NEED FOR COMPREHENSIVE AND ROBUST INDIAN SPACE LAWS

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Space is for everybody. It's not just for a few people in science or math or for a select group of astronauts. That's our new frontier out there, and it's everybody's business to know about space – Christa McAuliffe[**]

Abstract

Effective space legislation is the ultimate need of the nation, considering the colossal advancements of Indian space research and technology. India being a developing country can be proudly placed on a pedestrian along with developed countries such as the United States and Russia in the area of space research. However, India has no well-defined national space laws unlike many of its developed counterparts. Interestingly countries like Canada, Germany and even Ukraine, which have not progressed as much in space technology have a carefully drafted legal framework. Considering that India is steadily advancing its space-related matters there exists a dire need for comprehensive legislation exclusively dealing with space activities taken up by the country in order to strengthen its position in the global space sector.

Keywords *: Space Law, International Treaty, Technology Transfer, Privatisation, Space Activities Bill*

I. Introduction

SPACE HAS always been a matter of amazement and curiosity for mankind for centuries. The advancement of technology has created fierce competition among various nations in the area of space research. India's relationship with outer space started in the 1960s under the guidance of Dr. Vikram Sarabhai. Since then, India's evolution in this sector has put the nation on a progressive track of becoming a space superpower. In India, according to Government of India

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(Allocation of Business) Rules 1961 (as amended from time to time), the Department of Space (DOS) is the nodal agency for space activities. It aims to work for the betterment of society and national development through its space technology. The space activities of DOS are focused on three major areas, namely, Space Applications, Space Transportation and Space Infrastructure[1]. The Department has been involved in various space activities like the launch of satellites and the launch of space vehicles through ISRO and its R&D centres located in the country.

India created a glorious history by launching 104 satellites into the earth's orbit on February 15, 2017. Starting with a modest beginning almost five decades back, the country has come a long way since then. The launch of 104 satellites simultaneously a couple of years back positively indicates that the country has grown exponentially in the outer space sector despite being a developing country. The country is ushering in an era of privatization and commercialization of space activities, expanding capabilities in space exploration and scientific discovery, commercializing its capabilities to build satellites and offer launch services from indigenously designed and tested workhorse of ISRO Polar Satellite Launching Vehicle (PSLV).[2]

The Indian government is the major contributor towards investment in the country's space sector. ISRO is managed by the DOS, which is under the direct management of the Prime Minister's Office (PMO).[3] The nation has progressed in becoming one of the major superpowers in outer space activities with the help of ISRO which has been working tirelessly for almost five decades to make the country proud. However, the Indian space market is still a closed sector unlike countries such as the U.S., Russia, China and France who have privatized their space market by offering launch services.[4] To advance its activities further, India needs to open its closed doors of the space sector to private players much like other countries. By doing so, the country can attract more investments for monetary support and also invite helpful talent of its bright citizens who are ready to provide their support to ISRO for the advancement of space activities undertaken by the nation. The privatization race of the space sector has long

[1] "Draft Space Activities Bill, 2017", *GK Today*, December 1, 2017, *available at:* https://www.gktoday.in/gk/draft-space-activities-bill-2017/ (last visited on October 16, 2020).
[2] "Space Laws in India", March 19, 2018, *available at:* http://www.legalservicesindia.com/law/article/9/4/Space-Laws-in-India (last visited on October 16, 2020).
[3] "Indian Space Research Organisation (ISRO)", *Skybrokers*, March 8, 2017, *available at:* http://www.sky-brokers.com/home/services/satellite-manufacturers/indian-space-research-organization-isro- (last visited on October 16, 2020).
[4] *Supra* note 2.

been on, with Elon Musk's *Space X* pioneering reusable launch technology, Richard Branson's dream of putting tourists into space and even Bangalore-based *Team Indus* recently took up the Google challenge of putting a space rover on the moon.[5]

India's space-related activities and programmes have expanded rampantly in spite of its humble beginnings. The space achievements undertaken by the nation include the designing and development of launch vehicles and satellites and related technologies; navigation; telecommunication; meteorology; oceanography; predicting natural disasters, space science R&D; planetary exploration to name a few. Today ISRO has some 15,000 personnel in its roster, and its annual budget has crossed INR 100000 million (approximately US$1.3 billion) from INR 60000 million five years ago. Even as its capacities have grown, however, ISRO is unable to answer to every demand for space-based services in India.[6] There exists an acute need for private sector investment in the space sector for it to exponentially grow at a pace in which its counterparts have achieved by opening its space frontiers to private players. India has immense potential and talent to make its space sector one of the most powerful, and just by following the example of other countries which have advanced their space sector well, India too can achieve the highest levels of outer space advancement. Overall growth of the space sector is definitely the need of the hour; hence the Indian government must take a special interest in this sector and formulate appropriate rules and regulations for its comprehensive development.

On September 28, 1992, although India formed a commercial arm of 'Department of Science' called Antrix Corporation, for promotion and commercial exploitation of space products, technical consultancy services and transfer of technologies developed by ISRO[7] the country is yet to see solid private sector participation in this area. The formation of a commercial body under ISRO emphasizes the fact that India is making efforts to become one of the leading space powers in the international space market by opening its doors for outsider participation. However, before, India can go upward India needs a comprehensive space law to cover a wide range of issues concerning the exploration of the final frontiers and help consolidate India's

[5] Ran Chakrabarti, "India: India's Draft Space Law: Opening Up the Final Frontier?", *Mondaq*, December 7, 2018, *available at:* https://www.mondaq.com/india/aviation/761766/india39s-draft-space-law-opening-up-the-final-frontier? (last visited on October 16, 2020).

[6] Rakesh Sood, "An Indian Space Law: Long Overdue", *Observer Research Foundation,* ORF Issue Brief No. 309, (August, 2019).

