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Policy Brief

India's Space Security Policy: A Proposal

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S*ummary*

Since the inception of its space programme, India has believed in using space technology only for purpose of socio-economic development. However, it is now time that India devised a cohesive national policy to guard its interests in space and effectively address existing and emerging challenges. The purpose here though is not to propose an all-encompassing document addressing various civilian, commercial and strategic challenges in the space domain. The scope of the proposed document is rather restricted to suggesting ways to approach the idea of formulating India's space security policy.

Several advancements made in the field of space technology over the last few decades have significantly benefitted mankind. Today, space technology is considered critical to human survival and progress. Since space offers numerous socio-economic benefits, the number of states investing in satellite technology has grown over the years. *Satellites* are now being used for many purposes: meteorology, television broadcasting, mobile telephony, navigation and internet. Space systems are increasingly being used in multiple fields, such as financial management, education, tele-medicine, scientific research and disaster management, to gather real time information and increase efficiency and connectivity. *Satellite* technology is also playing a *crucial* role in measuring greenhouse gas emissions globally. In fact, space is rapidly emerging as an important component of the global economy.

At the same time, however, the dual use nature of space technology enables its utilisation for security purposes too. In the last few decades, military campaigns have demonstrated the significance of space technology for military purposes. The use of outer space for military support functions like reconnaissance, communication and navigation have received global acceptability since such usage does not directly violate any existing international legal regime.

Owing to growing dependence on space resources, there exists a possibility of intentional tampering with such assets and the associated ground setup, either by state or non-state actors. A space-faring country like India needs to ensure that its interests in respect of orbital slots, radio frequency spectrum, etc., are protected. The rapidly changing global space order could also give rise to newer challenges. Given all this, it is important that India formulates an effective policy to secure its interests in space.

India's Adherence to Space Norms

India's dependence on space technology and satellite derived products has been increasing. As a leading space-faring nation, it has a major future agenda aimed at developing its own space assets for socio-economic as well as strategic purposes. India believes in protecting space sustainability to allow peaceful uses of outer space by all stakeholders. India adheres to various multilateral conventions or guidelines that seek to ensure continuous space access for all, on the one hand, and mitigate potential man-made or natural risks, on the other.

The UN General Assembly (UNGA) had established a Committee on the Peaceful Uses of Outer Space (COPUOS) in 1959, and had proposed five treaties for approval and ratification by the member states. India is committed to the observance of the following UN conventions/guidelines that have broader global acceptability:

India adheres to the 1967 Outer Space Treaty (OST), 1968 Rescue Agreement, 1972 Liability Convention and 1974 Registration Convention. Also, India is a signatory to the 1979 Moon Agreement.

1. The COPUOS has addressed various issues over the years leading to various declarations by the General Assembly with which India is in agreement. These include:
 - 1963 Declaration of Legal Principles Governing the Activities of States in the Exploration and Use of Outer Space
 - 1982 Principles Governing the Use by States of Artificial Earth Satellites for International Direct Television Broadcasting
 - 1986 Principles Relating to Remote Sensing of Earth from Outer Space
 - 1992 Principles Relevant to the Use of Nuclear Power Sources in Outer Space
 - 1996 Declaration on International Cooperation in the Exploration and Use of Outer Space for the Benefit and in the Interest of All States, Taking into Particular Account the Needs of Developing Countries.
2. India is a member of the Inter-Agency Space Debris Coordination Committee (IADC) and adheres to the Debris Mitigation Guidelines of 2008.
3. India actively participates in all discussions at the Conference on Disarmament (CD). India was the co-sponsor of the UNGA resolution 68/29 on Prevention of an Arms Race in Outer Space (*PAROS*). India had also joined the G21 working paper in CD 1941 submitted to the Conference in 2013.
4. Though India was not the part of the Group of Governmental Experts (GGE, 2011-13) committee, it agreed to the use of Transparency and Confidence Building Mechanisms (TCBMs) to ensure space security. Also, India is constructively debating the European Union (EU)-sponsored proposal for creating an International Code of Conduct (ICoC) as an interim measure until a legally binding space treaty mechanism is formulated.
5. India is prepared (in principle) for deliberations on the revised Treaty on Prevention of the Placement of Weapons in Outer *Space* and of the Threat or Use of Force Against Outer *Space* Objects (PPWT) presented by Russia and China, as a contribution to the various proposals for negotiating a legally binding instrument in the CD.

