Chapter 7
India's National Security Space Policy

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Introduction

India's space programme has gone through an impressive journey in the last nearly six decades. As a developing country, with limited resources, India began its space programme with an initial focus on the social and economic development of the country, but in recent decades, it has had to re-orient and expand its space programme with a focus on security needs more than ever in the past. Also, as India's interests grow more international and become a more influential player in global politics, its approach to security issues has also undergone some changes. Further, there is interest among international players to understand India's evolving approach and how it positions itself on critical international security issues. Space is one such domain where some of the changes are becoming more evident, shifting from a purely civilian space orientation to one with greater attention to military and security facets, given the rapidly changing space security conditions.

Some of the key factors driving the change in the Indian approach to space include changing threat scenario within the space domain and the broader shifting global balance of power, which is evident in the Indo-Pacific regional power balance as well.

Progression of India's Space Programme and Approach

In some ways, the Indian space programme has gone through transformative changes in recent years, if one were to compare the earlier Indian position, which was vehemently critical of the US' Strategic Defense Initiative and the anti-satellite (ASAT) tests conducted by the US and USSR in the 1970s and 1980s. India's position has evolved in a way, transitioning from a morality and principle-based position to one that is conditioned by pragmatism and national security interests. This in effect means India is no longer tied to its decades-old position that opposed any kind of militarisation of space and that space utilization is for peaceful purposes alone. This is not to suggest that India has entirely given up on its official rhetoric as yet, but on the ground, the military utilities of the Indian space programme have grown and will continue to grow in the coming years.

One has to acknowledge that this has not been an easy shift for India, but the change to the Indian approach has been gradual and evolving. India's position today is a lot more calibrated and considered and aligns more with its broader approach to global security norms itself, which has also seen certain loosening up.

The Indian space programme as it began in the 1960s was a fairly modest one with limited goals and even more limited resources, and it was primarily geared towards the social and economic development of the country. But India has had to expand the space agenda with new considerations from a national security angle. China's gaining of greater proficiency in space is something that has put many spacefaring powers including India, Japan and the US on notice. Even as China continued with the rhetoric of peaceful uses of outer space, there has been a flourishing military space programme under the PLA's (People's Liberation Army's) leadership, in reality. Introduction of ASAT weapons in the Indo-Pacific neighbourhood by China in January 2007 and China's repeated tests since then add to the regional anxieties and competition. Irrespective of the logic for China's pursuit of new weapon systems, because they have a larger economy kitty that permits them to do so or due to their own perceived security calculations, countries in the Indo-Pacific neighbourhood perceive these as threatening to their own security and destabilizing in the regional context. The baggage of history and the great power politics in the region are in addition accelerating the security dilemma in the region.

ASAT weapons are inherently destabilizing in nature, and the January 2007 ASAT test in fact pushed a new debate within India on how India must approach outer space including the need to develop new counter-space capabilities to protect its own assets in outer space. India's growing security concerns, especially those related to China, including an array of counter-space capabilities, appear to be driving much of the new focus of India's space programme. But this new orientation has also brought India in closer alignment with a new set of actors who are becoming critical to India as it shapes new space security partnerships.

A second change in India's space programme relates to a more determined space exploration, which includes inter-planetary missions and the goal to establish a small space station in the coming decade. This change appears to be a natural progression as the Indian space programme has reached certain levels of technological maturity and sophistication. But this paper will focus on the first aspect, relating to the national security aspects of India's space programme and policy. However, it should be noted that while India's Moon and Mars missions have been an outgrowth of the growing technological capabilities, the intensifying space security and the broader Asian competition have

been factors that pushed India towards such missions. Also, because these missions have boosted the visibility and profile of the Indian space programme, they highlight India's potential role as a space collaborator. Thus, there has been a small commercial angle that has been key in pushing India to undertake such complex missions despite operating with a tiny budget. Of course, these complex missions have also produced spin-off technological benefits for India. India's deep space communication capabilities is a case in point. Finally, India has held the view that demonstration of such missions has also an instrumental value in augmenting India's voice in the global governance debates with a seat at the high table.

