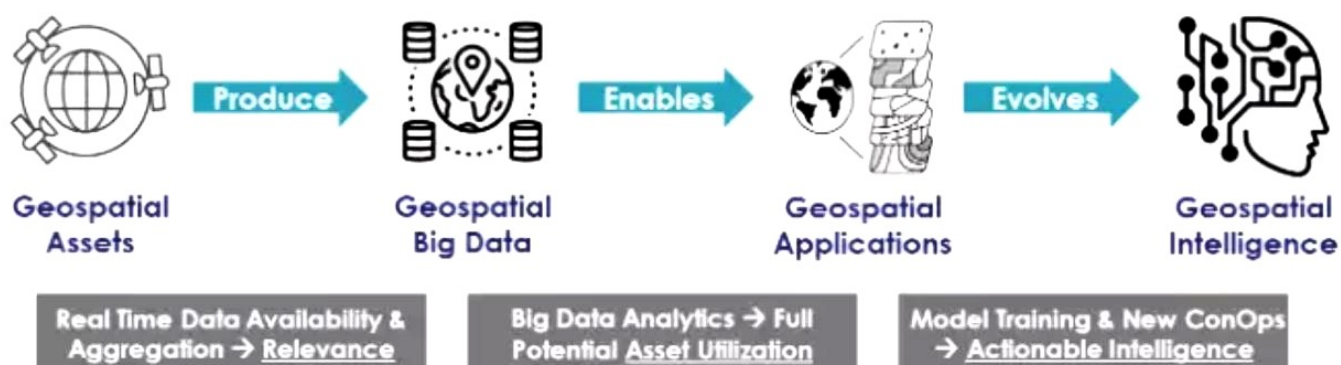
## Geospatial Intelligence

### Why in news?

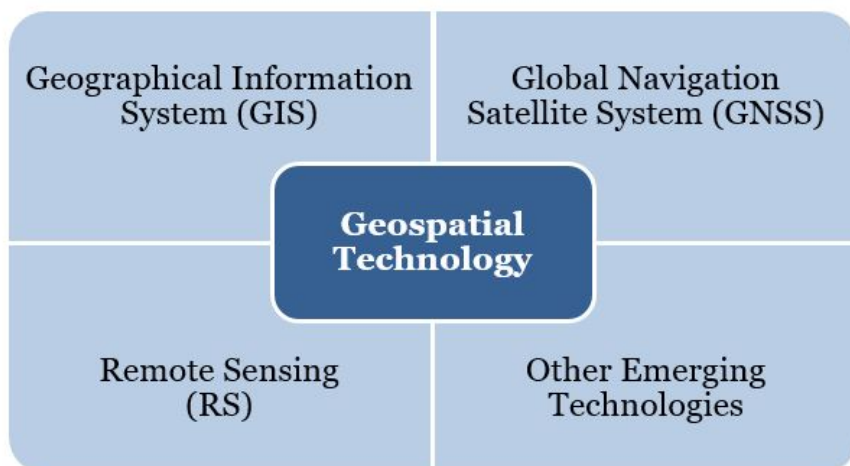
In recent times, geospatial intelligence has shown enormous potential from disaster management and environmental monitoring to military applications.

### What is GEOINT?

- **Geospatial intelligence** -It is the *collection and integration of data* from a network of technologies, including satellites, mobile sensors, ground-control stations and aerial images.
- The data is used to *produce real-time maps and simulations* to help identify when, where and to what extent a threat is likely to emerge.



- **Geospatial technology** - It is a term used to describe the range of modern tools contributing to the geographic mapping and analysis of the Earth and human societies.
- It can be used to create intelligent maps and models which help to collect geographically referenced data.



