

EMERGING SPACE ISSUES UNDER THE RULE OF LAW

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ABSTRACT

Law and space technology are both developing steadily, and concerns that arise from these developments need to be addressed at the same rate. Even if the development of space technology benefits governments greatly on both a national and worldwide scale, it is necessary to combat these issues with a well-organized legislative framework. This research examines the notion of outer space and provides a quick overview of the space rules and regulations in order to highlight any gaps in existing conventions and treaties. The growth of the public sector in space, the rise in space debris, the legal status of space mining, and the established regulatory framework are other challenges that have come to light. Additionally, this article provides brevity on these subjects and ends with the point.

Keywords: Outer space, Outer space treaty, space laws, space debris, space mining

INTRODUCTION

The changing dynamics of technological advancement and the development of human civilization are expanding humans' quest to explore outer space. The odyssey to go beyond earth's atmosphere has not only attracted many splendid inventions and discoveries but has also created the necessity to make space laws. The practice of international legal principles in the modern world's space industry is a relatively recent area of the law. The expanding legislative framework is actually the result of contemporary issues emerging from ambiguity in space sovereignty, control, and protection. Most of the leading scientists consider the date of the beginning of legal

relations concerning space exploration as 1957, which is well known as the year when the first artificial satellite was launched into space. At that time, there were no comments or objections from other states concerning this event. There was no state that asked the question of sovereignty. The lack of protest from members of the international community led to the freedom of scientific exploration in space. This rule helps to expand the area of space research (Tronchetti, 2013). The need for new space law principles is driven by four main factors:

According to Fabio Tronchetti, a pioneering author in the field:

- (a) technological advancements;
- (b) increased capability to launch satellites directly into orbit;
- (c) the expansion of new commercial space operations; and
- (d) the evolution of new technical and legal developments, problems, and issues that were not anticipated or found to be significant at the time the UN Space Treaties were drafted.

I. Definition of 'outer space'?

This perennial item has been on the agenda of the COPUOS for many years, most recently under a title of 47 words. At the most recent session of COPUOS (the Committee on the Peaceful Uses of Outer Space), all the various views have been reiterated, from the opinion that a conventionally defined boundary between air and outer space is necessary or that any object launched into outer space be considered to be in outer space at all stages of its flight when its altitude exceeds 110 km, to the opinion that the need for a definition has not yet

been established and that a prematurely adopted definition might complicate and impede progress in the exploration and use of outer space.

II. Existing Space laws and regulations

The term "Space Laws" essentially refers to all of the guidelines, standards, and directives. The United Nations Office for Outer Space Affairs (UNOOSA) is the main international organization that deals with space-related issues. The UNOOSA's primary responsibilities are:

- Ensuring that space is used peacefully.
- Controlling space exploration.
- Ensuring the application of space science and technology for long-term economic growth.
- The use of space to advance social development.

This convention additionally provided assurance that the use of space was to be limited to peaceful purposes and for the benefit of humanity. It also outlined how to move forward:

- The promises made in the pact were implemented. (Peaceful coexistence, international collaboration in space-related issues.
- Asked the treaty's signatory nations to expedite ratification of the agreement.
- The agreement expressed the expectation that it would be upheld successfully for a very long time
- Asked the committee to follow specific rules for peaceful uses of space:
- To reach a consensus on who will be responsible for any harm brought about by the proper launch of spacecraft.
- To reach a consensus regarding astronaut and spacecraft assistance (returns and support).
- To come up with a clear concept of space and the methods used to use it.
- To determine the various effects of space communication.
- Report on the development of the 22nd General Assembly Session's work.

Despite these regulations the non-existence of these issues were not seen. To get the idea of such issues, some are discussed below:

- Any nation that does not have space laws.
- Exploring options and related matters.
- responsibility and damages brought on by space objects.
- Safety and spaceship and astronaut rescue.
- staying away from dangerous interventions.
- avoiding changes to the environment.
- carrying out scientific investigation techniques.
- Process for resolving conflicts.

III. TREATIES AND CONVENTION GOVERNING SPACE LAWS

Due to the vastness of space, it is not that easy to adjudicate it. And the same reason for the quest of human mankind to explore space. Majorly, there are some UN's treaties that deals with laws of outer space, as follows:

A. Outer space treaty

Outer space treaty of 1967, formally known as Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space. This treaty focuses on topics including armament control, the freedom of member countries to explore, and the non-appropriation of space by any one government. At that time it was signed by three countries: The Russian Federation, The United Kingdom, The United States of America. According to Article 1 of this treaty, "No action taken by any State can permit them to make claims of sovereignty over outer space, including the moon and other celestial bodies."

B. Rescue Agreement

Rescue treaty also known as Agreement on the Rescue of

Astronauts, the Return of Astronauts and the Return of Objects launched into Outer Space. It deals with safety and rescue agreement of astronauts and spacecraft and try every possible way to help them in situation of distress. It was approved by General Assembly in 1967.