Competitive Asian Space Landscape

Indo-Pacific in general, and the three established space powers – India, China and Japan – have actively collaborated with other space powers including the US, France and Russia, but intra-regional collaboration has been minimal or nil. While India and Japan have established space cooperation across different facets, cooperation of the two with China has been practically nil due to the fact that these programmes have been driven with a sense of geopolitical competition and rivalry. Also, one cannot overlook the fact that there are two regional space organisations: APSCO (Asia-Pacific Space Cooperation Organization) under the Chinese leadership and APRSAF (Asia-Pacific Regional Space Agency Forum) under the Japanese leadership, each with their respective member countries, with very little overlap, and there exists no mechanism for cooperation between these two regional initiatives. This demonstrates the competitive tone and tenor of the two groupings and their broader goals within the regional and broader context. India and South Korea are part of the APRSAF and Pakistan is a member of the APSCO.

Many of the Asian space players have developed their space programme with an economic rather than security agenda but are increasingly making crucial departures with the security environment becoming not so benign. There is a sense that inaction could cost them, with implications for their national security. In both of India and that of Japan, the changes are becoming more prominent, with the two developing certain military profiles to their space programmes and developing appropriate technologies and institutions to make efficient use of space in the national security context. The two countries also collaborate both in the bilateral context but also within the regional and minilateral context with a focus on space security. India and Japan for instance are involved in an annual space security dialogue.

India's National Security-Driven Space Progression

While there has been an overall expansion of India's space programme, its national security dimensions have become quite significant given the growing military and security drivers in the Indo-Pacific and beyond. Considering the emerging security trends, India and many of its new security partners in the region will continue on the path to build up their deterrence capabilities in space even as deterrence in space is yet to become a state policy. Lack of substantial multilateral negotiations can accelerate the pace towards deterrence in space, something that can be avoided, but we are losing time.

India has been a bit slow in bringing about the policy changes, but it has been active in terms of the various capability requirements, which have been practically beneficial. For instance, some of India's earliest military satellites such as the RISAT series, have been useful in augmenting Indian military's situational awareness. The RISAT series of satellites, with synthetic aperture radar (SAR) have been particularly beneficial to the Indian military. The RISAT series of satellites gained greater traction in the context of the Mumbai terrorist attacks in November 2008, when India acutely felt the need for all-weather surveillance satellites that could provide India's security agencies with security updates, especially for its eastern and western fronts.

One of the first dedicated military satellites that India developed was the GSAT-7 for the Indian Navy in August 2013. The satellite was meant to boost India's space-based maritime communications and electronic intelligence. This made perfect sense given that the Navy operates in far-flung operational theatres from the Indian mainland and was seen as particularly important in the context of changing security dynamics in the Indian Ocean. Since then, India has developed a number of communication satellites for the other two services of the Indian military including GSAT-6, GSAT-7A in order to have enhanced and secure communications and to facilitate better coordination in the context of military operations. In 2019, the ISRO, (Indian Space Research Organisation) went on to launch EMISAT (Electro-Magnetic Intelligence Satellite), a satellite jointly manufactured by ISRO and the Defence Research and Development Organisation (DRDO). This satellite was developed for the Indian military with the objective of improving the military's ability to track and intercept enemy radars by sensing electromagnetic rays they emit.

India has also developed a smaller version of the GPS for its navigational requirements, which has been reportedly helpful to the Indian military in their operations, without having to depend on foreign navigational programmes. India has considered foreign dependence as a vulnerability given its historical experience of relying on foreign partners

for its broader security needs.

In addition to stepping up its technological wherewithal, India has also established the necessary institutions for effective coordination between the civilian and military agencies, thus paving way for seamless utilisation of space capabilities. One of the first institutions was the Integrated Space Cell under the Integrated Defence Services Headquarters of the Ministry of Defence (2010). This was considered the baby step in creating effective coordination between the Department of Space and the Indian armed forces in creating better synergies in a variety of ways. Specifically, the new set up was meant to be helpful in generating a common understanding of the emerging threats that India faces as well as consider possible responses to "offensive counter space systems like anti-satellite weaponry, new classes of heavy-lift and small boosters and an improved array of Military Space Systems ... in our neighbourhood." It was an important first step, but it did not really evolve in terms of effectiveness and delivery.

