International Journal for Multidisciplinary Research (IJFMR)
E-ISSN: 2582-2160 ● Website: www.ijfmr.com ● Email: editor@ijfmr.com

India's Quest for Space Sovereignty: Foreign Policy, Strategic Autonomy, and the Politics of Space Security

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Abstract:
This research paper explores India's growing role in outer space as part of its broader goals of achieving strategic autonomy and strengthening foreign policy. India's space program, which began with peaceful and developmental objectives, has expanded to include scientific innovation, space diplomacy, security, and commercial partnerships. The study examines how India's space activities are influenced by historical experiences, national ambitions, and changing global space dynamics.
Key areas discussed include India's regional competition, especially with China, its participation in space security through measures like the ASAT test, and the role of new space policies and private sector involvement. The paper also highlights India's engagement in international forums and partnerships with countries like the United States and France. Using political science theories and international relations perspectives, this research shows how India balances cooperation with self-reliance in its pursuit of space sovereignty.
The findings suggest that India's space strategy is carefully shaped to protect national interests while contributing to global norms and peaceful uses of outer space.

Keywords: India's Space Policy, Space Sovereignty, Strategic Autonomy, Foreign Policy, Space Security, Space Diplomacy, ISRO, Space Commercialization, Outer Space Governance

Introduction

Outer space has become a critical domain of technological advancement, strategic competition, and geopolitical negotiation (Johnson-Freese, 2007; Tannenwald, 2004). Although governed by the Outer Space Treaty of 1967, the international legal and political framework remains fragmented, challenged by militarization trends, commercial expansion, and power rivalries (Stroikos, 2022; Rajagopalan & Stroikos, 2024). Within this context, India's pursuit of space sovereignty reflects its broader foreign policy goals of strategic autonomy, scientific modernity, and international recognition.
Initially envisioned by Vikram Sarabhai and other scientific nationalists, India's space program emerged as a development-oriented initiative rooted in peaceful uses of outer space (Sarabhai, 1974; Kochhar, 2008). Indian Space Research Organisation (ISRO) became a symbol of post-colonial capacity-building aimed at agricultural, meteorological, and communication benefits for socio-economic development (Siddiqi, 2015; Reddy, 2008). This policy was aligned with India's non-aligned and autonomous global posture, projecting the state as a responsible spacefaring nation.

However, India's space trajectory evolved from purely civilian objectives to more diversified and strategic goals. The launches of Chandrayaan-1, Mangalyaan, and the upcoming Gaganyaan missions represent not only scientific milestones but also tools of national pride and diplomatic leverage (Aliberti, 2018; Bagla & Menon, 2014; Amos, 2014). Such initiatives enhance India's soft power and signal its capabilities in a competitive regional order, especially amid China's assertive space posture (Pant & Gopalaswamy, 2008; Mistry, 2001).

Simultaneously, India has entered the realm of space security. The successful anti-satellite (ASAT) test in 2019, creation of the Defence Space Agency, and Project NETRA highlight a more assertive posture in safeguarding space assets and deterring threats (Stroikos, 2023; Rajagopalan, 2011; Madhumathi, 2019). These steps indicate India's readiness to secure its sovereign interests in the increasingly contested domain of outer space.

India also engages in space diplomacy by balancing normative commitments with strategic partnerships. While actively participating in the UN Committee on the Peaceful Uses of Outer Space (UNCOPUOS) and supporting norms for space sustainability, India has collaborated with powers like the U.S., France, and members of the Quad to advance its scientific and strategic interests (Stroikos, 2024; Rajagopalan, 2021; Tellis, 2006). This reflects a dual-track foreign policy of normative participation and geopolitical hedging.

Finally, India's space policy is undergoing commercialization. The Indian Space Policy 2023, establishment of IN-SPACe and NSIL, and emergence of startups like Skyroot signify a paradigm shift in India's space governance, where public-private partnerships drive both innovation and strategic capability (Prasad & Rajagopalan, 2020; Ramesh, 2020).

This paper explores India's quest for space sovereignty through the lenses of strategic autonomy, norm entrepreneurship, and the international politics of technology. It argues that India is shaping a hybrid space order—balancing cooperation with capability, law with strategy, and ambition with responsibility—thereby constructing its identity as an emerging space power in the global order.

