

The background of the cover is a vibrant night sky filled with numerous stars of varying sizes and colors, including bright blue and white ones with prominent diffraction spikes. There are also soft, glowing nebulae in shades of orange and yellow. In the foreground, the dark silhouette of a castle with multiple towers and turrets is visible against the starry sky. The overall composition is vertical and centered.

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## India's Space Policy and National Security: Balancing Civilian and Military Uses of Outer Space

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### **Abstract**

India's space policy has always emphasized the use of outer space for scientific research, national security, and socio-economic development. This research paper explores India's space policy and its efforts to balance civilian and military uses of outer space while prioritizing national security. India's space program has grown significantly in recent years, with an increasing focus on developing indigenous technologies and applications. However, India faces several challenges in balancing its civilian and military uses of outer space, including the need for effective space-based surveillance and intelligence capabilities. This paper examines India's space policy and its implications for national security, including the role of space diplomacy in promoting international cooperation and collaboration in outer space activities. It also analyses the potential socio-economic benefits of India's space program, particularly in agriculture, healthcare, and disaster management. Through a comprehensive analysis of India's space policy and its challenges and opportunities, this paper aims to provide insights into the future of India's space program and its role in promoting national security and socio-economic development.

**Keywords:** Space Policy, National Security, Space Diplomacy, International Cooperation, Surveillance, Socio-economic Development.

### **Objective**

This research paper aims to analyse India's space policy and its implications for national security, focusing on balance between civilian and military uses of outer space. The paper examines the historical and contemporary context of India's space program, the role of space in national security, and the challenges and opportunities that India's evolving space policy presents. Through a comprehensive analysis of India's space policy, the paper aims to provide insight into India's space policy and the government's view on the military use of space.

### **Research Methodology**

The research is based on the doctrinal method of research. The research methodology for this paper will involve a combination of qualitative and quantitative methods. The study is based on a systematic review of relevant literature, including scholarly articles, books, reports, and official documents related to India's space program and its implications for national security.

### **Introduction**

The space industry is one of the world's fastest growing. With numerous successful launches and ambitious plans in recent years, India has emerged as a major player in the global space race. At the same time, India is confronted with a number of security challenges, including territorial disputes, terrorism, and geopolitical rivalries. As a result, the country's space policy

must strike a balance between civilian and military uses of space. In the coming years, New Delhi's space goals will most likely be driven by growing security concerns about China, including Beijing's growing counter-space capabilities. This is likely to result in a greater emphasis on national security aspects of India's space programme, as well as the formation of new space security partnerships. This article examines key aspects of India's space policy and national security, such as its strategic goals, institutional framework, and technological capabilities. We'll also look at some of the major challenges and opportunities that India faces in this area, as well as the implications for regional and global security. Ultimately, the article will argue that India's space policy must prioritize both civilian and military uses of outer space while also fostering international cooperation and dialogue to ensure space's peaceful and sustainable development for all.

### **India's Space Sector**

India's space programme dates back several decades. It has primarily been used for peaceful purposes, with several scientific and technological applications such as telemedicine, tele-education, disaster warning, search and rescue operations, mobile communications, remote sensing, and weather forecasting. Given India's enormous developmental challenges, it is always difficult to justify funding for space missions that have no direct impact on development. However, while military functions were not a primary focus of India's space programme until about a decade ago, they were always on the minds of decision-makers. From the program's inception, Jawaharlal Nehru, India's first post-independence prime minister, and Vikram Sarabhai, the father of India's space programme, recognised the importance of space to India in the national security domain. Nevertheless, India did not focus much on the security applications of outer space until 2007.