C. The Liability Convention

According to Article VII of Outer Space treaty ,

- Each state party of the treaty procures the right of launching objects into outer space, including the moon and other celestial objects.
- They shall be internationally held liable if their object harms any other state, property or person.

Liability Convention basically elaborate above article of OST reached to an agreement in the UN assembly in 1967 , and focuses on the prevention of harmful interference with space activities and the environment as well as accountability for damage caused by space objects

D. Moon Agreement

Formally known as Agreement Governing the Activities of States on the Moon and other Celestial bodies. This treaty happened after passing of resolution 34/68. The primary task of this treaty were to confirm the other provisions of the outer space treaty apply to the moon and other celestial bodies. The moon and other celestial bodies must be used for peaceful purposes and no harm must be caused to the environment. The United Nations must be informed of any station to be established on the moon and other celestial bodies. No international body or state is

allowed to use these bodies for the purpose of exploitation.

IV. EMERGING ISSUES

With the growing domain of space technology and laws, there are emerging challenges. Major issues have been discussed below:

A. Growing participation of the private sector entities in outer space

The power of private innovations in space domain has seen tremendous growth. Though it has various beneficial factors but has challenged security of a nation and ambiguous limit to exploitation of space for economic development.

1. Why should the private sector be involved in space industry?

Private entities can contribute the creativity required to create space-based services and applications. Additionally, with satellite data, photos, and space technology being used in the majority of sectors, demand for these services is increasing globally. For instance, The United States, Europe, Russia – all have space industries with big players like Boeing, SpaceX, Air Bus, Virgin Galactic, etc. Involvement of private sector benefit as it:-

- Demand for space-based service is growing steadily. To meet the demand this, engagement of private entities are encouraged
- Private sector participation is needed to ensure overall growth of the space sector. For instance, ISRO has a strong association with the industry, particularly with Public Sector Undertakings (PSUs) like Hindustan Aeronautics Limited and large private sector entities like Larsen and Toubro. Role of private industries should be increased.
- Greater pool of resources: Public resources- land, labor, capital are limited. Private sector participation will open a new pool of resources and talent. It will bring more funding, and experience into space

exploration activities as well as human capital.

- Private sector helps to share the risk of cost factor, reducing failures due to increased human capital and mind.

2. Issues and Concerns of private participation in space industry

Article 1 of the Outer Space Treaty (OST) states that “State Parties to the Treaty have international responsibility for national outer space activities, whether carried out by government agencies or by non-governmental entities.” It also clarifies that the “appropriate State is responsible for authorizing and supervising all non-governmental entities’ activities.” The Article establishes a dual structure where, at the same time, private actions are allowable, but the obligation remains with the States. *Liability Convention of 1972*, it throws up a lot of questions. For instance, the Liability Convention distinguishes between strict and fault-based liability but does not answer the question of who is the “owner” of the space entity causing the accident and who is “responsible for it.

Issues emerged by private sector involvement are as such :

- Though space it gives an opportunity to entrepreneurs but raw data of ISRO in the hands of the public is sensitive and consists of danger of misuse or improper utilization of data
- Regulating private sector participation is difficult even though it is a profitable investment. Investor decision-making may be hampered by the length of time required for regulatory approvals and the instability of political institutions.
- Allowing the private sector to operate could result in lobbying and unethical tactics of obtaining space projects or the launch of any satellite for their own financial gain. Additionally, private players may leak private information to other

nations and businesses in order to profit from it.

However, due to the fact that only States are covered by the treaties, States are the only legal entities that, depending on the state in which the space object is registered, carry the greatest amount of international liability. Unless strict guidelines are established by national space legislation, such as liability insurance responsibilities, in an effort to protect themselves from liability, such a presumption places governments at great risk of compensation.

B. Increasing Space debris, collusion, containment

Tones of rockets, spacecraft, and equipment have been launched into space since the space era began in 1957. Since then , the amount of harmful debris has multiplied and been produced by tens of thousands of explosions and collisions in space without any plan of destroying them after they will passed away . Space debris can pose an operational spacecraft satellite navigation threat, particularly in the Geostationary Satellite Orbit, where it can drift, raising the risk of colliding or interfering with transmissions of operating satellites. As of 2021, the United States Space Surveillance Network was tracking more than 15,000 pieces of space debris larger than 10 cm (4 inches) across. According to the *Liability Convention of 1972*, if the harm is due to negligence, the “launching state is responsible for damage caused by a space object or to people or property of some other state on board. This statement poses two critical issues: on the one hand, negligence is difficult to prove, because ‘space traffic laws’ do not exist systematically, and on the other hand, it is an impossible task to decide who is liable in the majority of cases, taking into account the complexity of the origin of the majority of space debris. Holger krag explains ,”“In

view of the constant increase in space-traffic, we need to develop and provide technologies to make debris prevention measures fail-safe, and ESA is doing just that through its Space Safety Programme. In parallel, regulators need to monitor the status of space systems as well as global adherence to debris mitigation under their jurisdiction more closely".