Literature Review

India's evolving space trajectory has increasingly garnered scholarly attention for its intersection of technological prowess, strategic autonomy, and international diplomacy. Scholars like Johnson-Freese (2007) and Sheehan (2007) underscore space as a strategic domain integral to state power projection, where technological advancements intersect with national security imperatives. This view is echoed by Stroikos (2022), who situates outer space within broader International Relations (IR) frameworks, highlighting how rising powers like India employ space policy to assert global status.

Historically, India's space program has been portrayed as a developmental tool rooted in peaceful uses, emphasizing societal benefits over militarization (Sarabhai, 1974; Kochhar, 2008). Scholars such as Reddy (2008) and Siddiqi (2015) frame this narrative within India's postcolonial identity and non-aligned policy, arguing that the Indian Space Research Organisation (ISRO) was a manifestation of techno-nationalism designed to promote sovereignty through indigenous capability-building.

However, the literature also captures a strategic shift. Mistry (2001) and Aliberti (2018) highlight how India's missions like Chandrayaan and Mangalyaan serve dual purposes: advancing scientific knowledge and enhancing soft power in a competitive geopolitical environment. Scholars such as Pant and Gopalaswamy (2008) and Tellis (2006) contend that India's growing missile and satellite capabilities signal a calibrated approach to deterrence and defense, especially amid China's assertive space strategy.

Stroikos (2023) and Rajagopalan (2011) analyze India's anti-satellite (ASAT) test in 2019 as a strategic milestone, underscoring New Delhi's intent to project power while navigating the legal ambiguities of space militarization. Complementary to this, Rajagopalan and Stroikos (2024) explore India's normative positioning, noting its simultaneous advocacy for peaceful use of space and readiness for space security preparedness through institutions like the Defence Space Agency.

India's space diplomacy has also received academic attention. Authors like Stroikos (2024), Mohan and Chan (2018), and Rajagopalan (2021) highlight how India leverages multilateral platforms (e.g., UNCOPUOS) and bilateral partnerships (with the U.S., France, and the Quad) to shape global space governance norms while aligning with its strategic interests. Similarly, Tellis (2006) and Rajagopalan (2021) examine the role of strategic partnerships in fostering interoperability and mutual trust in a multipolar space environment.

On the economic front, scholars such as Prasad and Rajagopalan (2020), Ramesh (2020), and Murthi (2020) detail the liberalization of India's space sector through reforms like IN-SPACe and NSIL. These efforts, including collaborations with private startups like Skyroot, represent a paradigm shift towards space commercialization, innovation, and public-private synergy. This commercial turn is not merely economic but also strategic, enabling dual-use technologies with civilian and defense potential (Bagla & Menon, 2014; Rajagopalan, 2019).

India's approach to space governance thus reflects a hybrid framework—balancing normative leadership with strategic pragmatism. As Stroikos (2020) and Tannenwald (2004) argue, rising powers like India are not merely rule-followers but rule-shapers, negotiating space security and sovereignty amid structural inequalities in global regimes.

Purpose and Relevance of the Study

India's space programme has evolved from developmental objectives to a multifaceted agenda encompassing strategic autonomy, commercial innovation, and geopolitical significance. As the global order in outer space becomes increasingly contested—marked by militarization, technological rivalry, and governance gaps—India's assertive presence reflects a shift in its foreign policy orientation and national priorities. The purpose of this study is to critically analyze India's pursuit of space sovereignty, situating it within the broader frameworks of strategic autonomy, international diplomacy, and space governance.

This research is relevant for three key reasons. First, it provides a political science perspective on India's transition from a normative actor to a strategic stakeholder in outer space, engaging with both cooperative and competitive paradigms (Stroikos, 2022; Rajagopalan, 2011). Second, it examines how India's space policy aligns with its foreign policy goals—particularly in the context of emerging strategic partnerships such as the Quad, and its increasing participation in global space governance regimes (Tellis, 2006; Rajagopalan, 2021). Third, it highlights the implications of India's space ambitions for regional stability, norm development, and technological self-reliance, especially in light of evolving dynamics with China and other spacefaring powers (Pant & Gopalaswamy, 2008; Stroikos, 2023).