Next, among the three services, the navy took the lead in establishing the Indian Navy's Assistant Chief of Naval Staff (Communications, Space and Network Centric Operations or ACNSCSNCO) in 2012. In 2015, it seemed like the Indian government was onto more institutional innovations with the Ministry of Defence said to be finalising the final steps towards the establishment of three tri-service commands – cyber command under the Indian Navy, aerospace command under the Indian Air Force and the special operations command under Indian Army. However, in place of full-fledged commands, three interim organisations – Defence Cyber Agency (DCA), the Defence Space Agency (DSA) and the Special Operations Division (SOD) – evolved gradually with the DSA established towards the end of 2018. Many consider this as an institutional innovation that might lead to a full-fledged aerospace command, which has been a demand from the armed forces for more than two decades. Then Indian Air Force Chief, also the chairman of the chiefs of staff committee, Air Chief Marshal Arup Raha noted that these would remain as "interim arrangements" before the establishment of the full-fledged commands. It is seven years since the DSA was set up, and the integration of space in military affairs has become greater but there is no sign of a full-fledged command as yet.

India's Changing Policy Approach to Space

India announced a national space policy for the first time in 2023, although it is fairly limited and has several lacunae especially from a space security perspective. The 2023 policy appears to be more like a guidance document for start-ups and new space industries

to engage the Indian space establishment. It outlines roles and responsibilities of the ISRO, NewSpace India Limited (NSIL), and the Indian National Space Promotion and Authorization Center (IN-SPACe), as well as that of the private players in furthering the Indian space agenda. It is indeed important in the sense that it acknowledges the critical role that private entities can play, thus opening up the Indian space sector in a more straightforward fashion. That there is a clear recognition of the private sector in stepping up India's competitiveness is noteworthy. Giving the private sector a bigger role can also mean that the ISRO should be better placed to go back to its original mandate of focusing on research and development of advanced space technologies, space exploration and non-commercial missions. However, looking at the rapidly changing space security scenario, the Indian government lost an opportunity to outline its vision on space security issues and its perspective on how India plans to counter the growing space security threats. Until the Indian government announced this policy in 2023, one had to go with official statements in the Indian Parliament and in multilateral fora such as the United Nations to understand India's space leanings.

Even as India did not spell out anything worth on the space security policy aspects, there have been subtle changes over the years in how India has approached space in the security context. India in the past decades had adopted a doctrinaire approach or a sanctuary school of thought to space security issues, which reaffirmed that space must be used for peaceful purposes alone and strongly opposed militarisation and weaponisation of space. And accordingly, as mentioned earlier, India was a vocal critic of the US and USSR through the Cold War years for their military space programmes and repeated ASAT tests. The Indian position of course made sense given that India had no such capabilities and therefore criticised those who possessed them.

But India's position began to see some important changes in the 2000s. One can attribute many reasons for the subtle changes in India's approach, but an important consideration was India's desire to integrate with the global non-proliferation architecture and be part of the solution than be part of the problem, which was the perception in the preceding decades. A second important factor was the changing security environment in its neighbourhood, wherein Pakistan was the initial focus, but by the late 1990s, the threat focus had shifted to China. The China-Pakistan partnership that spanned a number of areas including Beijing's transfer of small- and medium-range missiles to Pakistan and the broader missile proliferation in the region were particularly concerning. All of these were imperatives for India to adopt a new thinking on space and missile defence issues. These changes also softened India's rhetoric considerably and India's stance on military space

and missile defence issues became more considered and nuanced.

