The Challenges And Opportunities For India In The Field Of Space Laws

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ABSTRACT

"*Space: The Final Frontier...*" In this famous quote of Captain Kirk from the Star Trek Series (1966-1969) one can see reflections of what the future of space would look like. Since the launch of Sputnik 1 by the USSR in 1957, space capabilities have advanced significantly. The first rocket launch in India occurred in 1963, and ISRO has since developed into one of the world's most advanced space agencies. With the advancement in space technology, the law that regulates space and activities carried out in outer space and other celestial bodies must also be developed. Several treaties, such as the Outer Space Treaty (1967), Liability Convention (1972), and more, have been drafted. Despite ratification, India has yet to adopt a thorough space strategy that addresses every facet of these treaties. Numerous problems have surfaced as a result of the space industry's expansion and development. Though India has some rules in place like the Satellite Communication Policy and now the newly introduced Indian Space Policy, there is still a dearth of active legislation that deals with emerging issues in this sector. In this context, this paper aims to make a case for the development of domestic space legislation. This is done by analyzing existing space regulations in the country while also studying cases of the UK and the USA in space legislation. Finally, this paper draws on conclusions and lessons that India can incorporate while formulating its own space law.

Keywords: Space Law, Indian Space Law, Indian Space Policy 2023, International Space Law

INTRODUCTION

In 1957, the USSR launched Sputnik 1, the first satellite ever. It signaled the start of the "Space Race" and later served as the primary impetus behind the creation of international space regulations. Sputnik 1's successful launch validated space travel, which had previously just been a pipe dream for those on Earth. In this period, both the USSR and the US were making every effort to lead the way in space exploration, and the competition between the two countries, which each sought to surpass the other, produced wonders in the field. In order to ensure that future developments in space would only be used for peaceful and scientific purposes, the US approached the UN in the years 1957–1958[1]. As a result, in 1957, the General Assembly of the UN adopted Resolution 1148 (XII), which was the first UN resolution on space. The main focus of the Resolution was on disarmament since at this time, the

[1] Carl Q. Christol, The Modern International Law of Outer Space (Pergamon Press, New York, 1982)

UN had to safeguard global peace. The UN used the words "exclusively for peaceful purposes" in this resolution for the first time.[2]

India has always been at the forefront of space policies and law, especially the Outer Space Treaty. India was one of the main proponents of UNGA Res. 1472 (XIV), which established the UN Committee on the Peaceful Uses of Outer Space (UNCOPUOS).
On December 11, 1961, a resolution for "International cooperation in the peaceful uses of space" was supported by India and its allies.[3] Notably, the Non-Aligned Movement (NAM) was already in existence. India was a founding member, and Jawaharlal Nehru, its prime minister, was a strong proponent of the unification of newly independent nations in a bipolar world. As a result, India was able to negotiate the International Space Law without being influenced by the US or the USSR.
Internationally as well, there have been many concerted efforts to bring about a policy regime aimed at regulating space ventures, especially considering the onboarding of private players in this sector. This, coupled with the growing militarisation of space as well as future resource mining activities, makes it necessary for countries to have domestic legislations in consonance with the international law.

INTERNATIONAL TREATIES ON SPACE LAW

After the first venture into space by the then USSR and consequently the first step taken by man on Moon, what became pertinent was having certain laws or regulations in place. The UN created a number of agreements, treaties, resolutions, declarations, etc. that further evolved into international space law in response to the rising tensions between the US and the USSR about technological and scientific advancement in outer space.
The International Law on Outer Space has been condensed into five instruments by the UN through the General Assembly Committed on the Peaceful Uses of Outer Space (COPUOS).
These five agreements include:

1. **Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies, 1967**

This treaty, also known as the **Outer Space Treaty,** is the torchbearer of space legislation. According to the Outer Space Treaty of 1967, all "exploration or use of outer space" must be done for the benefit of all countries on the globe, "regardless of their level of economic or scientific development." In

[2] Johannes M. Wolff, "'Peaceful uses' of outer space has permitted its militarization – does it also mean its weaponization?", 2003
[3] https://caslnujs.in/2022/07/31/outer-space-treaty-and-indias-space-policy-forging-a-path%EF%BF%BC/

accordance with the Treaty, no country is permitted to claim ownership of the Moon, space, or any other celestial body. Additionally, according to Article IV of the Treaty, States Parties must assure cooperation and cannot use or authorize the use of weapons of mass devastation in orbit or elsewhere[4]. The Treaty imposes liability on the States for any kind of damage to another State Party.