## Status of Geospatial Technology in India

- India's geospatial economy is expected to cross Rs 63,000 crore by 2025 at a growth rate of 12.8%.
- There are around 250 Geospatial Start-ups in India.
- Ministry of Science and Technology have launched [National Geospatial Policy, 2022](#), a citizen-centric policy that seeks to strengthen the Geospatial sector to support national development, economic prosperity and a thriving information economy.
- India have also unveiled a Geospatial Incubator.
- Second United Nations World Geospatial Information Congress ([UN-WGIC](#)) 2022 was organised in Hyderabad.
- A new geospatial data guideline was released in 2021.
- National organizations implementing GIS based projects are Survey of India, Geological Survey of India, National Atlas and Thematic Mapping Organization (NATMO), Indian Space Research Organisation (ISRO) and National Informatics Centre.

## Why Geospatial technology is important for India?

- **Employment** - It is expected to provide employment to more than 10 lakh people mainly through Geospatial Start-ups.
- **Promote innovation** - Democratization of Indian geospatial ecosystem will spur domestic innovation.
- **Global competition** - It will enable Indian companies to compete in the global mapping ecosystem by leveraging modern geospatial technologies.
- **Self-reliance** - It helps in realising the dream of Atmanirbhar Bharat.
- **Backup Indian land reforms** - Rural Development Ministry has mapped over 45 lakh km of rural roads and have digitised water bodies, green areas, plots, and other structures essential for administrative purposes.

[SVAMITVA](#) (*Survey of Villages and Mapping with Improvised Technology in Village Areas*) is piloted by the Ministry of Panchayati Raj in 2020 to digitise land records.

## What are the applications of Geospatial Intelligence?

- **Military applications** - Aids from regular surveillance to long-term situational awareness.
- Creates 3D models for all combat systems & operations and provide in-depth understanding positions of troops and equipment.
- Helps in maintaining decision superiority and sovereignty by analysing enemy vulnerability.
- Helps to plan future targeting action to minimise civilian damages.
  - *In Russian-Ukraine war*, a commercial satellite imagery company, was the 1<sup>st</sup> to

report the 40-mile-long convoy of Russian ground forces heading toward Kyiv in 2022.

- **Disaster Management** - GEOINT contributes to emergency preparedness and response thus helping officials to distribute resources and personnel, as well as issue storm warnings and evacuation orders.
  - The *National Hurricane Centre* actively monitors the location, formation and trajectory of tropical cyclones.
- It provides valuable guidance for search-and-rescue and recovery efforts following a disaster.
  - During the *2023 earthquake in Turkey and Syria*, maps and aerial images quickly identified the extent of damage and helped first responders locate access points.
- **Environmental Monitoring** - It monitors temperature, precipitation, snowpack and polar ice thus helping to anticipate and prepare for potential disturbances.
  - For instance, understanding temperature profiles across time provides information on when, where and to what extent is the threat.
- **Logistics and global supply chains** - The global economy runs on GPS, which provides detailed information on the time, location and destination of ships and cargo which leads to more consistent and reliable operations.

*The Global Positioning System (GPS) is a space-based radio-navigation system consisting of a constellation of satellites (currently 31) broadcasting navigation signals and a network of ground stations and satellite control stations used for monitoring and control.*

- **Transportation** - It helps in the rollout of autonomous vehicles.
- Using high-resolution imagery, city planners and engineers are able to detect markings and features on the ground such as bicycle lanes and traffic direction.
- **Digital twins** - It is contributing to the development, implementation and evaluation of digital twins which replicate real systems in digital world in real-time.
- Digital twins have been highly effective in conflict settings by simulating weather and terrain to help militaries and peacekeepers develop and enact strategies.
- **Health Sector** - Geo-enabled technology can be used for establishing telemedicine facilities, analysing infrastructure availability, etc.
- During Covid-19 pandemic, *Arogya Setu app* helped in identifying containment zones, monitoring citizen movement, administering vaccines and ensuring social distancing.

## References

1. [The Hindu| Uses of Geospatial Intelligence](#)
2. [Times of India| Geospatial Intelligence Technology](#)
3. [PIB| Geospatial Economy of India](#)



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