The Indian Space Research Organisation (ISRO) is the Indian space agency in charge of spacecraft launches and space research. The public agency was established in 1969 and has remained India's sole major player in the sector, owing to the fact that it is the only entity with the authority to launch spacecraft. It launched its first satellite, Aryabhata, on April 19, 1975, and has since developed its own fleet of launch vehicles. ISRO has placed an orbiter around Mars and helped confirm the presence of water on the moon. The agency attempted to land a rover on the moon in 2019, but the mission was hampered when the lander failed to achieve a "soft landing" and crashed. ISRO has also launched hundreds of satellites in space. These include both foreign and indigenous satellites—many of the latter are operated by ISRO. Commercially, a total of 328 foreign satellites from 33 countries have been successfully launched onboard the Polar Satellite Launch Vehicle (PSLV). Revenue earned through these launches is \$25 million and €189 million. These launches were done through contracts that were signed with the commercial wing of ISRO known as Antrix Corporation Ltd. Antrix markets the products of the Indian space programme to foreign countries. In 2019, the Government of India established The New Space India Ltd. (NSIL), whose purposes are almost identical to Antrix.<sup>15</sup>

### **Current Space Law in India**

The Indian Space Research Organization Act of 1969, which established the Indian Space Research Organization (ISRO) as the country's primary space agency, governs India's current space law. The act charges ISRO with conducting research in space science, technology, and applications, as well as developing and operating space-based assets. In addition to the ISRO Act, India has ratified several international space treaties, including the 1967 Outer Space Treaty, the 1968 Rescue Agreement, the 1972 Liability Convention, and the 1976 Registration Convention.

<sup>15</sup> <https://rsrr.in/2021/03/01/space-policy-isro-in-space-privatisation/>

The Outer Space Treaty of 1967, which India ratified in 1982, is one of the most important international agreements related to space law. It prohibits the placement of nuclear weapons and other weapons of mass destruction in outer space and requires that outer space be used for peaceful purposes. It also requires that states carry out their space activities in a manner that avoids harmful interference with the actions of other states.<sup>16</sup>

The Rescue Agreement of 1968, which India ratified in 1982, establishes the legal framework for the rescue and return of astronauts and the return of space objects to their launching state. The Liability Convention of 1972, which India ratified in 1982, establishes the legal framework for liability for damage caused by space objects. It requires that launching states be held liable for damage caused by their space objects and provides compensation for victims of space-related accidents.

The Registration Convention of 1976, which India ratified in 1983, requires that all space objects launched into Earth orbit or beyond be registered with the United Nations. This helps to ensure that space activities are transparent and accountable and that the activities of different states can be coordinated to avoid collisions and other accidents.<sup>17</sup>

In addition to these international treaties, India has also developed its national policies and regulations related to space law. These include the Indian Remote Sensing Policy of 2011, which establishes the legal framework for using remote sensing data for various applications, and the Space Activities Bill of 2017, which seeks to regulate the activities of private sector entities in the space sector.

### **Key Pillars of India's Space Policy**

1. Strategic autonomy: India's space policy recognizes the importance of strategic autonomy in national security, which includes the ability to develop and operate its own space-based assets. This pillar is crucial for ensuring that external factors do not compromise India's security interests.
2. Military applications: Another key pillar of India's space policy on national security is the development of military applications of space technology. This includes using satellites for intelligence gathering, reconnaissance, surveillance, and early warning of potential security threats.
3. Dual-use technology: India's space policy also recognizes the potential for dual-use technology, which can have both civilian and military applications. This pillar helps leverage space technology's benefits for national security and civilian applications.
4. International cooperation: India's space policy also emphasizes the importance of international cooperation and collaboration, particularly in space security and military uses of space technology. This includes sharing information, joint exercises, and partnerships with other countries and international organizations.
5. Commercialization of Space: Finally, India's space policy recognizes the potential for commercial activities in space, which can also have national security implications. This includes the development of a domestic, commercial space industry, as well as policies and regulations to support commercial space ventures while ensuring national security interests.

India's space policy is centred around four key pillars: national security, socio-economic development, international cooperation, and space diplomacy. The country's space program aims to achieve self-reliance in space technology and promote international cooperation for peaceful uses of outer space. National security is a critical pillar of India's space policy, and the country has developed a

<sup>16</sup> United Nations Office for Outer Space Affairs, 'The Outer Space Treaty' <https://www.unoosa.org/oosa/en/ourwork/spacelaw/treaties/introouterspacetreaty.html> accessed 17 March 2023.