2. **Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Objects Launched into Outer Space, 1968**

The **Rescue Agreement** came into force in 1968 after a round of UN negotiations from 1962-1967. According to the Rescue Agreement, any state party that learns that a spacecraft's crew is in trouble shall immediately inform the launch authority and the UN Secretary General. In essence, it states that any state that is a participant to the agreement must offer all aid necessary to rescue the crew of a spacecraft that has landed on its soil, whether as a result of an accident, distress signal, emergency, or inadvertent landing.[5] Any state party that is in a position to do so shall, if necessary, give aid in the search and rescue effort if the distress arises outside the borders of any nation.[6]

3. **Convention on International Liability for Damage Caused by Space Objects, 1972**

In September 1972, the **Liability Convention** went into effect. It expands on article 7 of the Outer Space Treaty of 1967 and states that the "launching State" shall be responsible for paying compensation for any damages caused by its "space objects on the surface of Earth or to aircraft" and liable for any damages resulting from such State's errors in outer space[7]. According to the Liability Convention, the State has the burden of liability, not any one person.

Therefore, it is crucial for each signatory State to have strong space laws to ensure that the interests and benefits of that State are protected when entering into any type of contract regarding space-related concerns with another State. However, the absence of such a State's national space laws does not exclude it from the liability protections provided by this convention. India stands at a disadvantage compared to other nations since it has no laws governing space-related operations.

4. **Agreement Governing the Activities of States on the Moon and Other Celestial Bodies, 1979**

The **Moon Agreement** was adopted by the UNGA in 1979. Many of the provisions of the Outer Space Treaty that apply to the Moon and other celestial bodies are reiterated and expanded upon in the

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[4] The Outer Space Treaty, 1967, art. IV – "States Parties to the Treaty undertake not to place in orbit around the Earth any objects carrying nuclear weapons or any other kinds of weapons of mass destruction, install such weapons on celestial bodies, or station such weapons in outer space in any other manner".

[5] https://www.unoosa.org/oosa/en/ourwork/spacelaw/treaties/rescueagreement.html

[6] https://en.wikipedia.org/wiki/Rescue_Agreement

[7] Convention on the International Liability for damage caused by space objects, United Nations Office for Outer Space Affairs

Agreement, including the requirements that they only be used for peaceful purposes, that their environments not be disturbed, and that the United Nations be informed of the location and purpose of any station established on those bodies.[8] India has signed but not ratified the Moon Agreement. One major reason behind this is the fact that major players like the UD, Russia and China have not signed the agreement altogether. In accordance with Article 4.1 of the agreement, "the exploration and utilisation of the Moon should be the province of all mankind and shall be pursued for the benefit and in the interests of all countries, irrespective of their level of technological advancement. Since China is actively pursuing the Moon, with India undertaking its own ambitious programmes, it is highly advisable that rather than being a signatory to this treaty, India undertakes "pragmatic collaborations".

5. **Convention on Registration of Objects Launched into Outer Space, 1974**

The **Registration Convention** was adopted by the UNGA in 1974. The Secretary-General of the United Nations is required to keep a register in which the information provided under article IV shall be recorded, according to Article III of the Registration Convention[9]. Additionally, it states that all information about the signatory States shall be "full and open access" in the Register. The Convention elaborates Article VIII of the Outer Space Treaty, which posits the idea of space object registration and its primary implication, the ability to exercise jurisdiction over the space objects so registered.[10]
It is important to note that India is signatory to all of these five conventions but has ratified only four.[11]

INDIA and SPACE

India's journey to space began with the launch of Aryabhatta satellite in 1975 by the Indian Space Research Organisation (ISRO). Since then, the Indian Space Program has grown leaps and bounds under ISRO. The latest success of Chandrayaan-2 Mission is a testament to India's growing prowess in space related activities.
The Indian space programme has been well-managed since its start. Satellites for communication and remote sensing, the space transportation system, and application programmes make up its three main components. The Indian National Satellite (INSAT) for communications, television broadcasting, and meteorological services and the Indian Remote Sensing Satellite (IRS) for controlling and monitoring natural resources as well as disaster management support are the two main operational systems that have been built. However, at present, India lacks any space related legislation. Space-related operations are governed by a small number of laws and regulations, including the National Remote Sensing