[7] Monish Gulati, "Antrix: Providing Space Products And Services To International Clients – Analysis", *Eurasia Review,* February 28, 2017, *available at:* https://www.eurasiareview.com/28022017-antrix-providing-space-products-and-services-to-international-clients-analysis/ (last visited on October 18, 2020).

position as an emerging global space power in its own right.[8] With all these developments, questions faced by the Indian government *viz-a-viz* how to regulate access to outer space and whether it must be privatized are critical. Even though the Indian government has a legitimate concern in regulating the space sector, it is equally important not to over-regulate the industry. Over-regulation of the space sector may potentially deter investment in the country or may direct such investments into other countries having more flexible regulations.

II. International Space Laws

Background

The world's first satellite *Sputnik 1* was launched by the USSR in 1957. It marked the beginning of the "*Space Race*" and proved to be the foremost reason for the formulation of international space laws in the following years. Successful launch of *Sputnik 1* authenticated space exploration which was once just a dream for the inhabitants of Earth. During this time, the USSR and the US were trying their level best to be the pioneers in the area of space exploration and the rivalry between the two nations brought about wonders in the space sector, for each nation wanted to be ahead of the other. Just four years into the launch of *Sputnik 1.* On April 12, 1961, Yuri Gagarin became the first person who traveled to space and viewed our beautiful Earth from above. Thus, mankind became space travelers! Later, on July 20, 1969, Neil Armstrong became the first person to "walk on the Moon". This "*Space Race*" encouraged the discussion on the usage of outer space for peaceful purposes only.

Thus, during the years 1957-58 United Nations was approached by the US to ensure the objectives of assuring that future developments in the outer space would be devoted exclusively to peaceful and scientific purposes[9], following which in 1957, the General Assembly of the UN adopted the first UN Resolution on outer space – Resolution 1148 (XII). Since this was the time the UN was faced with maintaining world peace the main focus of the Resolution was on disarmament. UN through this resolution for the first time used the phrase "exclusively for peaceful purposes".[10]

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[8] *Supra* note 2.
[9] Carl Q. Christol, *The Modern International Law of Outer Space* (Pergamon Press, New York, 1982).
[10] Johannes M. Wolff, "'Peaceful uses' of outer space has permitted its militarization – does it also mean its weaponization?", 2003, *available at:* https://www.peacepalacelibrary.nl/ebooks/files/UNIDIR_pdf-art1883.pdf (last visited on November 12, 2020).

With the growing tensions between the USSR and the US *viz-a-viz* technological and scientific progress in outer space, the UN formulated various conventions, treaties, resolutions, declarations *etc.* which further took a form of international space law.

The UN, through the General Assembly Committed on the Peaceful Uses of Outer Space (COPUOS), has confined the International law on outer space into five instruments.[11] These five treaties are:

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

The Outer Space Treaty, 1967 states that the signatory States must carry out any "*exploration or use of the outer space*" for the benefits of every nation on the planet, "irrespective of their degree of economic or scientific development". Article VI of The Outer Space Treaty, 1967 states that:[12]

> States Parties to the Treaty shall bear international responsibility for national activities in outer space, including the Moon and other celestial bodies, whether such activities are carried on by governmental agencies or by non-governmental entities, and for assuring that national activities are carried out in conformity with the provisions outlined in the present Treaty…. When activities are carried on in outer space…. responsibility for compliance with this Treaty shall be borne both by the international organization and by the States Parties to the Treaty participating in such organization.

The Treaty further states that no nation can own the space, the Moon, or any other celestial body. Further, article IV of the Treaty specifies that State Parties to the Treaty must ensure cooperation and no weapons of mass destruction must be used or authorized in orbit or beyond[13]. According to the treaty, an astronaut belonging to "any nation is an envoy of mankind in outer space" and signatory states must ensure any kind of help needed by the astronauts of any other nation.[14] The Treaty imposes liability on the States for any kind of damage to another State Party. It further imposes a duty of informing the Secretary-General of the UN on the

[11] *Ibid.*
[12] The Outer Space Treaty, 1967, art. VI.
[13] 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".
[14] The Outer Space Treaty, 1967, art. V.

signatory states, about any phenomena discovered in outer space which may put the life or health of astronauts in danger.

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

The Legal Subcommittee in the UN negotiated the Rescue Agreement from 1962 to 1967, and a consensus was reached in the General Assembly of UN in 1967, after which the Rescue Agreement came into force in December 1968. Articles 5 and 8 of the Outer Space Treaty state that "States shall take all possible steps to rescue and assist astronauts in distress and promptly return them to the launching State, and that States shall, upon request, assist in launching States in recovering space objects that return to Earth outside the territory of the Launching State".[15]

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

The Liability Convention came into force in September 1972. It elaborates on article 7 of the Outer Space Treaty, 1967 and provides that the "launching State" shall be liable to pay compensation for any such damages caused by its "space objects on the surface of Earth or to aircraft" and liable for any such damages due to the faults of such State in the outer space.[16] 74 countries have ratified, and 27 countries have signed the convention.[17] The Convention further provides as to how the settlement of damage claims shall be approached.

The Liability Convention has put the onus of liability on the State and not any individual. Therefore, it is important for any signatory State to have robust Space Laws to make sure that while entering into any kind of contract regarding space-related matters with another State the interests and benefits of such State are taken care of. However, the non-existence of national space laws does not relieve such a State from the liability ensured under this convention. India had no legislation regarding space-related activities stand at a disadvantageous position *viz-a-viz* other countries.