Requisites

Capabilities in space have the potential to influence the international balance of power. For India, it is important to focus on space applications of strategic

significance and also use diplomatic means to ensure that space remains a medium for conducting peaceful activities in support of mankind.

It is argued that space is becoming an increasingly 'congested, contested, and competitive' medium. Space is a strategic resource for civilian (societal), commercial and military uses. Over the years, it has been observed that many states are exploiting space technologies for peaceful purposes. Also, in some cases, space technologies are being used for enhancing military capabilities in the field of surveillance, navigation and communication, which do not directly interfere, damage, degrade or destroy and hence are not considered as offensive capabilities. However, policies of some states do show signs of gradual militarisation and weaponisation of outer space and their actions appear to be exploiting the ambiguities in the existing space law regime.

Space as a medium is useful for hosting artificial platforms like satellites and space stations. This medium is also important for the passage of ballistic missiles and for operating various military systems like missile defence system, spy planes (orbital UAVs), near-space systems, and anti-satellite weapons like Kinetic Kill Weapons, etc. The satellite operations could be hindered by using either ground or space based jammers or even by cyber means. It has been observed that space debris and intentionally created hindrances like space mines, pre-programmed micro satellites and inclement space weather could have adverse impacts on various space-based operations. There also exists a possibility of deployment of space-based weapons, laser-directed energy weapons, etc., either for targets in space or on the ground. From the geostrategic prism, space is increasingly being viewed as a foreign policy tool and a force multiplier, and simultaneously also as the fourth medium of warfare.

Since the inception of its space programme, India has believed in using space technology only for purpose of socio-economic development. However, it is now time India devised a cohesive national policy to guard its interests in space and effectively address existing and emerging challenges. The purpose here though is not to propose an all-encompassing document addressing various civilian, commercial and strategic challenges in the space domain. The scope of the proposed document is rather restricted to suggesting ways to approach the idea of formulating India's space security policy.

Policy Viewpoint

Aspect 1: Develop an institutional structure to implement space security policy

As the Indian space programme is civilian in nature, the existing institutional structure is meant to cater mainly for civilian requirements. Presently, the Space Commission is responsible for the growth, development, sustenance and furtherance of the space programme. To cater for strategic requirements, a National Authority for

Space Security (NASS) needs to be established under the defence ministry to oversee all aspects of space security.

Under NASS, a Space Security Centre (secretariat to the Authority) could be established for coordinating the activities of the various stakeholders and to liaise with various agencies of the Space Commission. The proposed centre could also suggest modifications in the exiting policy architecture as found necessary from time to time.

The aforesaid Space Security Centre would, however, be required to invest in building a pool of qualified personnel, space scientists, strategic technologists, technology managers, lawyers and diplomats.

Aspect 2: Establish a Space Command

It is important to appreciate that all present and future military operations, and various military training activities and exercises undertaken during peacetime, would be heavily dependent on satellite technology. The Army, Navy, Air Force and other services like the Coast Guard and the Border Security Force are likely to increase their reliance on satellites for purpose of intelligence gathering, communication, navigation and operating various weapon systems.

There is also a need to develop Intelligence-Surveillance-Reconnaissance (ISR) capacities in space to support network centric strategies. A dedicated Space Command needs to be established for administering various military-related aspects of satellite technology. This command would directly liaise with NASS for all policy matters and budget requirements.