[8] https://www.unoosa.org/oosa/en/ourwork/spacelaw/treaties/intromoon-agreement.html
[9] Convention on Registration of Objects launched into outer space, United Nations Office for Outer Space Affairs Adopted by General Assembly of the United Nations, at New York in November 1974.
[10] https://core.ac.uk/reader/17241690
[11] http://doi.one/10.1732/IJLMH.25910

Centre (NRSC) Guidelines of 2011 and the Indian Space Research Organisation (ISRO) Act of 1969. But laws and standards are essential to rein in India's burgeoning space industry. India is beginning to acquire traction as a potential participant in the international commercial space industry. There are many issues that need to be addressed, including licensing, data processing and distribution linked to earth observation services, certification of space technology, insurance, legal issues with launch services, contract negotiation, dispute resolution, and stamp duty.[12] To include space law-related issues in domestic law, the required statute and laws must be revised.

ROLE OF PRIVATE SECTOR

The Indian government declared the creation of two new organizations to promote the active involvement of participants from the business sector in the Indian space industry. New Space India Limited (NSIL), a public business that was established in 2019 as the commercial arm of ISRO and is managed by the DOS, was established. The NSIL was founded with the purpose of turning space activities from a supply-driven model to a demand-driven model by commercially utilizing the results of ISRO's research and development. The NSIL is required to own and run satellites, create launch vehicles, offer launch services, and permit technology transfer.

The Indian National Space Promotion and Authorisation Centre (IN-SPACe) was announced to be created by the government in June 2020. With a goal to support, promote, and direct the private space industry in India, this organization acts as a regulator and facilitator for the sector. For IN-SPACe to function as a regulator under Article VI of the Outer Space Treaty, a licensing, authorisation, and supervision regime was established. As it evaluates the demands of this sector in collaboration with ISRO, it also serves as a facilitator for the private sector.

The Indian National Space Promotion and Authorisation Centre[13], or IN-SPACe, was established by the Indian government on June 24, 2020. IN-SPACe was created as a "single window nodal agency" to promote the commercialization of Indian space activities. The agency serves as an addition to the ISRO and is responsible for encouraging Non-Governmental Private Entities (NGPEs) to enter the Indian space industry. Through encouraging policies in a welcoming regulatory environment and by sharing the already existing necessary facilities, the agency will encourage a quicker induction of the private participants in the sector. India's space industry will be greatly boosted by the arrival of the private sector, which "is expected to result in development of cutting edge technologies, new applications & services.[14]" Additionally, it will stop Indian scientists and engineers from emigrating to

[12] https://www.cyberpeace.org/resources/blogs/space-laws-indian-perspective

[13] https://indianexpress.com/article/india/cabinet-gives-nod-to-private-participation-in-space-sector-6474881/

[14] https://www.pib.gov.in/PressReleasePage.aspx?PRID=1696776

the United States to work in the space industry. Twenty six businesses and startups have already contacted[15] ISRO for facility sharing and technical assistance with space-related activities.
Another addition is the Antrix Corporation Limited[16]. It is a government-owned corporation with headquarters in India that reports to the Department of Space. It was established in September 1992 as the commercial and marketing branch of ISRO and is responsible for developing, commercially delivering, and marketing ISRO-originating goods and services.[17] It is the ISRO's commercial and marketing division, and it sells and advertises products and services related to space. It comprises the delivery of hardware and software, ranging from basic components to a complex spacecraft, and covers a wide range of applications, including communications, earth observation, and research missions.

CURRENT SPACE LAWS in INDIA

It would be surprising to learn that India still lacks adequate space legislation in light of the massive achievements in the space sector and the emergence of the private sector. International Law is applicable in the absence of any domestic legislation. **Articles 51, 73 and 253 of the Constitution of India, 1950**, support the duties of the **Vienna Convention of the law of Treaties, 1968**, which lessens the ambiguity of India's space industry. India is a party to numerous space law treaties, resolutions, and other agreements. For instance, Article VI of the 1967 Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space[18], including the Moon and Other Celestial Bodies, holds nations accountable for all activities in space, whether they were conducted by their space agency or by a private party. In other words, all space-related operations are national in nature. Any space-related actions taken by a private entity are governed by the laws of the state in which it is registered. Thus, any accident caused by a private participant would subject the Government of India to liability.
India has managed fairly well without a national space legislation for a nation that has built up a formidable space exploration programme over the previous 50 years. The realities of more than 50 years ago, when "national development" was the main goal, are reflected in current policy. As a result, there are extensive rules for satellite communication and remote sensing, but few for strategic and commercial goals. Some rules and norms have been formulated in line with India's space policies. These are:

[15] https://www.pib.gov.in/PressReleasePage.aspx?PRID=1696777
[16] http://www.antrix.co.in/
[17] https://en.wikipedia.org/wiki/Antrix_Corporation
[18] https://www.unoosa.org/oosa/en/ourwork/spacelaw/treaties/introouterspacetreaty.html

1. **SATELLITE COMMUNICATION POLICY, 1997:**

The SATCOM Policy was developed in 1997 by the Department of Space, the Department of Telecommunication, and the Department of Science and Technology. The policy placed a focus on creating "launch capabilities" and "satellite communication," as well as on building out the infrastructure, encouraging "private investment in the space sector" and enabling the use of "foreign satellites for services in India."[19] The SATCOM Policy has four major objectives: "developing satellite communication, launch vehicles and ground equipment industry in India; making available and developing further the infrastructure built through the government operated Indian National Satellite System (INSAT); encouraging private sector investment in space industry; and allowing use of foreign satellite services in India to a limited extent."[20]

However, the government realized the inefficiency of the SATCOM Policy, 1997, to cater to the ever-growing Indian space industry and therefore, introduced NORMS in 2000 for its smooth implementation. These regulations outlined the policy's parameters and placed special emphasis on the usage, expansion, and treatment of the INSAT network and of Indian satellites. To authorize the use of Indian satellites by commercial actors based on the "capacity and capability" of the transponders and the INSAT network, numerous subcommittees were established. However, with the influx of more private players and current developments, it is necessary to reconsider the SATCOM Policy and make the appropriate adjustments such that the combined potential of public and private players is maximized.

2. **REMOTE DATA SENSING POLICY, 2011:**

The RSDP Policy was first framed in 2001, but got further amended in 2011.[21] Under the Policy, the National Remote Sensing Centre (NRSC) has been given the ability to collect and make available for development purposes all satellite remote sensing data collected by Indian and international satellites. Additionally, the government reserves the authority to impose restrictions on imaging duties and the dissemination of data from Indian remote sensing satellites where it is felt that doing so is necessary for the government's foreign policies, national security, and/or international responsibilities.[22] Also, the collection and transmission of satellite remote sensing data by non-government users, whether from an Indian or a foreign satellite, is governed by the RSDP.[23] The Antrix Corporation has the competence to give licenses for the purchase or distribution of Indian remote sensing data outside of India and the right to charge

[19] https://www.iflr.com/article/2a63kwq2xs3rf3y220tmo/india-satellites-investment-policy

[20] https://www.lakshmisri.com/insights/articles/satellite-communications-policy-in-india-time-to-revisit-revise/#

[21] "India's Space Policy", Department of Space, ISRO, Government of India.

[22] https://rsrr.in/2021/03/01/space-policy-isro-in-space-privatisation/

[23] http://www.nishithdesai.com/SectionArticleList/32/Areas-of-Service/5494/SpaceExplorationandTechnology.html

fees for doing so. The "remote sensing sector" has been opened with the goal of lowering barriers to high-resolution data availability for developmental operations. The Remote Data Sensing Policy thus also allows for personal satellites for remote sensing.

3. TECHNOLOGY TRANSFER POLICY of ISRO:

Technology transfer (TT) is the means by which ISRO makes its technical expertise in the technology developed by its centres and elsewhere using ISRO resources available to external organizations. The Department of Space Industry's technology transfer system and the cost of technology development for DOS and ISRO are both determined by the Technology Transfer Policy of ISRO. Technology transfer cases fall under the following categories[24]:

I. TT with the intent of buy-back
II. TT with the intent of space systems utilization and space application
III. TT with the intent of non-space applications i.e., spin-offs

In March 2019, ISRO established a public sector corporation called “New Space India Limited (NSIL)” to aid the transfer of technologies to the public and commercial sectors for economic and national growth. ISRO occasionally posts such technology transfer- related information on its website and in other trade magazines to solicit applications from the businesses in order to raise awareness.