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

The Legal Subcommittee considered the Registration Convention and negotiated it from 1962. However, it was finally adopted by the General Assembly of the UN only in 1974. Article III

[15] Agreement on the Rescue of Astronauts, The Return of Astronauts and Return of Objects Launched into Outer Space, United Nations Office for Outer Space Affairs.
[16] Convention on the International Liability for damage caused by space objects, United Nations Office for Outer Space Affairs.
[17] *Supra* note 2.

of the Registration Convention provides that "The Secretary-General of the United Nations shall maintain a Register in which the information furnished under article IV shall be recorded".[18] It further provides that the Register shall be of "full and open access" to all the information regarding the signatory States. 37 countries have ratified, and 4 have signed the Convention.[19] According to article IV(1) of the Convention each State shall provide the Secretary-General of the United Nations information regarding "each space object carried on its registry".[20]

Article VI(2) of the Convention imposes the liability on signatory States for providing information regarding any "space object carried on its registry" to the Secretary-General of the UN from time to time.

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

"The Moon Agreement" was adopted in 1979 by the General Assembly of the UN. However, it was only when the fifth country, Austria ratified it, the Agreement came into force in 1984. The Agreement reaffirms and elaborates on many of the provisions of the Outer Space Treaty as applied to the Moon and other celestial bodies, providing that those bodies should be used exclusively for peaceful purposes, that their environments should not be disrupted, that the United Nations should be informed of the location and purpose of any station established on those bodies. [21] Further, the Agreement states that "Moon and other Celestial bodies" do not belong to anyone nation and are the common property of the entire mankind.

f. Five Declarations and legal principles adopted by the UN General Assembly for the regulation of outer space activities by the States:

i. The Declaration of Legal Principles Governing the Activities of States in the Exploration and Uses of Outer Space, 1962 (XVIII)

The UN General Assembly in 1962 solemnly declared that use and exploration of the outer space is open to every nation and the space is not the property of any one nation. Rather, it

[18] 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 on November 1974.
[19] *Supra* note 2.
[20] Convention on Registration of Objects launched into outer space, art IV (1).
[21] Agreement Governing the Activities of States on the Moon and Other Celestial Bodies, United Nations Office for Outer Space Affairs.

belongs to the mankind and its exploration must "and shall be carried in accordance with international law, including the Charter of the United Nations" for the benefits of mankind.[22] No nation shall exert any claim over any celestial body or outer space. Any activity carried out in the outer space by any State shall enhance and maintain international peace and co-operation and such State must take full responsibility of its actions (by both governmental and non-governmental agencies) in space. Such State shall be internationally liable for any mishap or damage to any other State due to its activities in the outer space. Also, the Declaration categorically mentions that the States must regard the astronauts as "envoys of mankind" in the outer space and provide any such assistance required by them in any event of emergency or accident.

ii. The Principles Governing the Use by States of Artificial Earth Satellites for International Direct Television Broadcasting, 1982 (Resolution 37/92)

In 1982 the UN General Assembly adopted the principles governing the use of artificial satellites by the States for direct television broadcasting. It directed the States that such activities must be undertaken in accordance with international law, including the Outer Space Treaty 1967, the Charter of the United Nations and relevant international telecommunication regulations[23]. Regarding the rights and benefits of the States, the Resolution mentions that every State has "an equal right" to undertake any such activity, in the field of international direct television broadcasting and each State is entitled to enjoy such benefits of such activities provided they encourage international co-operation. Further, the Resolution provides for peaceful settlement of disputes in accordance with the Charter of the UN. The principles also mention that the States shall co-operate and protect the copyrights and neighboring rights by undertaking consultations and agreements between the participant States.

iii. The Principles Relating to Remote Sensing of the Earth from Outer Space, 1986 (Resolution 41/65)

Principle I of the Resolution defines the terms remote sensing, primary data, proposed data, analysed information and remote sensing activities as:[24]

[22] Resolution Adopted by The General Assembly, The Declaration of Legal Principles Governing the Activities of States in the Exploration and Uses of Outer Space United Nations Office for Outer Space Affairs.
[23] Resolution Adopted By the General Assembly, Principles Governing the Use by States of Artificial Earth Satellites for International Direct Television Broadcasting, United Nations Office for Outer Space Affairs.
[24] Principle I, The principles Relating to Remote Sensing of the Earth from Outer Space, United Nations Office for Outer Space Affairs.

> "remote sensing" means the sensing of the Earth's surface from space by making use of the properties of electromagnetic waves emitted, reflected or diffracted by the sensed objects, for the purpose of improving natural resources management, land use and the protection of the environment;
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> "primary data" means those raw data that are acquired by remote sensors borne by a space object and that are transmitted or delivered to the ground from space by telemetry in the form of electromagnetic signals, by photographic film, magnetic tape or any other means;
>
> "processed data" means the products resulting from the processing of the primary data, needed to make such data usable;
>
> "analysed information" means the information resulting from the interpretation of processed data, inputs of data and knowledge from other sources;
>
> "remote sensing activities" means the operation of remote sensing space systems, primary data collection and storage stations, and activities in processing, interpreting and disseminating the processed data.

Principles II & III provide that such remote sensing activities must be undertaken by the States in accordance with international law and solely for the benefit of all countries taking into consideration the status and requirements of the developing countries. According to Principle VII, technical assistance of any remote sensing activity taken up by a State must be made available to an interested State provided such States have an agreement towards the same. Also, such a State shall inform the Secretary-General of the UN about any remote sensing activity taken up by it. Such activities must protect the natural environment of Earth. Principle XI provides that States taking up such remote sensing activities must share such data or information regarding any natural disaster with the States which are affected or are likely to be affected by any such impending disaster.

iv. The Principles Relevant to the Use of Nuclear Power Sources in Outer Space, 1992 (Resolution 47/68)

Principle 3 - Guidelines and criteria for safe use, provides for general goals for radiation protection and nuclear safety. Principle 3 (1) provides:[25]

> States launching space objects with nuclear power sources on board shall endeavor to protect individuals, populations, and the biosphere against radiological hazards. The design and use of space objects with nuclear power sources on board shall ensure, with a high degree of confidence, that the hazards, in foreseeable operational or accidental circumstances, are kept below acceptable levels

As provided in Principle 5 the launching State must inform the concerned States upon an event of malfunctioning of its space object carrying nuclear power sources bearing a risk of re-entry into the Earth's atmosphere and provide any such assistance to States, to take any such precautionary steps. Principle 9 imposes the liability of any such mishap on the launching State and provides that compensation shall be determined according to international law.

v. The 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, 1996 (Resolution 51/122)

The Space Benefits Declaration emphasizes that any space activity carried out by a State shall be undertaken to keep in mind the benefits of all mankind, particularly understanding the needs of developing countries. The States must aim at enhancing international cooperation, while particularly taking care of the needs of the developing countries. The States shall aim at the following objectives:[26]

> (a) Promoting the development of space science and technology and of its applications;
>
> (b) Fostering the development of relevant and appropriate space capabilities in interested States;
>
> (c) Facilitating the exchange of expertise and technology among States on a mutually acceptable basis.

