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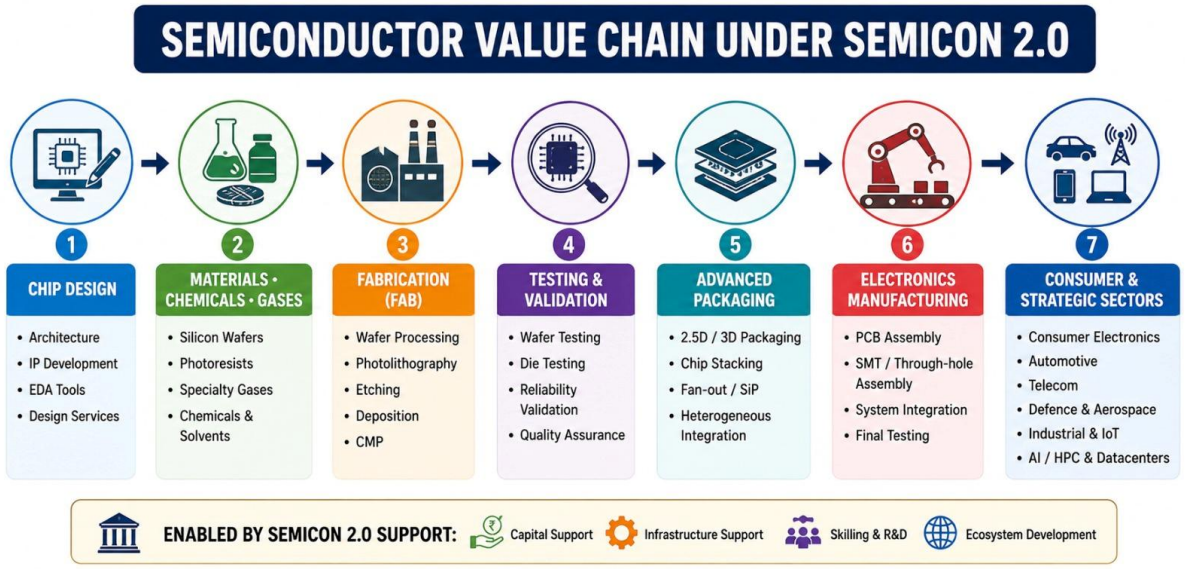
DAILY CURRENT AFFAIRS DATED 19.07.2026

GS Paper II: Current Affairs

1. Semicon 2.0: Building a Comprehensive Semiconductor Ecosystem

a. Introduction

The Union Cabinet has approved Semicon 2.0, the second phase of the India Semiconductor Mission (ISM), with an outlay of ₹1.27 lakh crore. The initiative seeks to expand India's semiconductor strategy beyond fabrication by strengthening chip design, research and development, materials, equipment, skills and resilient domestic supply chains.



b. Background Context

Semiconductors form the foundation of the modern digital economy. They are essential for smartphones, computers, automobiles, telecommunications equipment, medical devices, defence platforms and emerging technologies such as artificial intelligence, quantum computing and the Internet of Things.

The COVID-19 pandemic, geopolitical tensions and technology-related export controls exposed the vulnerability of globally concentrated semiconductor supply chains. Consequently, major economies have begun investing in secure and diversified domestic capabilities.

India launched the India Semiconductor Mission in 2021 to establish an initial manufacturing base. Semicon 2.0 builds upon this foundation by shifting from support for individual projects towards the creation of an integrated and globally competitive semiconductor ecosystem.

c. Key Features of Semicon 2.0

Support for the Entire Value Chain

The programme extends support beyond semiconductor fabrication to include:

- Chip design and indigenous intellectual property creation.
- Semiconductor-grade chemicals, gases and specialised materials.
- Capital equipment required for chip manufacturing.
- Research and development in advanced technologies.
- Talent development and specialised workforce creation.

Differentiated Capital Support

Segment	Government Support
Silicon fabrication plants	40% capital subsidy
Supply-chain units and advanced packaging	35% capital subsidy
Conventional semiconductor packaging	25% capital subsidy

The rationalised subsidy structure seeks to distribute public support across a wider range of ecosystem participants rather than concentrating it primarily on fabrication plants.

Strengthening the Semiconductor Laboratory, Mohali

The Semiconductor Laboratory, Mohali, is being developed as a national facility for chip design, prototyping and tape-out services.

Tape-out refers to the stage at which a completed chip design is converted into a form ready for fabrication. The facility will enable universities, research institutions and start-ups to transform their designs into manufacturable prototypes.