While India's policy approach towards space has evolved considerably since the 1970s and 1980s, it is yet to embrace the full change and goes back every now and then to its old comfortable position that space is for peaceful purposes alone. Given the politicised nature of space debates, and despite the Indian ASAT demonstration, India tends to hold a moralistic argument and principled position on space security issues. This is evident in the global governance aspects of space security. India is yet to totally endorse political instruments such as Transparency and Confidence Building Measures (TCBMs). India still continues to hold the view that they are good supplementary measures, but that they cannot replace legally binding instruments.

Dealing with Space Security Threats

India's space security environment has been worsening for about two decades now. China's first successful ASAT test in January 2007 was a wake-up call to India on the kind of threats in its own neighbourhood and that India should be prepared to address. This in fact prompted the Indian establishment across the board, the political, technical and military leadership, to discuss and debate on how India should develop the means to protect its own space assets. In a unique fashion, there was a consensus view that India must develop appropriate measures as a way to deter any attacks on its space assets. The Manmohan Singh Government in fact sanctioned the research and development of India's own ASAT capability even though the government did not decide on when to have a demonstrated capability. The decision to demonstrate India's ASAT capability was taken by Prime Minister Narendra Modi in March 2019. The decision was possibly conditioned by India's experience in the nuclear domain with the Nuclear Non-proliferation Treaty (NPT). India wanted to ensure that it had a demonstrated ASAT capability before any NPT-like global mechanism on space security came about given that the three established space powers – the US, Russia and China – had already demonstrated ASAT capabilities, and it is possibly in their interest to prevent others from conducting ASAT tests. India was also possibly driven to assume that given the state of multilateralism and the worsening great power relations, strengthening or establishing new global governance measures was not going to be a reality and therefore it felt the need to have its own capabilities in place to deter others from blowing up India's space assets. This sentiment was captured in a statement issued by the Ministry of External Affairs, which said that the new capability "provides credible deterrence against threats to

our growing space-based assets from long range missiles."

India's ASAT test was again not an easy decision given that it was walking away from a well-established decades-old position against militarisation of space. It would have been a strange decision also because India was a vocal critic against the US and the Soviet Union for their military space programmes, including their ASAT tests. But ultimately, the national security considerations became the essential drivers for India to take the decision on its ASAT demonstration. There are of course questions around the deterrence value of the Indian ASAT in deterring China. But it appears to have sent a political message to China for the time being.

Meanwhile, the Indian defence research and development community appears to be keen on other counter-space weapons too. Then Director General of the DRDO, Dr. Satheesh Reddy in a newspaper interview said that the DRDO is "working on a number of technologies like DEWs (directed-energy weapons), lasers, electromagnetic pulse (EMP) and co-orbital weapons etc." He of course clarified that these are political decisions, but he stated that "space has gained importance in the military domain. The best way to ensure security is to have deterrence." This is in fact the language one hears from the military, especially the Indian Air Force leadership as well. The Air Force is also gearing to rename itself to the Indian Air and Space Force (IASF) in its efforts to make it a "credible aerospace power". One however needs to exercise a bit of caution while reading these statements. From bureaucratic politics to gaining access to funds, there are a number of such factors that can be read into these statements. This is not to suggest that the Indian establishment is not worried about the worsening space security conditions. In fact, it used to be a concern that the Indian establishment may not fully understand or appreciate the space security issues and the urgent measures that are required to counter them. But it no longer appears to be the case; space security especially in India's neighbourhood appears to have gained greater acknowledgement. Like mentioned before, China's ASAT test in 2007 was a game changer moment as far as India's space security thinking is concerned.

In fact, the Indian Defence Space Agency conducted its first military space exercise, "Antariksha Abhyas 2024," in New Delhi in November 2024. The exercise was conducted with the goal of further integrating space in India's military operations. Speaking on the occasion, Chief of Defence Staff General Anil Chauhan underlined that space "is now the critical enabler of India's defence and security apparatus. With its rich legacy of space exploration and growing military capabilities, India is well positioned to navigate the challenges posed to space based capabilities." In recent years, the military leadership has

become quite vocal on the use of space in the context of national security and military operations. The kind of hesitancy that prevailed in the past is not there anymore. The exercise involved personnel from the Defence Space Agency, army, navy, and the air force, along with other specialist branches and representatives from the DRDO and ISRO.