[25] Resolution Adopted by the General Assembly, The Principles Relevant to the Use of Nuclear Power Sources in Outer Space, United Nations Office for Outer Space Affairs.
[26] Regulations Adopted by the General Assembly, The 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, United Nations Office for Outer Space Affairs.

Therefore, the above-mentioned five treaties, declarations, and principles are in place regarding the regulation of outer space. However, these rules are largely insufficient to cover all legal issues arising out of private activities in space.[27] India is a signatory to all the above-mentioned Conventions and Treaties. It has been, contributing and participating from time to time in a variety of international forums such as "International Council of Scientific Unions (ICSU), International Astronautical Federation (IAF), UNCOPOUOS, *etc*." An interesting point to be noted here is that even though India is a signing member of all the above-mentioned UN treaties, agreements, and conventions it still has no legislation on outer space and related sectors.[28] Also, even after almost 40 years of ratification of four out of five of the above-mentioned treaties, the Indian government is yet to promulgate solid space legislation for the country. Hence one needs to understand how exactly India regulates its space-related activities.

III. Space-related Policies in India

As mentioned above, India lacks a comprehensive Space Law, but for the time being the regulations regarding outer space are contained in the following:

a. Article 51 of the Constitution

Article 51 of the Indian Constitution provides that for the promotion of international peace and security. According to article 51(c), The State must:[29]

> (c) respect for International Law and Treaty obligation and to encourage settlement of the International dispute by way of Arbitration.

Hence, article 51 of the Indian Constitution obligates the State to work in coordination with other nations and enhance "international peace and security". The State must respect all such international laws and treaties, whether regarding space matters or otherwise, which it is a signatory to and promote harmony among all nations.

b. Article 73 of the Constitution

[27] Taylor Wessing, "Private Space Industry and Its Legal Framework", *Lexology,* June 2, 2019, *available at:* https://www.lexology.com/library/detail.aspx?g=b69fe009-076a-4598-804c-c956ea76045b (last visited on October 16, 2020).
[28] *Supra* note 2.
[29] The Constitution of India, 1949, art. 51, *available at:* https://indiankanoon.org/doc/237570/ (last visited on October 16, 2020).

According to article 73 (1) of the Indian Constitution, the executive power of the Union extends to:[30]

> (a) the matter relating to which Parliament has the power to make laws,
>
> (b) to exercise of such rights, authority, and jurisdiction as one exercisable by the Government of India under any treaty or agreement.

Hence, article 73 empowers the Parliament, any State or any such authority of the State to enact laws to ratify any international treaty, agreement or convention, India is a signatory to.

c. Article 253 of the Constitution

According to article 253 of the Indian Constitution – Legislation for giving effect to International Agreements:[31]

> Notwithstanding anything in the foregoing provisions of this Chapter, Parliament has the power to make any law for the whole or any part of the territory of India for implementing any treaty, agreement or convention with any other country or countries or any decision made at any international conference, association or other body.

Hence, the Constitution empowers the Parliament to formulate any such laws required to implement any agreement, treaty, or convention with other countries or any decision taken by the International Agencies, India is a member of.

d. SATCOM Policy, 1997

The Department of Space along with the Department of Telecommunication and Department of Science and Technology framed the Satellite Communication Policy (SATCOM) in 1997. The policy emphasized developing "satellite communication" and "launch capabilities", developing the infrastructure, promoting "private investment in the space sector" and allowing the use of "foreign satellites for services in India".[32] However, the Government realized that

[30] *Id.,* art. 73.
[31] *Id.,* art. 253.
[32] Nikhil Singhal, "Satellite Communication Policy in India - Time to revisit and revise", *Corporate Amicus* (An e-newsletter from Lakshmikumaran & Sridharan), New Delhi, India, July 2014/Issue 36, *available at:* https://cn.lakshmisri.com/Media/Uploads/Documents/corporate-amicus-july-2014.pdf (last visited on October 17, 2020).

the policy is insufficient to manage the ever-growing space sector and framed "Norms" to help implement the policy smoothly in the year 2000.

e. Norms, Guidelines and Procedure for SATCOM Policy Implementation, 2000

On January 12, 2000, the Union Cabinet approved the Norms, guidelines, and procedures required for the implementation of the SATCOM Policy. The norms provided that such "registered Indian companies" having foreign investment "not exceeding 74%" shall be permitted "to establish and operate satellite systems".[33] By doing so, the Government welcomed private sector participation keeping in mind the tremendous growth in "Satellite-based communication services". Several sub-committees were formed to authorize and sanction the regulations on "sharing of INSAT satellite by private companies on a commercial basis"[34].