Through this inquiry, the study contributes to academic discussions on the politics of technology, international relations of space, and India's role as a rising power. It bridges theoretical debates and empirical realities, offering insights into how a developing state like India navigates the balance between peaceful exploration, security imperatives, and strategic prestige in the evolving space order.

Historical Background

India's journey into the realm of outer space is deeply rooted in its post-independence aspirations of scientific self-reliance, technological modernity, and national development. The origins of India's space programme can be traced to the visionary leadership of Dr. Vikram Sarabhai, who articulated a developmental philosophy that linked space technology to socio-economic progress. Sarabhai envisioned the use of satellites for communication, meteorology, resource management, and education, emphasizing peaceful and civilian applications of space for nation-building (Sarabhai, 1974; Siddiqi, 2015).

During the early Cold War period, India remained committed to non-alignment while actively participating in scientific collaborations through international forums such as the International Geophysical Year (Kochhar, 2008). This phase was characterized by modest ambitions, reflected in the establishment of the Indian National Committee for Space Research (INCOSPAR) in 1962 and the subsequent creation of the Indian Space Research Organisation (ISRO) in 1969. Despite geopolitical tensions, India opted for a cooperative stance, engaging with countries like the USSR and the United States for technology transfers and satellite launches (Reddy, 2008; Sheehan, 2007).

The 1975 launch of Aryabhata, India's first satellite, marked a turning point, asserting India's capabilities on the global stage. Over the decades, India's space programme gradually matured through indigenous developments such as the Satellite Launch Vehicle (SLV), Indian National Satellite System (INSAT), and Indian Remote Sensing (IRS) satellites. These achievements reflected a blend of self-reliance and strategic autonomy, consistent with India's foreign policy posture (Rao & Radhakrishnan, 2012; Aliberti, 2018).

The post-1990s liberalization era brought new challenges and opportunities, as India expanded its space engagements beyond development to include strategic interests. The successful launches of Chandrayaan-1 (2008) and Mangalyaan (2013) not only demonstrated technical prowess but also elevated India's status as a responsible and ambitious spacefaring nation (Bagla & Menon, 2014; Amos, 2014). Simultaneously, India responded to growing regional and global threats by integrating military dimensions into its space programme, culminating in the 2019 anti-satellite (ASAT) test and the creation of defense-oriented institutions (Rajagopalan, 2011; Stroikos, 2023).

Thus, India's space trajectory, shaped by historical shifts in science, policy, and geopolitics, reflects a complex interplay between peaceful intent and strategic necessity. It lays the foundation for understanding India's evolving approach to space sovereignty in the 21st century.

Theoretical Framework

This study is situated at the intersection of international relations theory, strategic studies, and science and technology politics, employing a multi-theoretical framework to interpret India's evolving space policy. The relevance of theory in this context lies in unpacking the strategic, normative, and technological dimensions of India's pursuit of space sovereignty.

Realist paradigms provide foundational insight into India's behaviour in outer space as a function of power politics and national interest. In the anarchic global order, India's space ambitions reflect traditional realist objectives of self-preservation, deterrence, and competitive balancing—particularly in response to the technological advancements of peer rivals such as China and the United States (Johnson-Freese, 2007; Rajagopalan, 2011). Realism explains the development of India's anti-satellite (ASAT) capabilities, its military-space integration, and its increasing investment in space-based surveillance and defence infrastructure (Stroikos, 2023).

Simultaneously, Constructivist theory enables the study to move beyond material interests to consider the ideational and identity-based drivers of India's space engagement. India has actively framed its space program as a peaceful, developmental initiative rooted in postcolonial aspirations and scientific modernity (Sarabhai, 1974; Siddiqi, 2015). Through participation in international institutions such as the United Nations Committee on the Peaceful Uses of Outer Space (UNCOPUOS) and cooperative missions like the South Asia Satellite, India projects an image of a responsible space power (Stroikos, 2024). Constructivist perspectives help interpret how normative legitimacy and identity-shaping inform India's international space diplomacy.