Aspect 3: Enhance Space Situational Awareness Capabilities

It is important for India to protect its critical space assets and infrastructure from possible tampering. For launching of satellites and ensuring that operational satellites do not suffer damage from space debris, it is important to get timely warnings. For this purpose, there is a need to develop a combination of an IR-microwave-radar network for gathering technical intelligence in space. As of now, no country is in a position to establish and maintain such a network on its own.

The issue of space situational awareness is directly connected with the issue of global space governance. It is important for India's foreign policy establishment to ensure that the country has stakes in any global programme on space situational awareness. In fact, India could take the initiative to develop such a global programme. Alongside, there is also a need to put in place a Space Collision Warning System.

With increased activity in the space domain, satellites are being positioned in various layers of outer space, from near space to geostationary orbit to ionosphere to deep space regions for planetary missions. For effectively utilising such assets to their full potential, it has become essential to study, monitor and forecast space weather continuously. Also, it is important to monitor the movements of asteroids, comets,

etc. For this purpose, a separate space weather monitoring and forecasting capability needs to be developed by engaging the Indian Meteorological Department (IMD) and the proposed Space Command.

Aspect 4: Legal Architecture

Alongside the scientific community, diplomats and space lawyers too have a key role in developing a space security agenda. The stakes for private industry in the space arena are rapidly growing. Further, there is a need to update existing national laws and consider legislating new space laws. The development of such a legal regime should also cater to the need for international space treaty obligations. Presently, the Indian Space Research Organisation (ISRO) is in the process of developing a Space Act. This act should form the basis for the development of future legal frameworks and structures. There is also a need to evolve guidelines to respond to any hostile activity in outer space.

Aspect 5: Strategic Technologies

There is a need to identify and develop various critical strategic technologies. Technological innovation needs to be encouraged and agencies like the Defence Research and Development Organisation (DRDO) should be actively engaged in this regard. Also, private industry should be encouraged to undertake various technology development and production projects. ISRO has already started transferring launch vehicle technology to the private industry. Technologies available in the realm of communications, small satellites, sensors, etc. are to be shared with the DRDO/private industry to create an ecosystem for space technologies of strategic importance.

India is against the weaponisation of space, but it needs to remain prepared for any eventuality at the same time. Emphasis should therefore be given to the development of satellite hardening and anti-jamming technologies as well as for building launch on demand capabilities. It is essential to identify broad sectors of technologies of importance in the counter-space arena, while building an indigenous technology base to meet future challenges. Both satellites in space and ground infrastructure could become vulnerable to cyber attacks. Hence, a specific cyber security mechanism also needs to be put in place.

Aspect 6: Counter-space Capabilities

India's increasing military dependence on space would also make space assets more vulnerable to attacks by adversaries. Hence, redundancy mechanism needs to be ensured. Adversaries should be aware of India's retaliatory capabilities. For this purpose, India would have to develop effective counter-space capabilities. India needs to undertake a debris-less Anti-satellite Weapons (ASAT) test as a deterrence demonstration. This demands initiating a Kinetic Energy Anti-Satellite (KE-ASAT) programme and conducting a demonstrative test at an altitudes of less than 250 km.

Also, there is a need to develop methods for satellite jamming at various orbits. However, at the same time, India should voluntarily commit to a No First Use (NFU) policy with regard to any offensive action in space.

Implementation

This space security policy document presents an approach to address the existing and emerging space security challenges. India so far has continued with its original space agenda of using space technology specifically for the purpose of socio-economic development. The need for the proposed document however arises in the context of the rapidly changing global space security dynamics.

ISRO has been pivotal to developing the space programme for all these years and today it even competes with the best in the world. Consequently, ISRO would remain central to the formulation and implementation of India's space security policy. In fact, there would be both horizontal and vertical level interactions between the various departments of ISRO and the agencies that have been proposed here for devising the country's national space security architecture.



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