4. THE SPACE ACTIVITIES BILL, 2017:

The need for a more thorough and systematic space law has grown in response to the expanding significance of space operations around the world and the several space treaties India has ratified. In order to clarify the ambiguities and gaps in the laws governing space activities and to give India's private sector access to the growing space market, the Space Activities Bill 2017 was drafted. The law was delivered to the prime minister on August 20, 2020, after considerable review, however, it has not yet received approval. The International Law Association's (ILA) Model Law on National Space Legislation[25] for the Committee on the Peaceful Uses of Outer Space (COPUOS) and other national legislation served as the foundation for the Bill. National space legislation is required, according to the Bill's explanatory note, to "support the overall growth of space activities in India." However, the Bill is still pending and is yet to be turned into legislation. One major drawback with the Bill was that it was harsh in its punishment. If any activity is carried out without prior licensing, if false information is provided, or if it pollutes the earth, air, space, or celestial bodies, the 2017 Bill

[24] https://www.isro.gov.in/media_isro/pdf/ResourcesPdf/technology_transfer_august_2022.pdf
[25] https://www.unoosa.org/pdf/limited/c2/AC105_C2_2013_CRP06E.pdf

provides for up to three years in prison and a fine of over Rs 1 crore.[26] This discourages active participation from private players as the industry is still booming and requires a generous amount of private investment in the absence of government funding. Additionally, while the Bill was in line with international law, it still gave ample space to red tapism and regulatory hurdles, creating an impediment for commercial space investment. The Draft Bill, while legislating for holding the private sector accountable, lacks any elaborate provision for the accountability of the State. It is important for the government to ensure smooth processes for the space industry without unnecessary red tape, time delay, or corruption and middlemen.

5. INDIAN SPACE POLICY, 2023:

The Indian Space Policy 2023, recently approved by the Cabinet Committee on Security, was published on April 20, 2023 by the Indian Space Research Organisation (ISRO) and the Indian National Space Promotion & Authorisation Centre (IN-SPACe)[27]. This will allow India to pursue a comprehensive strategy and promote private sector participation throughout the entire value chain of the space economy. Its vision states that the aim of the policy is "to augment space capabilities; enable, encourage and develop a flourishing commercial presence in space; use space as a driver of technology development and derived benefits in allied areas; pursue international relations, and create an ecosystem for effective implementation of space applications among all stakeholders; for, the nation's socio-economic development and security, protection of environment and lives, pursuing peaceful exploration of outer space, stimulation of public awareness and scientific quest."[28]

The strategy calls for fostering the space industry's R&D, offering space technology-based public goods and services for national priorities, establishing a stable and predictable regulatory framework through IN-SPACe, encouraging space-related education and innovation, and raising public awareness of space activities. Space technology or services can be directly purchased by Indians from any source, whether public or private. The key organizations, including the ISRO, NSIL, IN-SPACe, the Department of Space (DoS), and Non-Governmental Entities (NGEs), are defined and their roles are outlined in this policy.

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[26]https://indianexpress.com/article/india/lenient-bill-insurance-for-space-activities-needed-for-space-sector-growth-ispa-d-g-8201365/

[27]https://www.legal500.com/developments/press-releases/moving-to-next-orbit-indias-new-space-policy-sets-course-for-the-future/

[28] Vision, IndianSpacePolicy2023.

However, the existing policy is unclear regarding the acceptable foreign direct investment (FDI) for the various types of space activities that the NGEs may engage in. Presently, only the establishment and operation of satellites are permitted to receive 100% FDI through the government channel in the space sector. The Policy lacks clarification on areas which are beyond the purview of NGEs as it advocates for accommodation of the private sector in the Indian space industry. To support new space start-ups, the policy framework envisioned will need clear norms and regulations regarding FDI and licensing, government procurement, liability in case of violations, and an appellate structure for dispute resolution. Furthermore, the Policy does not identify the organization in charge of publishing it, such as the Space Commission, DoS, or ISRO, which calls into question its legal standing. Additionally, there is a lack of clarity regarding IN-SPACe's statutory jurisdiction and its ability to create regulatory recommendations for the NGEs[29]. Without regulatory frameworks for NGEs, backed by statutory jurisdiction, tensions might arise between the government and private entities. The policy is also silent on the strategic use of outer space, which is an important component since the Indian defence establishment has begun exploring it for security purposes.[30]

It is possible that the Policy will serve as India's first move towards creating a celestial future in the years to come, and that the government would provide greater clarity in the upcoming space activities bill and other documents. A new chapter in India's space programme has officially begun with the implementation of the Policy.