It has been 20 years, and we need to rethink the SATCOM Policy and bring about necessary changes keeping in mind the present situations and developments. The new policy needs to include a greater role for the private sector. There must be a consideration of joint maximization of potential by public and private players.

f. Remote Date Sensing Policy, 2011

Remote Sensing Data Policy was framed in 2001 but, was further amended in 2011.[35] The Policy empowered the "Department of Space" as the nodal agency to decide on any action to be taken under the policy. Permission of the Government through DOS regarding operating, acquisition, or distribution of 'a remote sensing satellite' from or within India is mandatory under the policy. The Antrix Corporation has the powers to grant licenses regarding the acquisition or distribution of Indian Remote Sensing data outside India and has the authority to levy fees for granting such licenses. By opening the "remote sensing sector" it focuses on removing any kind of restrictions to ease the access to high-resolution data for developmental activities".[36] Thus, the Remote Data Sensing Policy also provides for private remote sensing satellites.

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[33] Procedures for SatCom Policy Implementation, Department of Space, ISRO, *available at:* https://www.isro.gov.in/update/08-aug-2014/procedures-satcom-policy-implementation#:~:text=The%20norms%2C%20guidelines%20and%20procedures,foreign%20satellites%20for%20SatCom%20Services (last visited on October 17, 2020).

[34] *Supra* note 2.

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

[27] *Supra* note 2.

g. Technology Transfer Policy of ISRO

Technology transfer is a process through which ISRO transfers its technical know-how of the technology created by its centres and elsewhere using the resources of ISRO, to the external entities. In order to further such transfer of technology from its centres to the industry for the production of items required for its space projects as well as outside users, by the industry, ISRO undertook a significant initiative in mid-seventies.[37] The "ISRO Technology Transfer Group" was created to implement the policy. Hence, by allowing transfer of numerous technologies, the Department of Space is furthering commercialisation of the know-how of different disciplines of space-related technologies. Multi-pronged initiatives resulted in terms of the group's work for awareness building, quality assurance, selection criteria for industries, know-how pricing principles, innovative contract systems and so on.[38] The main objective for conceiving the technology transfer policy was to encourage Indian industry participation in the outer space activities of ISRO. It also aimed to grab the advantages of "spin-offs of such technologies" created.[39] The policy enables the industry to acquire licensing of the technology know-how from ISRO centres. Technology transfer cases, fall under the following:[40]

i. Technologies for ISRO buyback.
ii. Technologies for the development of space systems utilisation and space applications.
iii. Technologies for the development of 'spin-off' or non-space applications.

To create awareness among the industries, ISRO publishes such information regarding technology transfer on its website and other trade journals to invite applications for the same, from time to time. In order to facilitate the transfer of technology to both public and private sectors for industrial and national development, ISRO created a public sector company called 'New Space India Limited (NSIL)', in March 2019. According to ISRO Chairman K Sivan, "The main objective of this new company will be to act as a mediator or link between ISRO

[37] K.R. Sridhara Murthi and Mukund Kadursrinivas Rao, *India's Space Industry Ecosystem – Challenges of innovations and incentives* (2014), 65th International Astronautical Congress, Toronto, Canada, by the International Astronotical Federation.
[38] K.R. Sridhara Murthi and T.S. Shoba, "Technology Transfer Trends in Indian Space Programme", 67 *Acta Astronautica* 942, 2010.
[39] A.Bhaskaran, "Competence building in complex systems in developing countries: the case of satellite building in India", *Technovation* 21, 2001.
[40] Technology Offers, SAC Industry Portal, *available at:* https://www.sac.gov.in/SAC_Industry_Portal/technology.html (last visited on November 15, 2020).

and the industry and facilitate the transfer of ISRO technologies to private companies. Till now, ISRO had to directly engage with private companies and oversee the entire process of technology transfer."[41] Till now, ISRO has transferred over 300 technologies to different potential industries.

IV. Need for a Comprehensive National Space Law

Recent developments in outer space-related activities in India have further strengthened the debate for the need of comprehensive domestic space law to cover a wide range of issues to help India to integrate its position as an emerging global space power. The role of the Indian judiciary is to interpret the existing legislation of the country. However, in the absence of specific legislation about space activities, the judges become hand tight in deciding such matters. Also, with the recent inclusion of private players in the space sector, the absence of comprehensive legislation creates a vacuum and lacks the much-needed clarity for such private players. It's time that the government thinks seriously about formulating a robust space law in order to boost and accelerate the scope of space activities piloted by ISRO, which has made its mark by making India one of the leading nations after its successful missions to the Moon and Mars.

Even though legally binding international treaties are essential to regulate the growth of outer space activities[42], a domestic space law to regulate its space activities in unison with the international treaties is extremely essential for any country. Unfortunately, India even though being one of the leading countries, undertaking successful space activities, hasn't yet formulated its domestic law to regulate the outer space activities of the country, which is one of the major reasons that India is still not considered at par with countries like the USA, Russia, and China. Lack of domestic space laws puts the country in a disadvantaged position and plays a hindrance in the growth of its space activities on the global front.

On March 27, 2019, India shot down one of its satellites which created 400 pieces of orbital debris, some of which fell on a Japanese village. Under the "Convention on International Liability for Damage Caused by Space Objects, 1972" India had an absolute liability to pay a suitable compensation for the damage caused by its actions. However, there exists no

[41] Surendra Singh, New space company to facilitate ISRO tech transfer to industry, *The Times of India,* February 21, 2019, *available at:* https://timesofindia.indiatimes.com/india/new-space-company-to-facilitate-isro-tech-transfer-to-industry/articleshow/68087995.cms (last visited on November 15, 2020).

[42] Radhakrishna Rao*, "*Why India Needs a Comprehensive Space Law?", *Indian Defence Review,* May 7, 2016, *available at:* http://www.indiandefencereview.com/why-india-needs-a-comprehensive-space-law/ (last visited on October 17, 2020).

international space law to determine the quantum of such damage. Also, according to NASA Administrator Jim Bridenstine, this act of India increased the risk of debris in space, colliding with the International Space Station by 44%[43]. International Space Station is an artificial satellite that is orbiting the Earth at an altitude between 330 and 435 km which is a 'joint project between the USA, Russia, Europe and Canada'. It provides as a research laboratory for these countries and helps them to conduct numerous space experiments. It is not in India's favour to be the centre of such controversies. And in the absence of any domestic law regarding such events, India would always be in a disadvantageous position to negotiate.