Capacity Constraints

While the Indian civil space organisation, the ISRO has done quite well, especially considering the small budget with which it operates, capacity issues are becoming more serious with the expanding space agenda. The military and security requirements on space assets have grown over the past decade and the ISRO is having to do a lot of catch up, but there are capacity constraints, which are beginning to impact on India's space security technology credentials. If India cannot keep pace with the fast-moving military space sector in India's neighbourhood and globally, New Delhi stands to lose in critical national security capabilities. Also, with both civil and military dependence on space go up, there will be a corresponding increase in the vulnerabilities to its space systems. India will need to factor in attempts by adversaries to create temporary disruptions, degrade or destroy Indian space assets through a range of counter-space capabilities including cyber and electronic warfare. This means that the already stretched Indian space programme also has to pay attention to developing counter-measures, including better redundancy measures and better resiliency to its space systems. These will only add to the growing and diverse requirements on the Indian space programme that is already dealing with capacity crunch.

India's capacity crunch is in multiple areas, each of which calls for a different response. The first factor that affects the capacity constraints comes from the small budget of the ISRO. With a budget around US$2 billion, India has done pretty impressive work, but this is far from sufficient for the growing demands on the Indian space programme and if India has to stay competitive and effective, the budgetary allocation has to be addressed. Without a hike in India's space budget, the ability of the ISRO to retain or attract new talent will be futile. There is a thriving private sector across the region and beyond and India will lose some of the best private sector talent to the West or even Asia, where they may be in demand.

A second area that India has to address is with regard to the constraints in the technological domain, especially in its ability to launch heavy satellites. This is an area in which India can work with partner countries to boost the launch vehicle capabilities so

that India becomes a competitive player in launching heavier satellites. The next section on space security partnerships delves into some of the details for making this happen.

A third area is to improve India's launchpad infrastructure, which has continued to impact on India's launch goals. Launch numbers have to go up to keep up with India's growing demand in addition to its ability to cash in on the global commercial space market. India enjoys certain advantages in terms of cost and reliability but the ability to keep with the increased number of launches is partly at least determined by the infrastructure in place, something that needs attention from the political and ISRO leadership.

A fourth and final area that India needs to pay attention to is the expansion of the workforce. A few years ago, ISRO admitted that it had only around 16,000 personnel, which was not sufficient to meet the expanding space agenda. Three years earlier in 2014, while responding to a question in the Indian Parliament on manpower shortages, Dr. Jitendra Singh, Minister of State in the Prime Minister's Office claimed that there was no manpower deficit. A quick way to address this is by bringing in the Indian private sector, which is a competent force and might at best need a bit of handholding by the government. In recent years, the Indian political and scientific leadership have acknowledged this critical step, and the private sector has found reasonable openings to work with the ISRO. But the embrace of the private sector needs to done on a faster pace if India does not want to lose to its competitors including China, who has embraced the private sector with both arms. Also, for the private sector to be an invested party, there has to be regulatory certainty and funding, without which attracting the best talent may not come to fruition.

Emerging Space Security Partnerships

With China and its space security prowess gaining greater traction in India's space security policy debates, India is looking to solidify partnerships with those like-minded countries who share similar perspectives on the growing space threats and also in how they might deal with those threats. In this regard, India has gone on to establish as well as strengthen space security partnerships with the Quad as a whole as well as with individual Quad countries and France. It is also interesting to note that India's first space security dialogue was with the US that began in 2015, and thereafter India entered into a similar dialogue format with Japan from 2019 and with France from 2021. In India's earlier approach to space, one would have envisioned India to have a space security conversation with

countries like Russia and maybe France but not the US and Japan. Thus, the changed space security conditions have driven a certain amount of pragmatism to acknowledge the like-mindedness in terms of threat perceptions in the space domain and the possible countries that India can work with in addressing the current and future security threats in space. India also has a strong space collaborative agenda with Australia, most of which fall in the civil and commercial space arena, but with growing reliance on space for our respective societies, economies and national security, it is a matter of time before New Delhi and Canberra will expand their conversation to include the space security agenda.