Moreover, India's space strategy is deeply embedded in the doctrine of strategic autonomy, a central tenet of Indian foreign policy (Pant & Gopalaswamy, 2008; Tellis, 2006). Strategic autonomy enables India to navigate between normative multilateralism and pragmatic bilateralism—preserving independence while forming issue-based coalitions and technological partnerships. This doctrine shapes India's dual-track approach to space policy: aligning with liberal principles of peaceful use and sustainability while safeguarding its sovereign and strategic interests (Rajagopalan, 2021; Prasad & Rajagopalan, 2020).

In sum, the theoretical framework blends realism's power-politics logic, constructivism's attention to norms and identity, and the strategic autonomy doctrine to critically assess India's quest for space sovereignty. This triangulated approach is essential to understanding how India balances technological capability, normative legitimacy, and geopolitical interest in the contested domain of outer space.

Legal and Policy Frameworks Governing Outer Space: Global and Indian Perspectives

The governance of outer space is primarily guided by a set of international treaties led by the 1967 Outer Space Treaty, which enshrines key principles such as non-appropriation, peaceful use, and freedom of exploration. These are further reinforced by supplementary agreements like the Rescue Agreement (1968), the Liability Convention (1972), and the Registration Convention (1975), which collectively aim to establish a cooperative and peaceful space regime (Tannenwald, 2004; Stroikos, 2022). However, these frameworks remain limited in enforcement mechanisms, leaving significant gaps in the regulation of dual-use technologies and space-based military activities (Johnson-Freese, 2007; Weeden & Samson, 2022).

Militarization of space, especially through anti-satellite weapons and space-based surveillance, has increasingly challenged the foundational norms of the space treaties. The absence of a binding global consensus on space weaponization, combined with major powers investing in offensive capabilities, has exposed the vulnerabilities of the current legal architecture (Rajagopalan, 2011; Stroikos, 2023).

India's legal and policy position aligns broadly with international norms. It is a party to all major space treaties and an active participant in the United Nations Committee on the Peaceful Uses of Outer Space (UNCOPUOS). India consistently advocates for equitable access, non-weaponization, and responsible behavior in outer space (Permanent Mission of India, 2022; Stroikos, 2024). Nevertheless, India's 2019 anti-satellite (ASAT) test signified a strategic shift—asserting deterrence posture while officially maintaining a commitment to non-aggressive space use (Madhumathi, 2019; Rajagopalan, 2021).

Domestically, India has operated its space program largely under executive authority, with ISRO spearheading both civil and strategic missions. The Indian Space Policy 2023 marks a turning point by institutionalizing legal mechanisms to regulate satellite licensing, launch activities, and private participation (Prasad & Rajagopalan, 2020). The establishment of IN-SPACe (Indian National Space Promotion and Authorization Center) and NewSpace India Ltd (NSIL) aims to create a transparent, investor-friendly ecosystem while upholding national interest (Ramesh, 2020).

These developments underscore India's dual-track approach to space governance—upholding global norms while securing national sovereignty and strategic autonomy. The evolution of both international and national frameworks will significantly shape the future trajectory of India's space engagement.

India's Strategic Autonomy in Space: Foreign Policy Dimensions of the Space Program

India's space program is a key pillar of its aspiration for strategic autonomy, international recognition, and regional leadership. While rooted in peaceful development objectives, India's space trajectory has progressively aligned with its foreign policy interests, revealing a sophisticated intersection of science, sovereignty, and diplomacy (Sarabhai, 1974; Siddiqi, 2015). This transition mirrors India's broader approach to global governance—prioritizing independence in decision-making while engaging selectively with great powers to bolster national capabilities.

India's quest for strategic autonomy in outer space reflects its refusal to become dependent on dominant space powers or multilateral regimes that may constrain its sovereign decisions. Historically, this position emerged from the country's experience with technology denial regimes like the Missile Technology Control Regime (MTCR), which catalyzed India's resolve to build indigenous capabilities (Pant & Gopalaswamy, 2008; Mistry, 2001). Space thus became a domain of self-assertion and technological nationalism.