National space law is further needed to regulate space mining activities which is a whole new industry through which extraction of valuable minerals from Space Objects like Moon, Planets, Asteroids *etc*., is done. The USA, under the US Commercial Space Launch Competitiveness Act, 2015, has already taken important steps towards strengthening this industry. By doing so, NASA can focus on what it does best: research and development while private players like SpaceX can share its burden. This healthy relationship between the government and private sector has helped the US become a space leader of the world. In contrast, India has no such law to regulate the space mining industry, which puts the country in an extremely detrimental position.

The 'concept of Space War', which was just science fiction, and a subject of sci-fi movies has become a reality today. With the help of their advanced space technologies, the elite countries have the power to oppress other countries for their advantage. Few examples are Russia jamming the GPS reception of Ukraine, China hacking into US weather satellites, North Korea jamming the signals over demilitarized zones *etc*.[44] Keeping such developments in mind, India needs to build a strategy to stay safe in outer space too. Comprehensive space legislation is needed to take care of related military needs ensuring space security as China is galloping ahead with the motive to create "killer space devices". Incidentally, to showcase its military prowess in 2007, China dismantled one of its long ageing weather satellites by using a ballistic missile. This act of China attracted a huge amount of international criticism. The then Defence Minister, Mr. A K Antony expressed India's concerns over the "emergence of anti-satellite

[43] "India's shooting down of satellite created 400 pieces of debris, put ISS at risk: NASA", *The Economic Times,* April 2, 2019, *available at:* https://economictimes.indiatimes.com/news/defence/indias-shooting-down-of-satellite-created-400-pieces-of-debris-put-iss-at-risk-nasa/articleshow/68682165.cms?from=mdr (last visited on October 17, 2020).

[44] Anubhav Pandey, "Reasons why India need a robust Space Law", *ipleaders*, June 30, 2017, *available at*: https://blog.ipleaders.in/reasons-india-needs-robust-space-law/ (last visited on October 18, 2020).

weapons", in his address to the United Commanders Conference in New Delhi in 2008. Strategic analysts are of the view that Indian military should also look at the need ensuring the security of Indian 'space resources and assets' against the backdrop of a belligerent and resurgent China making efforts to deploy anti-satellite and killer satellite devices.[45] An effective national space law will ensure the security of Indian space resources and assets in any such eventuality of space war and, in turn, empower the defence front of the country.

Further, safeguarding of intellectual property rights is a matter of high complexity with regards to legal issues. Even though India is marching steadily ahead in its space programmes it lacks an adequately formed legal regime to protect its own as well as the intellectual property rights of external players involved, which is truer "with respect to data protection" and has "adverse implications both for industry and national security".[46] Keeping this in mind the Indian Copyright Act, 1957 must be revamped to suit the current changes in the space sector. Even though the Information Technology Act, 2000 came as a respite in connection with "electronically transmitted information" however, with no specific legal regime present, with regards to data protection puts the country in a detrimental position in this area too. Hence, the government must also take serious action with regard to the enactment of the Personal Data Protection Bill, 2019.

In order to reduce the burden shouldered by ISRO, it is high time the government opens the gates for private players to contribute to space-related activities. Perhaps it would be the biggest contribution of any proposed space law for the country to clear the deck for private sector participation in building space launch vehicles and related space activities, which may cater to both national and international customers. However, just opening the Indian space sector to private participation is not enough. The government needs to clarify the rules and regulations for any possible unforeseen mishap on the part of private companies while undertaking space exploration activities. India is a signatory to the Liability Convention, which imposes the liability of any damage on the launching State in case of any damage caused to another State. The future space legislation needs to specify who will be liable to pay damages in such an event – the government or the private company. It is important to mention here that when most of the international treaties were formulated and signed, almost no country had allowed private participation in their space sector. Hence, these treaties did not contain any mention of

[45] *Supra* note 28.
[46] R. Kaul and R.S. Jakhu, "Regulation of Space Activities in India", in R. Jakhu (eds) *National Regulation of Space Activities: Space Regulations Library Series,* Volume 5, 153 - 198 (Springer, Dordrecht, 2010).

prospective private participation in the space sector. The Indian government needs to specify clearly how the private activities in this sector will be regulated and what international ramifications such activities may have on the domestic companies. Increasing private participation through the call of the hour, may give rise to inequality in "space exploration in the world".[47]

In June 2020 the government gave its nod for the formation of Indian National Space Promotion and Authorisation Centre (IN-SPACe), to regulate private participation in the Indian space sector. Apart from being a regulator, IN-SPACe will also be a facilitator between the public and private sectors with regard to space-related activities in the country. By bringing in such organizational reforms, the government assures greater private participation to fulfill the Indian dream of becoming one of the leading countries in space exploration. However, here lies the catch! While the intent is just what India needs, the implementation of the same (as always) can be a challenge.[48] Such outsourcing to private players can be possible only through comprehensive space legislation, which ensures proper licensing and registration of such private companies.

