

Need of National Space Legislation for Space Faring Nations

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Abstract—The need for national space legislation is pivotal, particularly in light of the fact that in recent years space activities have grown immensely both in volume and diversity. Countries are progressively developing capabilities in space exploration and scientific discoveries, market their capabilities to manufacture satellites, provide launch services from their facilities and are looking to privatize and commercialize their space resources. Today, nations are also seeking to comprehend the technological and financial potential of the private sector and are considering to share their financial burdens with them and to limit their exposures to risks, but they are lagging behind in legal framework in this regard. In the perspective of these emerging developments, it is therefore, felt that national space legislation should be enacted with the goal of building and implementing a vibrant and transparent legal framework at the national level to hasten investments and to ensure growth in this capital intensive - highly yield strategic sector. This study looks at (I) the international legal framework that governs space activities; (II) motivation behind making national space laws; and (III) the need for national space legislation. The paper concludes with some recommendations with regards to the conceivable future direction for national space legislation, in particular space empowered sub-areas for countries.

Keywords—International conventions, national legislation, space faring nation, space law.

I. INTRODUCTION

AS we move in to this century, Asian countries have joined Europe and North America as vigorous participants in space. The United States, Europe and Russia, with launching facilities and extraterrestrial probes, are now joined by other nations such as China, India and Japan. China has gone much further by sending men into Earth orbit [1]. Since the commencement of this century, business interests in space have kept on developing globally, some privately owned businesses plan to become active in space as well.

Presently, the development of space activities depends essentially upon the possibility of recovering investments [2]. Private sector-driven commercial endeavors in outer space have been increasing exponentially and experienced a significant quantitative growth over the last years. Space faring nations actively promote commercial participation of private companies in operations related to outer space. Outer Space is increasingly becoming the venue for one of the fastest growing commercial activities. In 2015, the global space economy totaled \$323 billion worldwide with a total of \$246 billion,

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commercial space activities made up 76% of the global space economy [3]. The private sector is now increasingly providing services in space launch services, satellite telecommunications, as well as remote sensing and global positioning directly to its customers.

As we are progressing at a rapid pace in technology, more and more organizations will be working somewhere other than on earth such as in low earth orbits, lunar or Mars colonies, asteroids mining etc. Most of the space faring nations have already begun to investigate such conceivable outcomes. The majority of space faring countries has recently sent probes or are sending probes to the moon to map what resources exist in and what quantities. The United States at this moment has the Lunar Reconnaissance Orbiter revolving around the Moon [4]. These probes have equipment to outline and map the resources on the moon. Likewise, work is under progress for exploration and utilization of planetary resource mining such as asteroids mining. But what are the legal intricacies of such activities in outer space? Can a privately owned business or consortium set up a claim on the Moon that would secure the vital rights to benefit from planetary assets? Lamentably, these questions cannot be completely settled with the current space laws.

Presently, a growing number of States are becoming space faring nations and are in the planning stages, there is an opportunity to formulate a legal framework and ethical behaviors in this new commercial marketplace. The United Nations (UN) General Assembly has also encouraged States to "consider enacting and implementing national laws for continuing supervision of the activities of non-governmental entities in outer space under their jurisdiction".

II. INTERNATIONAL LEGAL FRAMEWORK

Beginning in 1957 with the space race, nations started discussing the frameworks to ensure the peaceful utilization of space. In 1958, bilateral talks among the United States and USSR brought the introduction of issues with the UN for discussion. In 1959, the UN made the Committee known as The Committee on the Peaceful Uses of Outer Space (COPUOS). COPUOS along these lines made two subcommittees, the Scientific and Technical Subcommittee and the Legal Subcommittee. The COPUOS Legal Subcommittee is considered as a basic forum for discussions and negotiations regarding international agreements relating to outer space. For a dozen years commencing in 1967, the world community drafted five major multilateral conventions establishing the basic principles of space law.

The first and most essential treaty "Principles Governing the Activities of States in the Exploration and Use of Outer Space,

including the Moon and Other celestial Bodies” is generally known as the Outer Space Treaty [5]. Outer Space Treaty has been ratified by more than 100 countries and it is widely accepted as the international law governing activities in outer space.

The Outer Space Treaty has laid three successive treaties: The Return of Astronauts and the Return of Objects Launched into Outer Space (The Rescue Agreement) [6]; The Convention on International Liability for Damage Caused by Space Objects (The Liability Convention) [7]; and the Convention on Registration of Objects Launched into Outer Space (The Registration Convention) [8]. These treaties have been broadly acknowledged by the global community. The names of the treaties speak evidently to their contents and intentions, managing mostly with issues of liability, risk for people and materials that have been launched into space yet not speak about the issues of land or mineral rights on celestial bodies.