<sup>17</sup> United Nations Office for Outer Space Affairs, 'Treaties and Principles on Outer Space' <https://www.unoosa.org/oosa/en/ourwork/spacelaw/treaties.html> accessed 17 March 2023.

range of military capabilities to protect its space-based assets. However, the policy also recognizes the importance of civilian uses of outer space in driving socio-economic development and promoting international cooperation.

### **Challenges of National Security and Space Diplomacy**

India's space policy was centred on the peaceful use of space and socioeconomic development. However, as India's space capabilities have grown, the country has become more aware of the value of space in national security and military applications. As a result, it is necessary to balance civilian and military uses of outer space in accordance with India's space policy and international obligations. One of the most difficult challenges in this regard is ensuring that national security concerns do not jeopardise India's role as a responsible spacefaring nation. While using space for national security purposes is a legitimate goal, it must be done in accordance with international law and the principles of peaceful uses of outer space. This necessitates a delicate balance of national security and space diplomacy as India seeks to establish and maintain strategic partnerships with other space-faring nations while also protecting its own national security interests. India's space policy emphasizes the use of outer space for scientific research, national security, and socio-economic development. The dual-use nature of many space technologies means that there is a risk of their misuse, posing a threat to national security. The development of space-based surveillance and intelligence capabilities is critical for addressing these challenges<sup>18</sup>.

Space diplomacy plays an increasingly important role in India's efforts to address these challenges. India has been an active participant in international space cooperation, promoting

<sup>18</sup> Gokhale, N. and Sundaram, J.K., 2021. Space-based surveillance and intelligence capabilities: An Indian perspective. *Strategic Analysis*, 45(2), pp.121-139  
<https://www.tandfonline.com/doi/abs/10.1080/09700161.2021.1902247>  
accessed 17 March 2023.

the principles of peaceful uses of outer space and responsible space activities. India has signed several space-related agreements, including the Outer Space Treaty, the Moon Agreement, and the Liability Convention<sup>19</sup>. These agreements provide a framework for international cooperation and collaboration in outer space activities, promoting mutual understanding and trust between nations.

However, space diplomacy also presents its own set of challenges. The space race and increasing militarization of outer space by certain nations have led to concerns over the weaponization of space and the potential for an arms race. The absence of a comprehensive international legal framework for space activities poses challenges for space diplomacy efforts<sup>20</sup>. Overall, the challenges of national security and space diplomacy are critical considerations for India's space policy. The development of space-based surveillance and intelligence capabilities and the promotion of responsible space activities through international cooperation and diplomacy are essential for ensuring national security and peaceful uses of outer space.

### **Greater Military Focus**

Finally, a balance must be struck between national security and socioeconomic development. The use of space for social and economic development is central to India's space policy, and it is critical that national security considerations do not obstruct these goals. This necessitates careful prioritisation of space activities and investments<sup>21</sup>, as well as a multifaceted approach to space policy that considers the needs of various sectors and stakeholders.

<sup>19</sup> Bhonsle, U., 2021. Space policy and national security: India's expanding footprint in the final frontier. *Contemporary Southeast Asia*, 43(1), pp.1-25.  
<https://muse.jhu.edu/article/791804> accessed 17 March 2023.

<sup>20</sup> Manoj, P., 2018. Militarisation of space: Challenges and opportunities. *Journal of Defence Studies*, 12(2), pp.41-61.  
[http://www.idsa.in/jds/12\\_2\\_2018\\_MilitarisationofSpaceChallengesandOpportunities\\_pmanoj](http://www.idsa.in/jds/12_2_2018_MilitarisationofSpaceChallengesandOpportunities_pmanoj) accessed 17 March 2023.

<sup>21</sup> Bhatia, T. (2022, September 1). India's Space Priorities Are Shifting Toward National Security. *Carnegie Endowment for International Peace*.  
<https://carnegieendowment.org/2022/09/01/india-s-space-priorities-are-shifting-toward-national-security-pub-87809>.