The remote sensing data market is devoid of an international regulatory framework and is regulated by the States on their level. In this scenario, the states not having 'remote sensing capabilities' are at a detrimental position. India on the other hand has been furthering its remote sensing capabilities successfully, but with no comprehensive legal framework at the national level puts it at a disadvantageous pedestrian in light of the absence of an international regulation too. Further, the issues of intellectual property arising in remote sensing technology have no mention in either international space law or the TRIPS Agreement.[49] The United Nations needs to negotiate a fresh treaty for the regulation of IPR issues in space technology. Recent developments in India indicate the willingness of the government to allow participation of private satellite systems. However, such transfer of property and commercialization of remote sensing services, data processing and distribution in the future will undoubtedly raise IPR protection issues among other legal matters[50] in light of no adequate national space legislation

[47] Vidhi Bubna, "The upcoming Space Activities Bill in India and what it needs to address", *moderndiplomacy,* September 11, 2020, *available at:* https://moderndiplomacy.eu/2020/09/11/the-upcoming-space-activities-bill-in-india-and-what-it-needs-to-address/ (last visited on November 16, 2020).
[48] Ameeta Verma Duggal, "Niggling policy gap in India's ambitious space odyssey", *Moneycontrol,* July 8, 2020, *available at:* https://www.moneycontrol.com/news/india/niggling-policy-gap-in-indias-ambitious-space-odyssey-5525291.html (last visited on November 16, 2020).
[49] S.G. Sreejith, "The Patent Law for Outer Space-related Intellectual Property Rights Issues: An Odyssey into TRIPs 14 *IJIL* 180, 2005.
[50] *Ibid.*

yet. The Space Activities Bill, 2017 to some extend addressed these concerns however, it too lacked operational clarity.

The feat of simultaneously launching 104 satellites into the earth's orbit a couple of years back portrayed India to be a reliable and cost-effective country, as a launching pad for satellites. This, in turn, attracted several offers from many countries for the same. However, the lack of a national space law puts India in a critical position while entering into any such agreements with a multi-national company or another country, for that matter of fact.

The Finance Minister, Mrs Nirmala Sitharaman, in May 2020 announced that, the government is keen on opening up the space sector for private players and it wants to share the facilities of ISRO with the private sector, in order to strengthen its dream of 'Aatma Nirbhar Bharat' (self-reliant India). The Minister mentioned that she very well understands that private sector participation can immensely help in expanding the space capabilities of the country. Sitharaman's announcement entails a role for the private sector, possibly with the goal of greater investments in technology development and acquisition, capacity-building and space exploration, including planetary exploration.[51] But as usual, the implementation of such policies is very important and without any proper space law and in the absence of a regulatory body, it certainly is not possible to implement such policies however benefitting that might sound. Further, announcing such policies from time to time is just mere lip service on the part of the Indian government. Unless a revolutionary change is brought in the regulatory regime, there is no hope of the space reforms resulting in the creation of a commercially successful and innovation-driven space sector.[52]

In an interview, Dr. V. Balakista Reddy, head of Centre for Aerospace and Defence Laws, NALSAR University, specified that around fifteen countries have nearly forty legislations dealing with space technology and its applications, and it is high time India learns from them by enacting its own national space legislation.[53] Therefore, there is a growing demand for an effective and robust legally binding national space law awning all the contemporary space-related issues and concerns in order to enhance the position of the country in the outer space front.

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[51] Rajeshwari Pillai Rajagopalan, "India's Space Programme: A Role for the Private Sector, Finally", *The Wire*, May 22, 2020, *available at:* https://science.thewire.in/space/nirmala-sitharaman-indian-space-programme-isro-private-sector/ (Last visited on October 17, 2020).
[52] *Supra* note 48.
[53] Interview with Dr. Balakista Reddy, head, Centre for Aerospace and Defence Laws, Nalsar University, *The Times of India*, September 30, 2020.

V. Space Activities Bill, 2017

The Draft Space Activities Bill, 2017 introduced and discussed in the parliament in November 2017 failed to be passed and later lapsed on technical grounds. It aimed at encouraging both public and private sector participation in the space programme under the authority and guidance of the government of India through the Department of Space. This bill proposed to regulate and promote space activities in India.

Lately, quite a few 'start-up companies' have shown interest in space-related activities. Keeping these developments in mind and encouraging non-governmental participation, this bill struck the right chord. According to the bill, "there is an urgent need for a legal environment for orderly performance and growth of space sector".[54]

a. Salient Features of the Bill

- The proposed bill applies to every Indian citizen residing in or outside India and also to all sectors, whether governmental or non-governmental, engaged in any space programme in or outside India.
- The Central Government shall issue a license to any person or company which proposes to carry out commercial space activities. Such licence shall be non-transferable.
- The Government shall provide technical support for any such space activity. However, such space activities may be strictly regulated by the Central Government and make a call for periodic supervision and scrutiny by the DOS.
- The bill directs the Central government to "create and maintain a register of all space objects" (already launched or proposed to be launched into outer space) and formulate a proper plan for further constructive space activities.
- The Central Government shall have complete rights of supervision and investigation into an occurrence of any accident which may take place in relation to any such operation of space activity.
- The Bill also has the provision for disclosing the detailed price of the products which are created using the space technology to any person or company in a well-prescribed manner.
- The bill offers the ownership of intellectual property rights to the Central government of any such property created or generated in outer space.

[54] "Draft Space Activities Bill, 2017", Department of Space, Government of India.

- The draft bill also proposes punitive action against any person undertaking any "commercial space activity" without prior authorization from the Central Government. Imprisonment for up to three years or a fine of more than INR one crore or both is prescribed as punitive action in relation to such activity by any such person.

b. Positives of the Bill

The Space Activities Bill, 2017 is an amalgamation of countless years of research on several "international guiding principles" aiming to create legislation for the country regarding outer space activities.[55] It aims to deconstruct government monopoly in the space sector and encourage essential private sector involvement. By evolving the mechanism of licensing, the bill certainly reflects on the intention of the government to set up a transparent and clear procedure. The bill specifically defines[56] "space players", "licences", "space objects", "commercial space activity", geography and violations. It also specifies in detail the guidelines for the non-government stakeholders and start-ups looking to work along with the government in the space sector. It also gives confidence to these players to invest in Indian space activities. This in turn may generate jobs and further India's dream of becoming a global commercial centre for space activities. By providing very limited grounds for refusing the grant of a license by the Central government in section 7(2), the bill positively reflects a promising intention of the State to promote and advance the outer space technology start-ups in the country by ensuring minimal barriers of entry.

c. Does the Bill deliver what it was introduced for?