From the Chandrayaan and Mangalyaan missions to the ASAT test in 2019, India has leveraged space achievements to reinforce its status as a responsible yet capable actor in the international system (Aliberti, 2018; Rajagopalan, 2011). These efforts serve both symbolic and strategic purposes—enhancing India's bargaining power in global forums, and projecting deterrence amid intensifying space competition, especially with China (Stroikos, 2023; Johnson-Freese, 2007).

India's space diplomacy exemplifies this duality. On one hand, India participates actively in institutions like UNCOPUOS and promotes norms such as peaceful use and sustainability (Stroikos, 2022). On the other hand, it strategically deepens bilateral cooperation with key powers—including the U.S., France, and Japan—through data-sharing agreements, joint missions, and space security dialogues (Rajagopalan, 2021; Tellis, 2006; Lele, 2015). These collaborations reflect a hedging strategy that sustains autonomy while expanding strategic depth.

The South Asia Satellite is a clear instance where foreign policy and space capability converge. This initiative reinforced India's regional leadership and countered China's growing space influence in South Asia, demonstrating how satellite diplomacy can extend influence without coercion (Stroikos, 2024; Set, 2017). Similarly, India's increasing participation in Quad-led space cooperation illustrates how emerging alignments are shaping a rules-based Indo-Pacific space order (White House, 2021; Rajagopalan, 2021).

India's strategic autonomy is further supported by the liberalization of its space economy. The Indian Space Policy 2023, institutional mechanisms like IN-SPACe and NSIL, and the growth of startups such as Skyroot and Agnikul signify the state's intent to integrate innovation, commercial viability, and national interest (Prasad & Rajagopalan, 2020; Ramesh, 2020). This hybrid model underscores India's desire to become both a competitive player and a rule-shaper in the evolving global space economy.

In essence, India's space policy embodies a layered strategic calculus—asserting sovereignty, shaping global norms, leveraging soft power, and ensuring resilience in a contested domain. As outer space becomes a geopolitical frontier, India's space program offers a unique case of how a rising power blends science and statecraft to craft an independent yet globally relevant foreign policy identity.

Challenges to India's Space Sovereignty

India's ascent as a credible space power is met with multifaceted challenges that test its aspirations for strategic autonomy and sovereign control over outer space operations. These challenges emerge from the intersection of geopolitical rivalries, technological dependencies, legal ambiguities, and domestic institutional constraints.

One of the foremost challenges is the intensifying strategic competition in outer space, particularly with China's rapid militarization and technological advancements in the space domain. Beijing's successful anti-satellite (ASAT) test in 2007 catalyzed a regional security dilemma, prompting India's own ASAT demonstration in 2019 under "Mission Shakti" (Rajagopalan, 2011; Stroikos, 2023). While the Indian test marked a shift in doctrine from purely civilian use to space deterrence, it also exposed India to critiques on space weaponization and debris generation, raising questions about its normative commitment to peaceful space utilization (Tannenwald, 2004).

Second, India faces significant technological and infrastructural gaps. Despite ISRO's commendable achievements, the country remains dependent on foreign vendors for critical space technologies such as cryogenic engines and advanced sensor payloads (Aliberti, 2018; Siddiqi, 2015). Furthermore, delays in programs like Gaganyaan and setbacks in launch vehicle developments indicate persistent gaps in project management and R&D investment, which undermine India's ability to compete with established and emerging space powers.

Third, the fragmented global legal and regulatory framework complicates India's pursuit of space sovereignty. The Outer Space Treaty (1967) lacks enforceable mechanisms for dispute resolution, fails to address militarization clearly, and offers little guidance on the commercialization of space (Stroikos, 2022; Rajagopalan, 2021). In the absence of binding multilateral norms, India must navigate an environment where powerful actors, particularly the U.S. and China, shape space governance through bilateral and plurilateral arrangements, often sidelining emerging powers.

Fourth, the increasing privatization and commercialization of space in India also present regulatory and strategic challenges. The creation of IN-SPACe and the liberalization of space policy in 2023 signal a shift toward a market-driven model (Prasad & Rajagopalan, 2020). However, the balance between innovation, national security, and regulatory oversight is still evolving. The risk of dual-use technology proliferation and cyber vulnerabilities in private sector engagements pose new security dilemmas.