Industry–Academia Collaboration

The mission seeks to strengthen collaboration among industry, universities, research institutions and start-ups. This can help bridge the gap between laboratory research, commercial design and large-scale manufacturing.

Together, these measures indicate a transition from subsidy-led manufacturing towards ecosystem-based semiconductor development.

d. How Semicon 2.0 Differs from the First Phase

India Semiconductor Mission 1.0	Semicon 2.0
Primarily focused on fabrication and packaging	Covers the entire semiconductor value chain
Offered capital support of up to 50%	Provides targeted subsidies ranging from 25% to 40%
Limited focus on materials, equipment and research	Strong emphasis on design, R&D, equipment and supply chains
Sought to establish an initial manufacturing base	Seeks long-term self-reliance and global competitiveness
Relatively project-oriented approach	Integrated ecosystem-oriented approach

Thus, Semicon 2.0 represents an expansion in both the scope and strategic ambition of India's semiconductor policy.

e. Significance

- **Technological Self-Reliance:** Domestic semiconductor capabilities can reduce India's dependence on imported chips and strengthen autonomy in a strategically critical sector.
- **Supply-Chain Resilience:** A diversified domestic ecosystem can protect India against shortages arising from geopolitical conflicts, export controls, natural disasters and logistical disruptions.

- **Innovation and Intellectual Property:** The emphasis on chip design, research and indigenous intellectual property can help India move beyond assembly-based manufacturing towards innovation-driven growth.
- **High-Value Employment:** Semiconductor design, fabrication, packaging and equipment manufacturing can generate high-skilled employment for engineers, researchers and technicians.
- **Support for Strategic Sectors:** Reliable access to semiconductors is essential for defence, telecommunications, artificial intelligence, automobiles, renewable energy, healthcare and digital infrastructure.
- **Global Value-Chain Integration:** A complete domestic ecosystem can enable Indian firms to participate in higher-value segments of the global electronics and semiconductor supply chains.

However, realising these benefits will require India to overcome significant technological, financial and institutional constraints.

f. Challenges

- **Limited Research Capacity:** India's semiconductor research and process-development capabilities remain modest compared with established semiconductor economies.
- **Import Dependence:** The country continues to rely heavily on imported fabrication equipment, advanced technologies, specialised materials and manufacturing inputs.
- **Skill Shortages:** There is a shortage of engineers, researchers and technicians trained in chip design, fabrication, packaging and process engineering.
- **Intense Global Competition:** India faces competition from established semiconductor hubs such as Taiwan, South Korea, China, the United States and Japan, which possess mature ecosystems, technological advantages and economies of scale.
- **High Costs and Long Gestation:** Semiconductor projects require large investments, advanced infrastructure and long periods before commercial viability is achieved.
- **Infrastructure Requirements:** Fabrication plants require uninterrupted electricity, ultra-pure water, sophisticated logistics and highly reliable industrial infrastructure.

These constraints make sustained policy continuity and careful implementation essential.

g. Way Forward

- **Strengthen Research and Collaboration:** Universities, research institutions and industry should establish joint laboratories, research programmes and technology-transfer platforms.
- **Build a Skilled Workforce:** Specialised courses, industry-linked training and advanced research programmes should be expanded in semiconductor design, materials science and process engineering.
- **Promote Indigenous Intellectual Property:** Policy support should encourage domestic chip design, patent creation and commercialisation of research outcomes.
- **Ensure Timely Project Execution:** Approved fabrication, packaging and design facilities must be implemented on schedule to build investor confidence and generate ecosystem-wide demand.
- **Develop Supporting Industries:** India should promote domestic production of specialised chemicals, gases, substrates, equipment and electronic components to reduce import dependence across the value chain.
- **Maintain Policy Stability:** Long-term regulatory certainty, ease of doing business and sustained public investment will be essential to attract global and domestic investors.

