GAGAN

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What is GAGAN?

- GAGAN is an **acronym for GPS Aided GEO Augmented Navigation**.
- It is a Space Based Augmentation System (SBAS) **jointly developed by ISRO and AAI** to provide the best possible navigational services over Indian FIR (Flight Information Region) with the capability of expanding to neighbouring FIRs.
- It will serve as a low cost substitute to GPS service **over India, Bay of Bengal, South-east Asia and Middle East along with expansion up to Africa.**
- GAGAN is a system of satellites and ground stations that provide GPS signal corrections, giving you better position accuracy.
- **GPS alone does not meet the ICAOs navigational requirements** for accuracy, integrity and availability. **GAGAN corrects for GPS signal error**s caused by Ionospheric disturbances, timing and satellite orbit errors and also it provides vital information regarding the health of each satellite.
- One essential component of the GAGAN project is the **study of the ionospheric behaviour over the Indian region.**

Services Offered by GAGAN:

- It is **primarily being used in the aviation sector** for precise position information Services.
- And **others services include Forest** management, Railways signalling, Scientific Research for Atmospheric Studies, Natural Resource and Land Management, Location based services, Mobile, Tourism.

How does it work?

- GAGAN consists of a set of ground reference stations positioned across various locations in India called Indian Reference Station (INRES), which gathers GPS satellite data.
- A master station, Indian Master Control Centre (INMCC) collects data from reference stations and creates GPS correction messages.
- The corrected differential messages are up linked via Indian Uplink Station (INLUS) and then broadcasted on a signal from three geostationary satellites (GSAT-8, GSAT-10 and GSAT-15).
- The information on this signal is compatible with basic GPS signal structure, which means any SBAS enabled GPS receiver can read this signal.