Finally, India's space diplomacy is constrained by its limited participation in global rule-making platforms and export control regimes. Although India engages in bilateral partnerships with France, the U.S., and Quad countries, its exclusion from elite space blocs such as the Artemis Accords or the Wassenaar Arrangement on space technologies restricts its influence in shaping the global space order (Tellis, 2006; Stroikos, 2024). This strategic marginalization hinders India's ability to translate technological success into normative leadership.

In sum, India's quest for space sovereignty is confronted by geopolitical tensions, technological dependencies, legal uncertainties, and domestic-regulatory transitions. To sustain its rise as a responsible and autonomous space power, India must adopt a holistic approach—strengthening indigenous capabilities, enhancing global rule-making participation, and integrating strategic foresight into its space policy.

Opportunities and Future Trajectories of India's Space Sovereignty

India's space sector is on the cusp of a strategic transformation, marked by both emerging opportunities

and evolving trajectories that reinforce its quest for space sovereignty. As global competition in outer space intensifies, India's proactive and multi-pronged approach positions it as a key player in shaping a multipolar and inclusive space order.

One of the most significant opportunities lies in commercial space expansion. The Indian Space Policy 2023, the creation of IN-SPACe (Indian National Space Promotion and Authorization Center), and increased private participation through startups like Skyroot and Agnikul represent a shift from a state-dominated model to a public-private hybrid framework (Prasad & Rajagopalan, 2020; Ramesh, 2020). This move not only democratizes space innovation but also enhances India's industrial base and economic competitiveness in the global space market.

Strategic diplomacy and international cooperation also offer critical pathways. India's engagement with multilateral frameworks such as the UN Committee on the Peaceful Uses of Outer Space (UNCOPUOS), as well as bilateral and plurilateral collaborations with countries like the U.S., France, Japan, and members of the Quad, reinforce its status as a norm entrepreneur in space governance (Stroikos, 2024; Rajagopalan, 2021; Mohan & Chan, 2018). These partnerships enable India to access advanced technologies while shaping rule-based mechanisms aligned with its strategic autonomy.

In terms of space security, India's development of indigenous capabilities such as the anti-satellite (ASAT) weapon, Defence Space Agency, and Project NETRA signify a credible deterrent posture in a domain vulnerable to emerging threats (Stroikos, 2023; Rajagopalan, 2011). These developments indicate that India seeks to balance peaceful uses with necessary militarization to safeguard its sovereign interests.

Looking ahead, scientific missions and exploration offer opportunities for soft power projection and international prestige. Missions like Gaganyaan (India's human spaceflight mission), Aditya-L1 (solar observatory), and prospective lunar and interplanetary explorations underscore ISRO's evolving capabilities and ambition (Amos, 2014; Times of India, 2023).

India's future trajectory must also consider challenges such as space debris management, policy harmonization between civilian and defence agencies, and aligning commercial growth with strategic oversight. A sustainable governance model—anchored in innovation, legal clarity, and international engagement—will be essential to sustain India's rise as a responsible space power.

In conclusion, India's future in outer space is not merely a technological aspiration but a geopolitical strategy. By combining strategic foresight, diplomatic agility, and technological resilience, India is well-positioned to carve out a sovereign yet collaborative space identity in the evolving global order.

Challenges to India's Space Sovereignty

Despite remarkable progress, India's pursuit of space sovereignty faces several critical challenges that complicate its strategic, legal, and institutional goals. These challenges are both external—emerging from the shifting global space order—and internal, shaped by domestic limitations in resources, regulation, and coordination.

Although India supports a rule-based international order, the current outer space governance framework—anchored in the 1967 Outer Space Treaty—has become outdated and insufficient to regulate modern

1. Fragmented Global Governance and Normative Gaps

challenges such as space weaponization, satellite mega-constellations, and dual-use technologies (Tannenwald, 2004; Johnson-Freese, 2007). In the absence of binding mechanisms to prevent arms races or clarify space property rights, India's normative commitment is constrained by geopolitical competition and legal ambiguity (Stroikos, 2022).