CASE STUDIES:

To gain a more nuanced understanding of how countries can formulate their own space laws that are in line with international law, we will be looking at case studies of the UK and USA as these countries have been successful in introducing domestic space laws that cover wide areas and cater to the private sector as well.

UNITED STATES of AMERICA:

The United States was one of the first nations to begin developing a space legal framework and has been setting the standard for the rest of the globe. The public space law and administrative procedures pertaining to space exercises are the strongest and most clear of any nation in the United States.[31] The

[29]https://www.legal500.com/developments/press-releases/moving-to-next-orbit-indias-new-space-policy-sets-course-for-the-future/

[30]https://www.deccanherald.com/india/new-space-policy-private-companies-can-approach-the-itu-for-orbital-slots-distribute-remote-sensing-data-space-policy-1212061.html

[31] https://blog.ipleaders.in/space-laws-us-uk-india/

United States values commercial space launch capability for a variety of reasons. This significance is reflected in the 2010 National Space Policy[32], which includes 'energizing competitive domestic enterprises to compete in international markets and advance the development of space launch' as one of its six objectives. The 2013 National Space Transportation Policy[33] established five objectives, including encouraging and facilitating the US commercial space transportation industry to increase industry robustness and cost-effectiveness; and promoting and maintaining a dynamic, healthy, and efficient domestic space transportation industrial base. The Commercial Space Launch Competitiveness Act (the Act)[34] was adopted by the US in 2015. The Act also includes provisions relating to mining operations on celestial planets, such as the Moon and space rocks. According to this Act, the President would "encourage commercial investigation for and commercial recuperation of space assets by US residents" through government offices. According to the Act, US citizens are categorically allowed to "take part in a commercial investigation for and commercial recovery of space assets, as per the worldwide commitments of the US and subject to approval and proceeding with management by the Federal Government."

Owing to its long history of space study and its achievements in space exploration, the USA has one of the broadest legal systems for space in the entire world. The US has also made significant strides in this area with the successful commercialization of space travel. The nation attempted to privatize land remote sensing in previous years, but it did not succeed as well. However, it has served as an example for other nations to follow in terms of formulating and rejuvenating their own legal systems in consonance with changing times.

UNITED KINGDOM:

Another nation that has excelled in space is the United Kingdom, which also has a strong legal framework in this area. Although the nation's space activities have not been carried out as successfully as those of other nations, its legal regulations have performed effectively and are well-framed. The United Kingdom Space Agency (UKSA)[35], which was recently founded in 2010, is the organisation in charge of space affairs in the UK. The Act that governs space related activities in the UK is the Outer Space Act of 1986[36]. The 1986 Act is the mechanism by which the United Kingdom regulates the use of space and the activities carried out there by organizations or individuals from its territory. The principles and requirements outlined in United States space agreements, comparable to the Outer Space Deal of 1967, afterwards serve as the impetus for this action. The Outer Space Act[37] is extremely

[32] https://history.nasa.gov/national_space_policy_6-28-10.pdf
[33] https://www.space.commerce.gov/policy/national-space-transportation-policy/
[34] https://www.congress.gov/114/plaws/publ90/PLAW-114publ90.pdf
[35] https://www.gov.uk/government/organisations/uk-space-agency
[36] https://www.legislation.gov.uk/ukpga/1986/38/contents
[37] https://www.legislation.gov.uk/ukpga/1986/38/contents

important to the United Kingdom because it enables the country to conduct its business in accordance with the rules established by international law. Additionally, it strengthens the safety net surrounding everyone's wellbeing and deftly sidesteps the problem of the UK government's liability for injury.
The Space Industry Act of 2018[38] establishes rules for suborbital and space activities, as well as related goals. It clarifies, among other things, that all offences that would be offences whenever presented in the ward (the UK) are also offences whenever submitted on any space made in this nation. This is comparable to the rules that are in place for boats and aeroplanes. The Act is necessary for the Public Authority's Mechanical System[39], which entails expanding the UK's modest satellite manufacturing sector into a global hub for satellite operations and innovation with access to space. They promise that it will create a large number of profoundly talented roles and result in billions of economic limits.

