

## Commercialization in India's Space Sector

### Why in news?

In order to secure strategic autonomy in its access to outer space, it's high time for India to tap the potential of private players in space sector.

### What is commercialization of space sector in India?

- Commercialization in India's space sector refers to the increasing involvement of private companies in space activities.
- It is enabled by policy changes that allow them to develop and launch satellites, provide space-based services, and compete in the global market.
- **Antrix Corporation Limited (ACL)** - It was established in 1992 is a wholly owned Government of India Company under the administrative control of the **Department of Space**.
- It is the Marketing arm of ISRO *for promotion and commercial exploitation of space products*, technical consultancy services and transfer of technologies developed by ISRO.
- **NewSpace India Limited (NSIL)** - It is *established in 2019* as a public sector undertaking of the Government of India.
- To spearhead *commercialization of space products including production of launch vehicles, transfer to technologies and marketing* of space products.
- **In-space** - It was *established in 2020* and functions as an *autonomous agency* in Department of Space (DOS).
- It acts as a **single window agency** for all space sector activities of private entities.
- **Emerging space startups** - Several private space companies have emerged in India, including Skyroot Aerospace, Agnikul Cosmos, Pixxel and Bellatrix Aerospace.

### Evolution of the Indian Space Program

- The journey of India's space program began in the 1960s with the formation of the ***Indian National Committee for Space Research (INCOSPAR)*** under the guidance of Dr. Vikram Sarabhai.
- The launch of ***Aryabhata in 1975*** marked India's first satellite.
- **Development of launch vehicle (1980's)** - The SLV-3 successfully launched the ***Rohini satellite***, making India a space-faring nation.
- **1990's** - Development of the PSLV (Polar Satellite Launch Vehicle) and GSLV (Geosynchronous Satellite Launch Vehicle) paved the way for reliable satellite launches.
- **Chandrayaan-1 (2008)** - India's ***first lunar mission***, confirmed the presence of water molecules on the Moon.
- **Mangalyaan (2014)** - The Mars Orbiter Mission, made India the first country to reach Mars orbit on its maiden attempt.
- **Chandrayaan-3 (2023)** - ***Successful soft landing*** on the Moon's South Pole cemented India's status as a global space power.
- India is preparing for the Gaganyaan mission, first human spaceflight.
- Development of ***reusable and heavy-lift rockets*** like the Next Generation Launch Vehicle (NGLV).

### **What is the importance of commercialization of the space sector?**

- **Developing reusable & heavy lift capability rockets** - As India is still depend on foreign nation in launching heavy satellites, there is a need for indigenous reusable and heavy lift capability rockets.
- For instance, GSAT-N2 is a communication satellite built by ISRO was launched on SpaceX's Falcon 9 rocket.
- **Economic growth** - India's space industry, valued at approximately ***7 billion USD***, has the potential to grow exponentially through increased private sector participation.
- **Global competitiveness** - India's cost-effective launch capabilities, demonstrated by missions like Chandrayaan-3 and Mangalyaan, make it an ***attractive destination for international satellite launches***.
- Expanding these services commercially ***can enhance India's share in the 440 billion USD in global space economy***.
- **Job Creation and Skill Development** - The growth of private space firms will ***create jobs*** in aerospace engineering, satellite design, and data analytics.
- **Strategic independence** - Commercialization reduces reliance on foreign providers for satellite services and technologies, ***strengthening India's autonomy in critical areas such as communication, navigation, and defense***.
- **Increased innovation** - Partnerships between ISRO and private firms can ***expedite the development of advanced technologies*** like reusable rockets and small satellite launchers.
- **Infrastructure development through PPP**- Commercialization encourages the development of state-of-the-art facilities, such as satellite assembly units and launch pads, through public-private partnerships (PPP).
- **Increased FDI inflows** - Commercialization will increase foreign direct investment (FDI) inflows in the space sector.
- India now permits ***up to 100% FDI in space sectors*** like satellite manufacturing and operation, satellite data products, and ground segment and user segment.

## What are the measures needed?

- **Strengthen policy framework** - The government must implement further supportive policies to encourage private sector involvement.
- **Providing milestone-based funding mechanisms** - It can reduce risks on private players as funding will be provided only after they meet certain objectives at every stage.
- It will *ensure accountability and reduce cost overruns*.
- **Leveraging the private industrial base** - In parallel to developing the NGLV, the Department of Space can give out contracts for reusable, heavy-lift rockets to capable private players to foster competition and capacity-building.
- **Promote global collaboration** - Indian companies should be encouraged to explore partnerships with global firms for technology transfer and co-development of advanced systems.
- This can accelerate the development of indigenous capabilities.
- **Develop infrastructure** - Investment in testing facilities, launch pads, and research centers is crucial.
- Shared infrastructure can reduce entry barriers for startups and smaller firms.
- **Focus on education and training** - Building a skilled workforce is essential.
- Universities and research institutions must align their curricula with the needs of the space industry to ensure a steady pipeline of talent.
- **Public-private partnerships** - ISRO's expertise can complement the agility and innovation of private firms through well-structured collaborations.
- Joint ventures can address complex challenges and accelerate project timelines.

### Quick facts

- **Next Generation Launch Vehicle (NGLV)** - It is designed to have a maximum payload capability of 30 tonnes to Low Earth Orbit.
- **Project duration** - It is targeted to complete the development phase in 8 years from 2024.
- **Significance** - NGLV will have 3 times the present payload capability compared to LVM3.
- It will also have reusability resulting in low-cost access to space and modular green propulsion systems.
- The development of NGLV will enable the launch of human spaceflight missions to Bharatiya Antariksh Station, Lunar/inter-planetary exploration missions and communication & earth observation satellite constellations to Low Earth Orbit.

## Reference

[The Hindu | Deepening India's Steps as a Key Space-Faring Nation](#)