2. Strategic Competition and Space Militarization

India's peaceful space posture is being tested by rival powers' military space capabilities. China's space advancements—including its ASAT test and growing satellite infrastructure—compel India to balance its commitment to non-weaponization with national security imperatives (Rajagopalan, 2011; Pant & Gopalaswamy, 2008). The increasing possibility of offensive actions against space assets has made space a contested security domain, prompting India's creation of the Defence Space Agency and Project NETRA (Stroikos, 2023; Madhumathi, 2019).

3. Limited Defence-Civil Synergy

India's institutional separation between ISRO (civilian) and military space agencies leads to challenges in data sharing, operational coordination, and dual-use technology development. Unlike integrated models in the U.S. or China, India's fragmented approach delays the development of robust space situational awareness and deterrence strategies (Reddy, 2008; Prasad & Rajagopalan, 2020).

4. Regulatory and Policy Challenges

The Indian Space Policy 2023 represents a significant reform, but its implementation is still evolving. Issues such as licensing procedures, liability frameworks, spectrum allocation, and private sector regulation remain partially addressed (Ramesh, 2020). For India to emerge as a space commercial hub, regulatory clarity and institutional support are essential.

5. Resource Constraints and Technological Gaps

India's space budget, although steadily increasing, is modest compared to global leaders. Delays in launch vehicle development (e.g., GSLV Mk III), limited human spaceflight experience, and dependence on foreign suppliers for critical components constrain India's full spectrum capabilities (Bagla & Menon, 2014; Siddiqi, 2015).

6. Space Debris and Sustainability Concerns

India's expanding space presence increases its vulnerability to space debris. Although Project NETRA seeks to improve space situational awareness, India requires greater international cooperation and indigenous capability to mitigate orbital congestion and enhance long-term sustainability (Stroikos, 2022; Rajagopalan & Narayan, 2020).

In sum, these challenges underline the complexity of balancing ambition with responsibility. For India to assert space sovereignty effectively, it must not only strengthen its technical and policy frameworks but also navigate a turbulent geopolitical environment with strategic foresight and institutional coherence.

Policy Recommendations:

India must adopt an integrated policy framework that synchronizes civilian, commercial, and military space efforts under a national doctrine to avoid duplication and enhance resilience. India should take a leadership role in proposing and supporting legal mechanisms that prevent weaponization of outer space, while safeguarding its own security interests. Greater collaboration between ISRO, IN-SPACe, and private space startups can boost innovation while ensuring that strategic technologies remain within national control. India must deepen bilateral and multilateral engagements (e.g., with the Quad, France, and BRICS) to promote trust, build interoperability, and ensure equitable access to the global commons. Given the growing risks from space debris and anti-satellite threats, India should prioritize the expansion of its SSA systems, early warning infrastructure, and anti-jamming capabilities.

Conclusion

India's pursuit of space sovereignty is no longer limited to scientific aspirations or developmental imperatives—it is now deeply interwoven with the country's broader strategic ambitions, foreign policy doctrines, and national security architecture. As India transitions from a passive space actor to a norm-shaping, policy-assertive stakeholder, its approach reflects a hybrid model of cooperation and competition, development and deterrence, autonomy and alliance. This transformation is rooted in India's long-standing tradition of strategic autonomy and has evolved through a combination of technological self-reliance, diplomatic engagement, and normative leadership in global space governance.

India's assertiveness in space security—exemplified by the ASAT test and formation of defence-oriented institutions—demonstrates its growing recognition of outer space as a contested strategic domain. At the same time, India's active participation in multilateral fora such as UNCOPUOS and its commitment to the peaceful use of outer space indicate its balanced stance between realpolitik and liberal internationalism.

The study highlights that India's space programme now serves as a multifunctional tool—projecting power, fostering partnerships, enhancing prestige, and securing critical infrastructure. The emergence of private players and commercialization, supported by enabling policies like IN-SPACe and the Indian Space Policy 2023, underscores the state's evolving governance model. Yet, with these transitions come challenges of regulation, international accountability, and responsible behavior in an increasingly congested and militarized domain.

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