LESSONS for INDIA

India's interests and strategic objectives for space exploration and usage will be better protected by a formalized space law. Future conflicts will centre on the militarization of space, safeguarding orbital assets, managing space debris, and managing spectrum allocation as more nations develop their space-faring capabilities. A global framework similar to the Nuclear Non-Proliferation Treaty (NPT) might be needed in such an instance. Such a scenario, for instance, might result from unchecked ASAT capability development by numerous companies. India may avoid being forced to sit outside of such a global framework, as it was forced to do on the matter of nonproliferation, by making its position known now and making the broad strokes of its goals public through a well-articulated space legislation.

ISRO has stated recently that it wishes to focus on research and development (R&D), leaving manufacturing to private businesses. The interest that private firms have in the industry is evidenced by recent arrivals like Dhruva Space in the civilian space market.[40] India's space activities could be significantly increased with the passage of a space law containing restrictions on the volume of investment and corporate cooperation. This could also be achieved by offering **tax incentives**, making this sector more lucrative for new and budding investors. The government's main "Make In India" initiative is likely to gain support if the recent opening up of the defence industry to private enterprises is any indication. However, from a more optimistic and proactive standpoint, it would be preferable to make sure that private efforts and funds could be channeled for the greater public cause of India's

[38] https://www.unoosa.org/documents/pdf/copuos/lsc/2018/tech-01.pdf
[39] http://rtiodisha.gov.in/pa/T1RILzIwLzYyODIvMjA=
[40] https://jsis.washington.edu/news/addressing-indias-strategic-needs-national-space-law/

people and economy; if correctly managed by a regulatory framework, this would be a mutually beneficial arrangement.

Outlining the space program's key strategic goals in the law will draw in new talent and collaborations. ISRO has struggled to regularly entice the finest and brightest towards a career in space despite partnering with universities. This is mostly due to the lack of alternative funding for R&D and the fact that the sector exclusively provides jobs within state-run agencies. A complete framework that permits private players could increase research funding and make for a successful career path. Once enacted, a comprehensive law outlining the objectives of space research, development, and exploration as well as envisioning a role for younger businesses will provide the industry with a transformative chance to make the most of the available expertise and use it to usher in a new era in Indian space research.

RECOMMENDATIONS:

While devising a domestic space law, it is pertinent that the specific demands of the Indian space sector are kept in mind while formulating a legislation. In this context, certain challenges might also arise which may need special attention and provisions in any future National Space Act. Some recommendations in that direction are:

A. **Insurance:** The democratization of space has allowed private entities to partake in space activities. However, space-faring technologies are expensive and in turn, the insurance for space activities is also highly expensive. Currently, there is no extensive insurance policy for NGEs in the space sector. If launch vehicles and satellites are insured by private corporations, their costs will rise considerably, making them economically unviable. The Director-General of Indian Space Association, Lt. Gen. AK Bhatt, has made some recommendations regarding the insurance policy in a future domestic space law. In addition to reducing the severity of criminal penalties, the Bill will establish systems for insurance damage claims. On the basis of recommendations made by Lt. Gen. AK Bhatt, it is suggested that the new space policy include setting up a corpus fund that can cover the damages. "They (the government) must devise a cut-off. Companies will pay insurance premiums, for example, up to Rs 300 crore; after that, it becomes a governmental obligation", he said.

B. **Liability:** The liability for damage caused to third parties or to space assets are guided as per established UN Liability Conventions, 1972. Since India lacks a national space law, any liabilites, whether private or government, fall on the Indian government. While the Indian Space Policy 2023 does enable IN-SPACe to set up industry clusters and as the regulator issue

