



## The New Space Age

This editorial is based on [“Space for start-ups”](#) which was published in Business Standard on 21/11/2022. It talks about India's Space Sector and successful launch of Vikram-S, India's first privately built rocket.

**For Prelims:** India's Space Economy, Vikram-S, Vikram Sarabhai, Satellite communication, BeiDou, Climate change, Space Debris, Ozone Depletion, Commercialization of outer space, Economic Survey 2020-2021, Project NETRA, Gaganyaan Mission.

**For Mains:** Importance of Space Sector, Challenges Related to Outer Space, Enhancing Space Self-Defense Capacities, Space 4Women in India.

The [Space domain](#) is expanding as never before, with **rapidly increasing investment from both the public and private sectors** and an accelerated pace of technological innovation, pioneering **The New Space Age**.

[India's Space Economy](#) is likely to be worth nearly **USD 13 billion by 2025**, with the **satellite launch services** segment set to witness the fastest growth due to increasing private participation.

The successful launch of [Vikram-S](#), **India's first privately built rocket from start-up Skyroot**, has focused welcome attention on the **opening up of space to private enterprise**.

While it **affords many opportunities**, it **also poses distinct challenges** that need to be examined to develop holistic perspectives of New Space and move towards peaceful and Sustainable Development in the Space sector.

### What is Vikram S?

- **Vikram S is a rocket** developed by **Indian Space Technology** startup **Skyroot Aerospace**. It is named after [Vikram Sarabhai](#), the founder of India's space programme.
- It is a single-stage **sub-orbital launch vehicle** that would carry three customer payloads.
  - It has been **built using advanced technologies including carbon composite structures and [3D-printed](#) components**.

### Why is Development in the Space Sector Important?

- **Positive Carryover to Other Sectors:** Space avenue is an **integration of the aerospace, IT**

hardware and [telecom sectors](#). It is thus argued that investment in this arena would foster **positive carryover effects to other sectors as well.**

- **Connect the Unconnected:** As for connectivity, [satellite communication](#) can reach more remote areas where conventional networks would require a heavy complimenting infrastructure.
  - The [World Economic Forum](#) had stated (in September 2020) that **satellite communication can help connect 49% of the world's unconnected population.**
- **Tackling Climate Change:** Satellites provide **more accurate information on [weather forecasts](#) and assess (and record) long-term trends in the climate** and habitability of a region.
  - For example, by **monitoring the long-term impact of [climate change](#)** at regional, territorial, and national scales, **governments would be able to devise more pragmatic and combative plans of action** for farmers and dependent industries.
  - Additionally, they can also serve as **real-time monitoring and early-warning solutions against natural disasters** such as **earthquakes, tsunamis, floods, wildfires, mining etc.**
    - Real-time tracking can also serve **multiple purposes in defense.**

## What are the Challenges Related to Outer Space?

- **Small Window for Private Entry:** Approximately **Rs. 15,000 crore is earmarked for ISRO's annual budget, most of which is spent on building rockets and satellites.** Also, **the private sector has a relatively small window of opportunity.**
  - Due to this, India's space economy is small, and its potential has not been fully realized.
- **Influence of China in Space:** Due to the successful launch of its own navigation system, [BeiDou](#), China has established a **strong presence in space.**
  - A strong position for China will be solidified if [Belt Road Initiative \(BRI\) members contribute to or join China's space sector.](#) Emerging space powers like India face a serious challenge in this regard.
- **Rise of Space Debris:** Increasing space exploration is **causing more [space debris](#) to accumulate in the outer solar system,** which can damage ongoing and future space missions due to high orbital speeds.
  - Space Debris can also **lead to [ozone depletion.](#)**
- **Increasing Global Trust Deficit:** An arms race for weaponization of outer space is creating an **environment of suspicion, competition, and aggressiveness** across the globe, **potentially leading to conflict.**
  - It would also put at risk the **entire range of satellites as well as those involved in scientific explorations and communication services.**
- **Unregulated Commercialisation:** [Commercialization of outer space](#) is accelerating due to **the development of satellite expeditions** to provide Internet services (**Starlink-SpaceX**) and for space tourism (**Jeff Bezos**).
  - If no regulatory framework is in place, rising commercialisation could lead to **monopolization of space.**

## What Should be the Way Forward?

- **Legislative Backing to Private Entities:** As per the [Economic Survey 2020-2021](#), over 40 funded start-ups are working in India in the space segment and the number is likely to increase in the coming years.
  - The current and emerging scenario justifies the need for **casting the rights and obligations of private entities in legal certainty** through a **National Legislation on private space activities in India.**
  - It would also support India to effectively discharge its obligations under **UN Treaties on Outer Space activities.**
- **Enhancing Space Self-Defense Capacities:** As space becomes a fourth battlefield, India needs to enhance its space capabilities. The **Kilo Ampere Linear Injector (KALI)** is being **developed as a possible response to incoming missiles** intended to disrupt the country's peace is a good step in this direction.
- **Defending India's Space Assets:** In order to effectively defend its space assets, including debris and spacecraft, India needs reliable and accurate tracking capabilities.

- **Project NETRA**, an early warning system in space to detect debris and other hazards to Indian satellites is a good step in this direction.
- **Space 4Women in India:** India can replicate The **United Nations Office for Outer Space Affairs (UNOOSA)**' **Space 4Women project** to promote **gender equality and women's empowerment in space.**
  - **Space awareness programmes should be established in rural areas in India, and college-ISRO internships can be developed specially for female students** to introduce them to the possibility of extending their wagons beyond our planet.
- **Permanent Seat in Space:** India should take the initiative to cooperate with international bodies and plan for a **planetary defense program** and **joint space missions** in the long term.
  - Also, with the **Gaganyaan mission**, **ISRO has begun to focus on manned space flight as part of its rethinking of India's space presence.**

### ***Drishti Mains Question***

Emerging Space has multiplied India's capacities, but also added to its vulnerabilities. Comment.

## **UPSC Civil Services Examination, Previous Year Question (PYQ)**

### **Prelims**

**Q.1 In the context of space technology, what is “Bhuvan”, recently in the news? (2010)**

- (a) A mini satellite launched by ISRO for promoting the distance education in India
- (b) The name given to the next Moon Impact Probe, for Chandrayaan-II
- (c) A geoportal of ISRO with 3D imaging capabilities of India
- (d) A space telescope developed by India

**Ans: (c)**

### **Mains**

**Q.1** What is India's plan to have its own space station and how will it benefit our space programme? **(2019)**

**Q.2** Discuss India's achievements in the field of Space Science and Technology. How the application of this technology helped India in its socio-economic development? **(2016)**