



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)**