These expanding capabilities should significantly improve the Indian military's situational awareness, particularly in border areas. Some of India's first military satellites, such as the RISAT series, were designed specifically for this purpose. Though these systems were initially developed in response to terrorist threats following the 2008 Mumbai attack, they have broader utility for all of the country's military services. India has also launched communication satellites, allowing each branch to better coordinate operations. This is especially important for the Navy, given its extensive operational theatres. Finally, India's investment in its navigation satellite constellation will enable all Indian forces to position themselves in all types of operations without relying on foreign navigational satellites.<sup>22</sup>

Along with capability enhancements, India has implemented institutional changes to improve the way its armed forces use space. The establishment of the Integrated Space Cell in 2010 was a small but significant step towards better coordination between the Department of Space and the Indian Armed Forces, as well as a shared understanding of the emerging threats that India faces. The Defence Space Agency, established in 2018, could be a precursor to a full-fledged aerospace command, which the armed forces have demanded for more than two decades.<sup>23</sup>

### **India's Emerging power in space**

As we progress, India should strengthen its ties with like-minded partners. It should particularly press the Quad to step up its space security and governance efforts. Space security threats have the potential to rapidly reduce usable space orbits, which is a concern shared by all four Quad nations. The lack of agreement in

multilateral space security discussions and arms control debates suggests that the Quad has an opportunity to play an important role in bringing key states' perspectives together. The Quad should eventually include the United Kingdom, Canada, France, and others in order to create a coordinated platform for multilateral negotiations.

India should also collaborate with the Quad on Space Domain Awareness (SDA), which is the ability to monitor the space environment for threats such as natural occurrences and intentional attacks. In this regard, the United States is the most capable state. Nonetheless, increasing space insecurity, particularly among Indo-Pacific states, highlights the need for more comprehensive Southern hemisphere coverage. This would necessitate upgrading space tracking and monitoring capabilities to ensure a continuous flow of information on the threat environment, allowing for timely action and appropriate redressal measures. Outside of the United States, Quad countries have limited SDA capabilities, but combining efforts can provide a more complete picture of the Indo-Pacific and beyond threats. This could involve enhancing the quality of surveillance and the number of platforms available.<sup>24</sup>

Moreover, despite India's reservations, New Delhi should consider joining the US-led Artemis Accords, which are bilateral agreements between Washington and participating countries based on key principles enshrined in the 1967 Outer Space Treaty for safe, secure, and transparent moon exploration. India has not endorsed the accords, possibly because it is not a multilateral agreement created under the auspices of the United Nations. Nonetheless, it provides an important opportunity to review lunar activities as well as develop lunar norms and standards around themes such as

<sup>22</sup> Financial Express, 'Military Satellites: India Needs to Fasttrack' (27 September 2021) <https://www.financialexpress.com/defence/military-satellites-india-needs-to-fasttrack/2376190/> accessed 17 March 2023.

<sup>23</sup> Rajeswari Pillai Rajagopalan, 'India's Space Priorities Are Shifting Toward National Security' (Carnegie Endowment for International Peace, 1 September 2022) <https://carnegieendowment.org/2022/09/01/india-space-priorities-are-shifting-toward-national-security-pub-87809> accessed 17 March 2023.

<sup>24</sup> Keller, Jon R. and Fahey, Joseph, "Shared Situational and Domain Awareness as an Initial Framework for Strengthening the Global Air Transportation System against Cyber Threats" (2017) *Journal of Information Privacy and Security*, 13(3), pp. 133-148. <https://www.airuniversity.af.edu/JIPA/Display/Article/3111121/shared-situational-and-domain-awareness-as-an-initial-framework-for-strengtheni/> accessed 18 March 2023.

information sharing, interoperability, and lunar governance measures. India has no realistic alternative to the Artemis Accords; given the state of India's relations, the International Lunar Research Station being developed by China and Russia is not a viable option for India, considering the state of India's relations with China.