Conclusion

Semicon 2.0 marks an important evolution in India's semiconductor strategy—from promoting isolated manufacturing facilities to building a comprehensive ecosystem encompassing design, research, manufacturing, packaging, skills and supply chains. Its success can strengthen India's

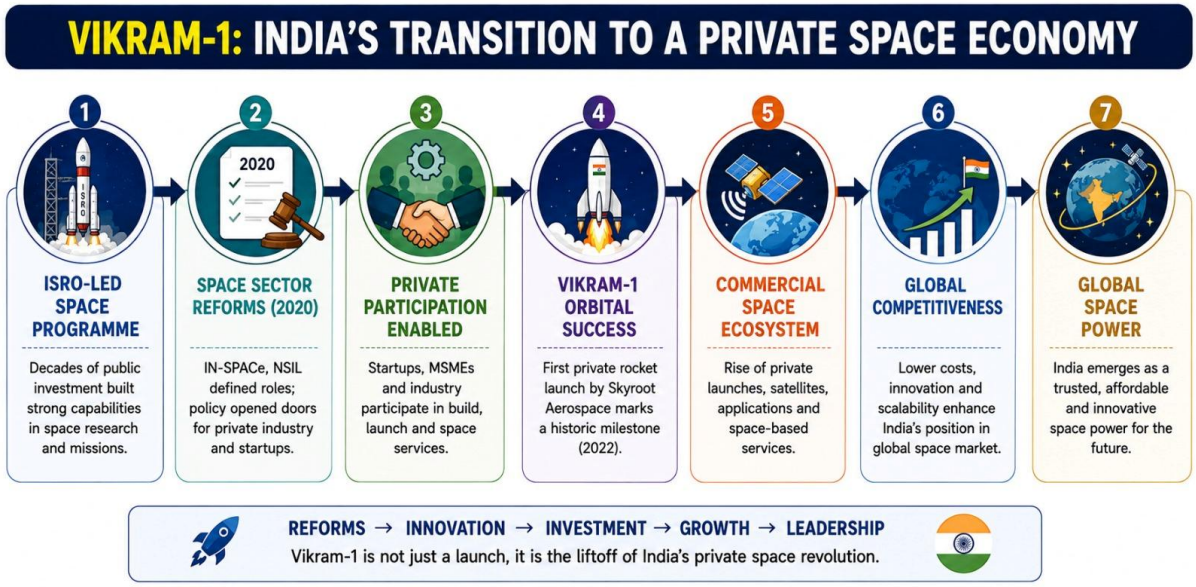
technological self-reliance, industrial competitiveness and strategic autonomy. However, achieving these objectives will depend upon sustained investment, timely execution, strong industry–academia collaboration and the development of globally competitive indigenous capabilities.

GS Paper III: Science and Technology

2. Vikram-1: India's First Private Orbital Rocket Mission

a. Introduction

On July 18, 2026, Skyroot Aerospace's Vikram-1 successfully placed two satellites—SCOPE and Grahaa—into Low Earth Orbit from the Satish Dhawan Space Centre, Sriharikota. It became the first privately developed Indian launch vehicle to successfully reach orbit, marking a historic milestone in India's space-sector reforms.



b. Background Context

For several decades, India's space programme was primarily led by ISRO, which developed launch vehicles, satellites and space-based applications, while private companies largely functioned as component suppliers.

Recognising the growing commercial potential of space activities, the Government introduced structural reforms in 2020 to permit non-governmental entities to undertake launch, satellite and downstream space operations.

Institutional Framework

- IN-SPACe was established as an autonomous agency to authorise, promote and facilitate private space activities.
- NSIL was entrusted with commercialising ISRO's technologies, products and services.
- ISRO began providing private entities with technical guidance and access to testing, manufacturing and launch facilities.

These reforms enabled Indian start-ups to move from supplying components to designing and operating complete space systems.

c. Key Features of the Vikram-1 Mission

Indigenous Private Launch Vehicle

Vikram-1 was developed by Skyroot Aerospace, a Hyderabad-based space start-up founded by former ISRO scientists.

It is a four-stage small-satellite launch vehicle comprising:

- Three solid-propellant stages.
- A liquid-propellant upper stage.
- Indigenous avionics, propulsion and carbon-composite structures.

Successful Orbital Deployment

- The maiden mission successfully deployed SCOPE and Grahaa satellites into Low Earth Orbit, while additional payloads remained attached to the upper stage for in-orbit experiments.

Institutional Support

- ISRO provided access to solid-motor casting, static-testing and liquid-engine testing facilities. It also supported vehicle integration, trajectory analysis and launch operations.
- IN-SPACe facilitated regulatory authorisation, technical reviews, access to ISRO infrastructure and mission-readiness assessment.

Continuity with Mission Prarambh

- Vikram-1 builds upon Vikram-S, India's first privately developed suborbital rocket, launched by Skyroot under Mission Prarambh in November 2022. The earlier mission validated technologies subsequently used in the Vikram family of orbital launch vehicles.