guidelines on liability issues, there is absence of a transparent risk assessment framework entailing an open-ended liability creating an ambiguous undertone to it. This would impose an undue burden on private entities especially start-ups and MSMEs with limited financial capacity and resources. In most countries, the State guarantees excess liability claims or implements the waiver system in the public or government interest. Internationally, regulations are designed to limit the responsibility of private businesses. This is a practice that India can incorporate in its own space legislation. For instance, in Austria and South Korea, space operators must guarantee a specific sum of money for any space activity. The state is required to cover any damage that exceeds the insurance limit. Private organisations, especially start-ups, will have less work to do as a result. A similar strategy might be used in India to promote space innovation, research, and exploration among start-ups. The quantum of liability for start-ups and MSMEs can be capped at a lower amount with extra state guarantees, and any liability claim in excess of that amount can be borne by the state. Startups conducting operations in space for the benefit of the public, such as science, research, or education, or at least in collaboration with the government, may be given a complete release from liability for any claims resulting from such operations, and the government may be responsible for paying any damages resulting from liability claims. It is suggested that the government sets down specific regulations governing eligibility requirements and the kinds of space operations that will be deemed to be in the public interest.

C. **Externalities:** It is no surprise that space faring activities result in negative environmental externalities in the form of pollution (both on earth and outer space), and in case of accidents, in the loss of life and property. Having environmental regulations in consonance with international space law will pave way for more sustainable innovations in the space sector, something akin to reusable rockets in line with the idea of “space sustainability”. Provisions relating to debris mitigation and satellite end-of-life disposal can be added. The 'Space Debris Mitigation Guidelines of the Committee on the Peaceful Uses of Outer Space' is a thorough document produced by the UN Office for Outer Space Affairs that covers a number of potential mitigation strategies. India should include specific provisions in the future law that directly fulfil the international commitments it has undertaken as a founding member of COPUOS and a signatory to the long-term sustainability principles. Additionally, there is also the risk from cyberattacks, especially on communication satellites. With the oncoming of more private players in this sector, the communication technology is more susceptible to cyberattacks and will need a regulatory framwework to cater to these challenges. In such a scenario, it is suggested that any future space legislation explicitly addresses concerns pertaining to “space sustainability” and have provisions for the sustainable use of space resources in line

with SDGs. Additionally, guidelines containing provisions relating to cyberattacks, inclusive of their punishment and nodal authority, can also be included.

D. **National Space Fund[41]:** The National Space Fund's implementation would prioritise financial contributions from space missions and activities. In Russia, the proceeds from space missions and activities are typically used for research; however, with the establishment of the National Space Fund, funds can now be used for both research and liability settlements for damages to space objects. For start-ups and MSMEs, such a shared responsibility for carrying the weight will be advantageous. A solution like this, where the financial resources remain inside the space sector, must be embraced in India as opposed to insurance alternatives, where funds from the space industry migrate to the insurance industry.

E. **Grievance Redressal Mechanism:** With the onboarding of NGEs in the space industry, there is a need to have redressal mechanisms in place that accommodate the private sector. While the Indian Space Policy, 2023, gives extensive executive power to IN-SPACe, it lacks legislative backing. Nevertheless, there is a significant distinction between policies and a national law. Laws are binding, whereas policies just represent the government's plan of action. Therefore, providing IN-SPACe with a statutory status and having a robust grievance redressal mechanism in place will not only make the induction of private players in the space industry smoother, but also cater to any future grievances arising in between the stakeholders involved.

CONCLUSION

India is now ranked fifth in the world for space technology. The satellite launches of the 1950s are now commonplace occurrences that receive little attention. Instead, intriguing new technologies have emerged, such as Internet satellite constellations and future interplanetary launchers. International space law, however, is still static. On the other hand, ISRO has over the years performed admirably. But now that privatization has begun, it is even more important to write local space policy, especially in light of how permissive international space law is. As evidenced by the aforementioned research, India is competent in formulating and visualising guiding concepts for emerging technologies and the space industry. The nation had the foresight and know-how to take part in the process of drafting international space accords even sixty years ago, when its space programme was still in its infancy. Additionally, it actively engaged, and India's influence can be seen in the existing accords. Therefore, it is advised that a complete space law be passed using the knowledge gained in formulating the

[41] https://www.voicendata.com/india-needs-limiting-space-liability-insurance-policy/

international treaties as ISRO begins its new space endeavour. A comprehensive policy that permits the growth of space insurance while also limiting the liability of specific private companies and start-ups will open the door for the establishment of an Indian space ecosystem worth many billions of dollars. The space industry will benefit from a single policy that addresses space debris, security precautions, space insurance and liability, as well as the current remote sensing, communications, and broadcasting regulations.

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