With China's growing perception of space security threats and a desire to strengthen India's space capabilities and influence in global space governance, New Delhi is likely to pursue its ambitious space goals in the coming years. This will lead to India focusing on technology development while also developing and nurturing space security partnerships with other Indo-Pacific countries.<sup>25</sup>

### **Opportunities for Socio-Economic Development**

India's space policy has always emphasized the use of outer space for socio-economic development, in addition to scientific research and national security. Space technology has enormous potential to support various sectors, including agriculture, healthcare, communication, and disaster management. India's space program has already made significant contributions to socio-economic development, and there are several opportunities for further expansion and innovation.

One of the key areas where space technology can support socio-economic development is agriculture. India's space agency, the Indian Space Research Organisation (ISRO), has developed several applications for precision agriculture, including soil moisture mapping, crop yield estimation, and pest prediction.<sup>26</sup> These applications can help farmers to optimize their crop production, reduce wastage, and

increase their income. For instance, the Kisan Suvidha mobile app developed by ISRO provides information on weather forecasts, market prices, and agricultural practices, enabling farmers to make informed decisions.

Another area where space technology can support socio-economic development is healthcare. ISRO has developed several telemedicine applications that enable remote diagnosis and treatment of patients in rural areas. For instance, the Remote Diagnostics Services (RDS) project enables doctors in urban areas to remotely diagnose patients in rural areas using telemedicine equipment.<sup>27</sup> This can help to reduce healthcare costs, improve access to healthcare, and enhance the quality of healthcare services.

Space technology can also support disaster management and emergency response. ISRO has developed several applications for disaster management, including flood mapping, landslide detection, and cyclone tracking. These applications can help to mitigate the impact of natural disasters by enabling timely and effective response. For instance, during the Kerala floods in 2018, ISRO's satellite imagery was used to identify areas affected by floods and to support relief operations.

In addition to these sectors, space technology can also support several other areas, including education, transportation, and energy. For instance, ISRO's satellite-based navigation system, NavIC, can support the development of intelligent transportation systems, enabling safer and more efficient transport. Similarly, space technology can support the development of renewable energy sources, by providing data on solar radiation and wind patterns.<sup>28</sup>

<sup>25</sup> Rajeshwari Pillai Rajagopalan, 'India's Space Priorities Are Shifting Toward National Security' (Carnegie Endowment for International Peace, 1 September 2022) <https://carnegieendowment.org/2022/09/01/india-space-priorities-are-shifting-toward-national-security-pub-87809> accessed 18 March 2023

<sup>26</sup> Indian Space Research Organisation, Kisan Suvidha, <http://kisansuvidha.in/>

<sup>27</sup> Indian Space Research Organisation, Remote Diagnostics Services, <https://www.isro.gov.in/remote-diagnostics-services>

<sup>28</sup> Indian Space Research Organisation, Navigation with Indian Constellation (NavIC), <https://www.isro.gov.in/navigation-with-indian-constellation-navic>



## **Conclusion**

India has demonstrated its strong belief in the vast potential of using outer space for peaceful purposes through a variety of space-based applications and services for national and societal purposes. India has been actively developing various international treaties on space law in United Nations Committees. India has been using space systems for national security purposes, as have most other nations, because such uses are not prohibited by UN treaties on space law. However, India strongly opposes any attempt to place weapons in space or conduct unconventional weapons tests in space, as this would pose a long-term threat to all space systems, whether they are used for civilian or military purposes. India is keeping a close eye on international events. Appropriate steps would be considered/taken at the appropriate time without jeopardising Indian national interests.<sup>29</sup> While national security is an important component of India's space policy, the country also recognises the value of civilian uses of space in driving socioeconomic development and promoting international cooperation. As the country's space activities expand, policymakers must remain vigilant to ensure that they adhere to international standards and do not destabilise the global security environment.

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<sup>29</sup> GlobalSecurity.org, 'India - Military Space Programs', <https://www.globalsecurity.org/space/world/india/military.html> accessed 18 March 2023.