India’s Need for Space Security

Mains: *GSIII – Science & Technology*

Why in News?

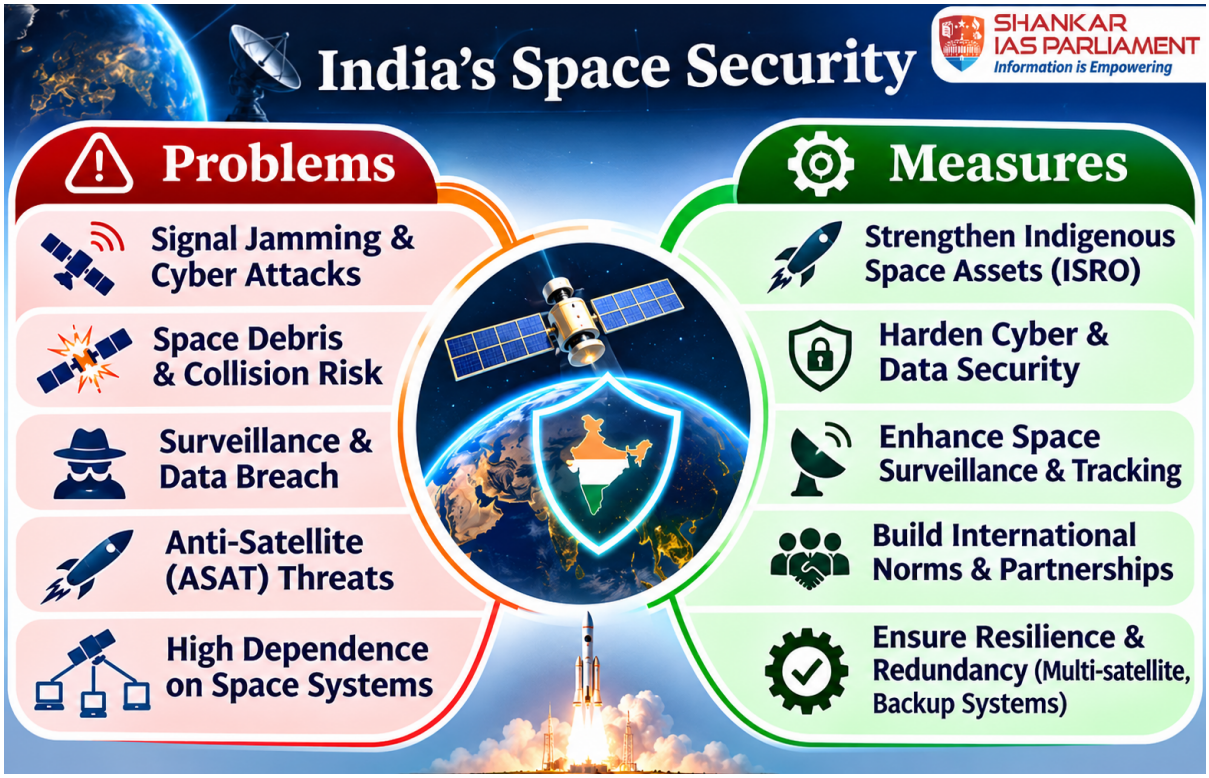
The recent trends of emerging space threats highlights the need for a comprehensive Indian Space Security Doctrine to address and protect India's growing dependence on space-based services.

What is the Growing Significance of Space Security?

- **Critical Infrastructure** – Satellites support communication, navigation, weather forecasting, logistics, banking and disaster management.
- **National Security** – Space assets provide armed forces with surveillance, positioning, timing, communication and situational awareness.
- **Strategic Autonomy** – Reliable space capabilities strengthen India's technological independence and national resilience.
- **Economic Dependence** – Increasing civilian and commercial use of satellite services makes space security essential for economic stability.

What is the Changing Threat Landscape in Space?

- **Jamming** – Interfering with satellite signals to disrupt communication and navigation.
- **Spoofing** – Transmitting false signals to mislead navigation and positioning systems.
- **Cyberattacks** – Targeting satellite networks, ground stations and supporting infrastructure.
- **Electronic Warfare** – Degrading satellite signals and reducing the reliability of space-enabled systems.
- **Attribution Challenges** – Identifying perpetrators becomes difficult when attacks originate through complex networks or involve multiple actors.



What are the Major Challenges for India's Space Security?

- **Lack of Clear Doctrine** – Absence of clearly defined thresholds for distinguishing accidental interference from deliberate attacks.
- **Attribution Difficulties** – Determining responsibility for temporary disruptions, cyber interference and signal manipulation.
- **Civil-Military Interdependence** – Disruption of commercial satellite services can affect both civilian infrastructure and military operations.
- **Escalation Risks** – Responding to uncertain or ambiguous threats may unintentionally escalate strategic tensions.
- **Infrastructure Vulnerability** – Dependence on interconnected satellite systems increases the possibility of cascading disruptions.

What is the Existing Policy Framework?

- **Indian Space Policy 2023** – Provides an overarching framework for India's space activities and participation of private entities.
- **Indian Space Situational Awareness Report (ISSAR-2025) –** Documents India's efforts in space situational awareness, collision avoidance and space-debris mitigation.
    - However, India needs to strengthen the integration of these frameworks with hostile disruption assessment, attribution and crisis-response mechanisms.

What the Way Forward?

- **Establish Clear Thresholds** – Define what constitutes an attack on space assets, including jamming, spoofing and cyber interference.
- **Strengthen Space-Domain Awareness** – Monitor activities around Indian space assets and identify suspicious behaviour and potential threats.
- **Build System Resilience** – Develop multiple systems, redundancy and alternative

capabilities to ensure continuity of essential services.

- **Improve Attribution Mechanisms** – Establish standards to identify perpetrators and assess the nature and severity of interference.
- **Ensure Rapid Recovery** – Develop reconstitution and restoration capabilities to recover essential space services after disruption.
- **Public-Private Coordination** – Strengthen cooperation among government agencies, armed forces, ISRO and commercial satellite operators.
- **Responsible Space Governance** – Promote peaceful utilisation of outer space while developing credible deterrence against hostile activities.

What lies ahead?

- India's objective should not be to transform outer space into another arena of conflict but to prevent disruptions in space from creating vulnerabilities on Earth.
- A comprehensive doctrine based on resilience, deterrence, attribution and recovery is essential to protect national security and preserve the peaceful use of outer space.

Reference

The Hindu| India needs a holistic doctrine on space security

SHANKAR IAS PARLIAMENT
Information is Empowering