The successful orbital mission therefore represents the progression of India's private space industry from technology demonstration to operational launch capability.

d. Significance

- **Transformation of India's Space Programme:** The mission marks a shift from a predominantly government-led model to a collaborative ecosystem in which private enterprises complement ISRO's scientific and technological capabilities.
- **Growth of the Commercial Space Economy:** Vikram-1 establishes an indigenous private capability for launching small satellites, enabling Indian firms to compete in the expanding global market for dedicated and on-demand launch services.
- **Promotion of Deep-Technology Innovation:** The mission encourages start-ups to develop indigenous capabilities in propulsion, avionics, advanced materials, launch systems and satellite technologies.
- **Reduced Burden on ISRO:** Private companies can undertake routine commercial launches, allowing ISRO to concentrate more extensively on scientific exploration, advanced research and strategic missions.
- **Strategic Autonomy:** Indigenous private launch capabilities reduce dependence on foreign launch providers and enhance India's ability to deploy or replace satellites required for communications, navigation, surveillance and disaster management.
- **Responsive Space Capability:** Smaller private launch vehicles can potentially provide faster and more flexible access to orbit, which is increasingly important during emergencies or strategic contingencies.
- **Employment and Industrial Development:** The expansion of private space activities can generate high-skilled employment and stimulate growth in precision manufacturing, electronics, advanced materials and specialised engineering.

Vikram-1 thus represents not merely a successful launch but a broader structural transformation of India's space ecosystem.

e. Challenges

- **High Capital Requirements:** Developing and operating launch vehicles requires substantial investment, complex engineering and long development cycles, making commercial sustainability difficult for start-ups.
- **Limited Infrastructure:** India requires additional launch pads, testing facilities, manufacturing clusters and ground infrastructure to support a rapidly expanding private space sector.
- **Global Competition:** Indian companies must compete with established international launch providers possessing greater financial resources, operational experience and economies of scale.
- **Regulatory Predictability:** Efficient licensing, safety clearances, spectrum allocation, liability rules and insurance mechanisms are necessary to maintain investor confidence.
- **Access to Long-Term Finance:** Deep-technology space enterprises require patient capital, but specialised venture funding and long-term financing remain limited.
- **Space Sustainability:** An increase in private launches must be accompanied by measures for orbital-debris mitigation, space-traffic management and responsible use of outer space.

Addressing these constraints is essential for converting a technological milestone into a commercially sustainable ecosystem.

f. Way Forward

- **Strengthen IN-SPACe:** IN-SPACe should function as an efficient single-window institution for authorisation, infrastructure access and regulatory coordination.
- **Expand Public–Private Collaboration:** Collaboration should be strengthened across launch vehicles, satellite manufacturing, propulsion, ground stations and downstream space applications.
- **Improve Access to Finance:** Dedicated space funds, credit guarantees, venture capital and government-supported technology funds should be developed for space start-ups.
- **Develop Shared Infrastructure:** Private enterprises should receive transparent access to government testing and launch facilities while dedicated private infrastructure is gradually developed.
- **Ensure Regulatory Stability:** India should establish a predictable framework governing licensing, liability, insurance, intellectual property, data security and space sustainability.
- **Expand Global Partnerships:** Indian companies should be supported in accessing international customers, investments and technology partnerships to strengthen their global competitiveness.

Conclusion

The successful orbital launch of Vikram-1 marks a defining moment in the evolution of India's space programme. It demonstrates that the reforms initiated in 2020 have enabled private enterprises to progress from component manufacturing to complete orbital missions. By combining ISRO's institutional strengths with private-sector innovation, India can emerge as a competitive hub for affordable, reliable and responsive space services. Sustained progress, however, will require regulatory certainty, patient capital, expanded infrastructure and close public–private collaboration.

Reader's Note — About This Current Affairs Compilation

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While every effort has been made to balance depth with brevity, please keep the following in mind:

1. Orientation & Purpose

This compilation is curated primarily from the UPSC Mains perspective — with emphasis on conceptual clarity, analytical depth, and interlinkages across GS papers.

However, the PrepAlpine team is simultaneously developing a dedicated Prelims-focused Current Affairs Series, designed for:

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- data recall
- Prelims-style MCQs
- objective pattern analysis

This Prelims Edition will be released separately as a standalone publication.

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The formatting combines:

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- lists
- tables
- visual cues

—all optimised for retention.

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