The recent treaty dealing with outer space is the Agreement Governing the Activities of States on the Moon and Other Celestial Bodies (the Moon Treaty) [9]. However, the Moon Treaty has been to a great extent rejected by the international community with a view point that most of its provisions would make outer space resources the “common heritage of mankind” [10]. In spite of the fact that the Moon Treaty is a valid law, American commentators do not consider it as a part of space law having believe that it goes against its signatories [11]. Just sixteen countries have ratified the treaty and none of them space faring [12]. Certainly, no signatory of the Moon Treaty has launching capability, signifying that it does not reflect any practical concerns in space exploration and development. So this treaty can hardly be considered representing any form of international legal consensus. These five treaties cover the "non-appropriation of outer space by any one country, the freedom of exploration, liability for damage caused by space objects, arms controls, the safety and rescue of astronauts and space crafts, the notification and registration of space activities, scientific investigation, the prevention of harmful interference with space activities and the environment, the exploitation of natural resources in outer space and settlement of disputes.

The United Nations General Assembly has also adopted five declarations and legal principles that encourage unified communication between countries and exercise of international laws. These five declarations and principles include:

- The Declaration of Legal Principles Governing the Activities of States in the Exploration and Uses of Outer Space (1963) [13];
- The Principles Governing the Use by States of Artificial Earth Satellites for International Direct Television Broadcasting (1982) [14];
- The Principles Relating to Remote Sensing of the Earth from Outer Space (1986) [15];
- The Principles Relevant to the Use of Nuclear Power Sources in Outer Space (1992) [16];
- 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) [17].

Collectively, these five treaties place numerous obligations upon States. They require States to adhere to principles of international laws, assume responsibility and liability for activities in space, authorize and supervise the activities of their nationals in space, and provide notice and register of their space objects.

The authority of these UN resolutions and agreements has never been doubted. However, there had been many legal debates as to the effect of UN General Assembly resolutions and declarations. The fact that a resolution of the UN has not got the legal effect of a treaty does not mean that the principles laid down in such a resolution are therefore not legally binding. International obligations arise not only from treaties, but also as in Article 38 of the Statute to the International Court of Justice - from international custom, as evidence of general practices accepted as law [18]. All that is required for evidence that a custom exists in the international sphere is that there is a general practice accepted as law.

III. MOTIVATION OF NATIONAL SPACE LEGISLATION

The motivation for nations to establish domestic space laws embedded in the corpus of outer space treaties. It is useful to review the explicit provisions that require actions from nations that have signed and ratified the agreements. It is on the premises of well recognized principles that urge nations to set up national space legislation, not simply to fulfill obligations arising out of outer space treaties but rather on the grounds that the space activities and space industry in the country will soon emanate to a level that makes a compelling case for legislative action. Duties and obligations that have been imposed on member states in particular treaty provisions are as under:

A. Outer Space Treaty (OTS)

According to OTS, state parties to the treaty shall bear international responsibility on account of its national activities in outer space including the moon and other celestial bodies, regardless of that whether these activities are performed by public or non-public entities and assuring that these national activities are being carried out in conformation with the provisions laid down in the OTS [19]. In other words, a member state is restrained to the peaceful utilization of outer space, non-appropriation, non weaponization and international cooperation. Besides this, the State is also obligated to ensure that space activities are duly authorized and performed under its continuing supervision. OTS also impose liability for damages by making the launching State liable in the case its space object causes damage to other State party [20], [21].

B. Rescue Agreement

This agreement provides meticulous resolution to the obligations that are imposed on member states on account of the rescue of astronauts, the return of astronauts and the return of objects launched into outer space [22].

C. Liability Convention

Liability Convention 1972 augmented and expanded the liability provisions of the Outer Space Treaty. Article I of the

Convention describes the term “launching state”. Article II constitutes absolute liability for damage. According to this article, the launching State shall be absolutely liable to pay compensation for damages caused by its space object on the surface of the Earth or to aircraft in flight. Article III establishes fault-based liability for damage caused in outer space. Article IV permits liability mitigation on the basis of evidence of negligence on the part of the claimant. Article VII releases the launching State from liability in respect of foreigners and nationals of the launching State participating in the launch activity. The important point to note is that the State, and not a private entity whose space object has caused the damage, is directly held internationally liable. Therefore, a national legal framework needs to be established for private space activities conducted either in domestic territory or by its nationals regardless of where the activities take place, should be established if a state is interested in covering potential liability. Furthermore, State parties to the liability convention will need to establish laws on the liability issue related with the “nationals of the launching State and foreign nationals” at the national level.