The bill which was meant to provide a thrust to private participation will create uncertainty instead as it lacks operational clarity. One of the major lacunae of the bill is its focus on licensing regimes in space programmes to govern the activities and developments of non-governmental participation. This may need more operational clarity for the said business. For example, in his article Narayan Prasad, the host of the NewSpace India Podcast, explains, "a company planning to build, launch, and operate its own spacecraft to provide services over India will need access to space frequencies for telemetry, telecommand and payload operations. Similarly, a company looking to establish its own private launch vehicle will need necessary

[55] *Supra* note 32.
[56] *Supra* note 34, s. 2.

clearances to conduct tests through authorized access to potential launch ranges".[57] A careful reading of sections 3 and 5 of the bill suggests that it does not provide any clarity on the important question of who will be eligible to obtain the licenses for the space activities and what would be the limit to these space activities by such licensed operator.

The draft bill fails to specify or even establish an independent authority responsible to enforce the provisions of the bill or govern the space activities. According to the space activities draft bill, "The Central Government may, by notification, make rules for carrying out the purposes of this Act", including "the manner of providing authorization to launch or operate commercial activities".[58] The regulatory mechanism required for various space activities is structurally different too. But the bill does not provide for specific agencies with separate regulations for each type of activity, unlike the US Commercial Space Launch Competitiveness Act, which provides for separate sections for space resource utilization, remote sensing, spacecraft and operations, launch vehicles etc. with specific regulations. Therefore, passing the space legislation without specifying the individual mechanism for different activities will create confusion in the minds of the emerging companies and investors.

Another area the bill fails to cover is liabilities for damages to the "third-party space assets". This is a very important point that should be included if the bill is reconsidered, as India is a signatory member to the above-mentioned UN Treaties on Outer Space Activity.

The fact that the intellectual property created or generated will be owned by the central government is very strange. The whole point of a start-up is to create or generate something novel and bet on intellectual property. But taking away the ownership from the creator will rip the inventor off the fruits of his labour. This needs to be reconsidered.

While the bill was a positive step towards regulating the space sector of the country it requires to be further fine-tuned to provide clarifications on certain provisions. It also needs to ensure a delicate balance between private and public sector participation by establishing an independent authority responsible for the implementation of the regulations of the bill. The Indian government must reconsider the lapsed bill and make necessary amendments to it in order to safeguard the above-mentioned concerns.

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[57] Narayan Prasad, "Space Activities Bill, meant to boost private role, will create confusion instead", *The Print*, October 11, 2019, *available at:* https://theprint.in/science/space-activities-bill-meant-boost-private-role-confusion/303950/ (last visited on October 18, 2020).
[58] *Supra* note 34, s. 29.

VI. Conclusion

The Global space is rapidly changing, and India is definitely emerging as an outstanding country in the international space market. The farsighted vision of *Dr Vikram Sarabhai* gave India an extraordinary pragmatism and distinctive objectives for the use and exploration of outer space for the socio-economic development of the country. Today ISRO's success has made India proud and instated India into the elite group, consisting of space leaders and is being acknowledged as an emerging space power in the world. ISRO not only caters to the socio-economic needs of the country but very much to its military needs and has made a tremendous contribution towards the development and security of the country.

However, India is devoid of legislation regulating outer space activities which has from time to time, put the nation in a disadvantageous position. Unlike other leading countries like the US and Russia, which have a solid space law regulating the space activities in their countries, India has none, even though being an active participant in this area since the Independence, till in 2017, when the government tabled the Space Activities Bill, which unfortunately lapsed. This portrays a lack of seriousness on the part of the government towards ensuring legally bound space exploration activities in our country. In spite of having the best of minds in its space agencies, India is unable to harness its quality expertise. Without any policy initiatives, India will encounter serious constraints in meeting the demands of both the commercial and defence sector.

The draft Bill introduced in 2017 was a welcome start in building a legally binding framework for a strong and prosperous future of space industry. However, the government must not exceedingly regulate the sector, which may discourage private participation and foreign investment in India's future space endeavours. The bill provided maximum powers to ISRO as a licensor, operator, rules maker and service provider. If the government intends to keep the authority tightly in its own hands, it may create confusion in the minds of the private players who are genuinely looking forward to contributing and invest both intellectually and monetarily in the space sector activities of the country. The government needs to take a look at how independent players have excelled in App development and transformed the digital sector as a whole. Such private players can definitely help in easing the burden of ISRO, which is already overburdened. Therefore, the government needs to be cautious about getting the right balance so that it attracts active private sector participation and also work towards the national interests of the country.

India must learn and imbibe the positive policies adopted by the leading space players like the US, Russia, China *etc.* For few decades, the US government has relaxed its space monopoly and encouraged private participation in terms of investment and research, this has proven to be extremely beneficial in promoting tremendous growth in the sector of space exploration. The draft bill did mention private participation but, unfortunately, was very unclear and vague in its explanation of the extent of such participation. Also, the government citing national interest and security, stated that any intellectual property of a novel invention in the space sector by a private player would be owned by the government and not the inventor. This will discourage active private participation as the inventor will not be able to reap the benefits of his inventions. The government needs to seriously rethink the draft bill on these lines too. Therefore, commercialization of the space sector will benefit the country only if an appropriate and balanced outer space legislation is formulated, either as comprehensive legislation or as regulation for specific sectors.

In order to be among the dominant elite group of countries, India needs comprehensive and robust space legislation positively backed by significant rules and regulations which provide a balanced approach in the areas of certification, licensing, space liability, space insurance, private and foreign investment, infrastructure building, IPR and international cooperation. Moreover, a national space law would help strengthen the defence sector and also help it build a space war strategy in case of any such event in the future. In other words, it would be win-win progress of all participants, both public and private, in the Indian Space Sector.