But all the three countries, alongside the US, are part of the Quad space engagements, which include consultations with each other on a range of issues including space norms to ensure that space is safe, secure and sustainable. The Quad as a whole is also engaged in consultations on norms of responsible behaviour and regulations, which has an emphasis on China's counter-space capabilities and behaviour. This is an interesting and important development especially from an Indian perspective because traditionally India partnered with the non-aligned G-21 countries which have insisted on legally-binding verifiable mechanisms as far as space global governance measures are concerned. For India to engage in a smaller grouping such as the Quad and collaborate on possible space norms is an important departure in India's space approach. But China's aggressive behaviour across terrestrial geopolitical issues and its inventory of counter-space capabilities have driven India to shed some of the hesitancies and develop like-minded partnerships that could be also a soft-deterrent measure. These trends are likely to continue into the future given the state of the play in multilateral institutions, and minilateralism may be the possible answer for the time being. If that be the case, Quad and other minilateral partnerships with like-minded countries in the Indo-Pacific and beyond could gain greater traction in the coming years. For India and its new security partners, it is also a way to develop technological responses to the multitude of space security threats by building better resilience and redundancy, thus minimizing disruptions and vulnerabilities. India and its space security partners need to also develop and enhance Space Domain Awareness (SDA) and thereby be better equipped to understand the space environment on all the threats including space weather and other intentional acts.

Having said that, there are areas that India needs to prioritize and be able to call out bad and irresponsible behaviour in space, as and when it happens. That India abstained from voting on the UN resolution to ban destructive direct-ascent ASAT weapon tests in December 2022 was a mistake that could have been avoided. Similarly, the Japan-US resolution that sought to reaffirm and extend critical norms against placing weapons

of mass destruction (WMD) in space was a critical one and India could have been an active party co-sponsoring such proposals. This proposal came in the backdrop of the US reports that Russia is possibly developing an electromagnetic pulse (EMP) weapon that involves setting off a nuclear explosion in space. Even if only to generate an EMP, such explosion can lead to indiscriminate destruction of a large number of satellites in addition to creating a huge amount of space debris. It goes without saying that these will impact multiple sectors from civilian and military communications to PNT (position, navigation and timing) services and ISR (intelligence, surveillance and reconnaissance) as well as a host of other functions. Also, it is true that Outer Space Treaty (OST) of 1967 already prohibits placement of WMD in space, but given the trends wherein states are increasingly breaking norms with impunity, it appears that these norms, whether they exist through legal or political measures, need to be reiterated and recommitted by states. Geopolitical competition in space has driven to such an extent that states are willing to forego their own commitments in place of achieving narrow political goals. Therefore, there is an urgent need to reiterate some of the existing norms in new pledges and agreements so as to ensure space remains safe and secure for future generations.

In addition to active collaboration on developing norms and ensuring that outer space activities are regulated even in a limited manner, India needs to further these collaborations also to augment India's launch vehicle capabilities as well as find other ways to cooperate so that India and its partner countries can corner the market with an emphasis on launching heavier payloads. These are not easy and there are legal and regulatory challenges, but it is in the interest of India and its new security partners to make conscious political decisions to effect some changes.

Conclusion

India is yet to have a comprehensive national space policy, but despite that, there has been an appreciation for the increasing stresses that the space domain is confronted with. This is reflected in the Indian capability developments as well as institutional innovations to adapt to the changing space security conditions. This has also brought out the appreciation for developing and nurturing space security partnerships with a number of like-minded partners including the United States, Japan, France and Australia. Some of the shifts that India has shown such as the Quad consultations on space norms will likely pick up momentum in the coming years as space security developments appear to be on a slippery slope. But there are areas in which India needs to give up its ambiguity

and adopt pro-active approaches in countering the growing space security threats.