International guidelines for sustainable use of space and space traffic management

- Design rockets and spacecraft to minimize the amount of 'shedding' – material becoming detached during launch and operation, due to the harsh conditions of space
- Prevent explosions by releasing stored energy, 'passivating' spacecraft once at the end of their lives
- Move defunct missions out the way of working satellites – either by de-orbiting them or moving them to a 'graveyard orbit'
- Prevent in-space crashes through careful choice of orbits and by performing 'collision avoidance maneuvers'.

But mere guidelines are not enough to tackle this issue, we need to implement an international treaty that would offer binding legal and technological provisions governing the management and prevention of space debris at all levels of a space operation in order to satisfy all legal concerns and have a holistic approach to this problem.

C. Space Mining Activities

The scientists believe that the moon and other celestial bodies can have many sustainable resources which might pave a way for providing resources for future generations. Article II of the Treaty on Outer Space (OST) of 1967, states that 'Outer space, including the Moon and other

celestial bodies, is not subject to national appropriation by demand of sovereignty, by use or occupation, or by any other means.' First, it is debatable as to whether mining is per se included in the term 'appropriation'. NASA has long believed that the term means that space mining is legal: "We also believe that, just like in the ocean, you can extract resources from the ocean. But that doesn't mean you own the ocean. You should be able to extract resources from the Moon. Own the resources but not own the Moon." The ability of governments and their citizens to engage in unrestricted space mining may be constrained by other binding laws even if mining is not seen as a prohibited national appropriation. It is forbidden for countries to contaminate celestial bodies, according to Article 9 of the aforementioned Outer Space Treaty. Countries, including Saudi Arabia and the United Arab Emirates, are setting up national legal frameworks for the commercial use of space resources with regard to celestial bodies. Some have expressed worry that the US government's funding for for-profit space firms will probably entrench Earthbound Wealth Inequalities in orbit.

D. Unclear Dispute Resolution

There is currently no established forum that can appropriately resolve problems connected to space legal activity. The conventional conception of space law was that it was essentially a domain of governmental activity. The collection of international space treaties, which were negotiated and passed in the 1960s and early 1970s, show that the focus of the drafters was on government rather than commercial uses of space. Although the private use of space was contemplated, these treaties primarily believed that future disagreements between governments over space would be resolved through diplomatic negotiations. Despite the fact

that there haven't been any major international disputes caused by accidents in space that have caused enough financial or other harm to necessitate changing the treaties or laws, the likelihood of such an accident increasing every year, especially due to the clogging of orbits with satellites and man-made debris.

History has demonstrated that when it comes to determining who is to blame for damages that occurred in space and were caused by various governments, engaging in direct diplomacy and coming to a negotiated agreement is typically the first and most effective course of action. Additionally, conversations surrounding the Cosmos 954 accident and subsequent international space accidents have established a precedent for employing diplomacy to resolve government-to-government space incidents. On the other hand, with the rapid growth of private investment in space, particularly in the telecommunications and direct broadcast TV industries in Geosynchronous Earth Orbit (GEO), along with proposals for Low Earth Orbit (LEO) broadband systems incorporating large numbers of satellites, where it involves private claims involving space collision, there have been no clearly established frameworks to address the issues of private claims involving space collision. In cases of private to private parties (where both parties are domiciled in the same state), private to private parties (when both parties are from different states), and private parties and another foreign government, the issue of who decides disputes arises. The resolution of these disputes has been approached in a variety of ways. For instance, if a foreign government (plaintiff) and a private actor were involved, the plaintiff government might attempt to sue the private actor in a national court, but it might be challenging to enforce the decision of its own "home" court against a foreign defendant. Potential

issues still exist, particularly if one team is thought to have an advantage on "home soil."

CONCLUSION

Multilateral accords and treaties are no longer effective in regulating international space activities due to the changing patterns we are currently experiencing and the increasing number of non-traditional stakeholders. It is obvious that the current global space governance framework is no longer adequate in an era where space is evolving and developing more quickly than intergovernmental organizations can keep up, necessitating the need for more revised or, rather, additional laws to ensure stronger global space governance as well as the safety and sustainability of space for the future. The commercial exploitation of outer space and space debris is one of the most critical issues facing the international community in the near future. As space technology and its implementations evolve, other concerns, such as property rights to external space resources, will rise in relevance. It is evident that international cooperation is the key component for the continuity of peaceful exploration and use of space, but that the Space Law is splintering, a trend that arose primarily from the commercial use of space.

In order to provide a safe environment for space exploration in the sense of the legal framework that applies to it, it is important to enact and harmonize domestic space laws in response to these worries. However, domestic rules should be harmonized in light of changes to international space law. Finally, it should be understood that there is a clear need to strike a balance between the preservation of issues that are obviously safe at the moment and the need for treaties to be updated and reformed. Alternately, the absence of a consensus can cause the current system to disintegrate.

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