D. Registration Convention

As indicated in Article VIII of the Outer Space Treaty, member States are required to keep a “Register” of the objects launched into outer space for the objective of identification. The article premise that “state party to the treaty on whose registry an object launched into outer space is carried shall retain jurisdiction and control over such objects and personnel in outer space or on a celestial body.” Moreover, Article IV of the convention imposes another obligation on States to provide information to the Secretary General of the United Nations regarding every space object carried on its registry. The information includes the name of launching State, registration number, territory and date of launch, location of launch, orbital parameters such as inclination, nodal period, apogee & perigee, and general function of the space object. The registration of objects launched into outer space enhances the obligation in order to facilitate the identification of the State which has the ownership, jurisdiction, and control over the space object that has caused damage as a condition precedent for imposing ‘liability’ and seeking compensation for the same. Therefore, the Registration Convention signifies the requirement for a national regulatory framework to serve as the basis for establishing a national register containing information related to space objects launched in outer space.

E. Moon Agreement

The Moon Agreement was deliberated by the Legal Subcommittee of UNCOPUOS from 1972 to 1979. The Moon Agreement was adopted by the General Assembly in 1979. The Agreement reaffirms and explains on many of the provisions of the Outer Space Treaty as applied to the Moon and other celestial bodies, giving that those bodies ought to be utilized only for peaceful purposes, that their environments ought not be disturbed, and that the United Nations should be informed of the location and purpose of any station established on those

bodies. Furthermore, the Moon Agreement provides that the Moon and its natural resources are the “common heritage of mankind” and that an international regime should be established to govern the exploitation of such resources when such exploitation is about to become feasible.

16 countries have ratified the Moon Agreement providing their intentions to accept international obligations with regards to their activities on the moon and other celestial bodies. It is significant to note that China, the European Space Agency, Russia and the U.S.A. have not endorsed this agreement. The Moon Agreement supplements the provisions of the Outer Space Treaty and specifically enables state parties the right to collect and eradicate samples of minerals and other substances from the moon and utilize them for scientific purposes, proclaim natural resources over the moon as the “common heritage of mankind” and proscribes any form of hostile acts on the moon.

It needs no emphasis that the obligations and liabilities imposed by the outer space treaties is to allow the States to claim compensation in the case of damages according to the procedures specified in these treaties.

IV. NEED FOR NATIONAL SPACE LEGISLATION

Many reasons can be enumerated to elucidate why increasing numbers of States have been enacting national space legislations. First, activities in outer space are inherently dangerous. In order to avoid harm caused by space operations, a framework to supervise and control them is desirable. Second, countries need to make sure that private subjects, while operating in space, do not violate a nation’s international obligations and undermine its national security. Third, the international legal regulations for space activities and, in particular, the Outer Space Treaty, the Registration Convention, and the Liability Convention, impose many obligations and duties on governments that cannot somehow be transferred to private organization. These obligations make it indispensable for countries to implement national space legislation.

Additionally, the necessity to correspond with international responsibilities is implicit in international treaties. Harmonization in this way represents fundamental physical connection among counties’ declared positions in the international arena on outer space and practices at the national level. In its context, integrating treaties obligations with national laws demonstrates the enduring firmness of a nation to support the imperative needs to manage international affairs in such a way to ensure that outer space does not turn out to be another battleground for nations. Moreover, according to the international laws, nations must satisfy international obligations and commitments in good faith, regardless of whether or not it adapts those obligations with its national laws [23]. Harmonizing and invoking international conventions with national laws gives a state an important rationale to legislate domestic laws in a way that is imperative with the circumstances and need of the country yet retaining the privilege to revise, repeal and execute new laws. The presage of failing control over the development and direction

of space policy is may be the most important motivation behind why space programs continue to be controlled by governments in numerous countries that have not taken initiatives to harmonize the international space law conventions, nor enact and legislate particular national space laws. This is specifically valid for developing nations in the Asian region, a couple of which are known for remarkable accomplishments and future capabilities in space development. Apart from Australia, Japan and South Korea, no other countries in the Asian region have invoked international conventions through their national space laws. This is factual for space emerging nations such as Indonesia, Pakistan and Thailand that have space applications programs without launch capability. It is also true for China and India which are considered as space powers in Asia with indigenous launch capabilities. In this context it is significant to highlight distinct characteristics of the outer space law treaties. Despite the fact that these treaties do not impose sanctions if obligations originating out of them are not prescribed and imposed in national laws, they may however be considered, by their act or omission, as breach of international law. Space treaties give consultation through the United Nation Office and diplomatic channels as the desired and preferred means to invoke liability for damage, seek compensation and to resolve disputes. However, the practice of this mechanism is restricted to the resolution of disputes and claims between parties. It does not impart itself to national application. Therefore, the lack of national legislation does not exculpate member States from the obligation to discharge the liabilities under the Liability Convention. A failure to do so, for whatever reason, would reflect a breach of space treaties and international laws.

As we perceive, the status of harmonization of space treaties and the development of national space laws by the ratifying member States yields two contrasting positions among developed and developing countries. Australia, Canada, Israel, Sweden and UK are those countries who have their own national space laws in several forms. Russia and the US, who were the first nations to explore and use outer space, have locally harmonized space treaties in very different ways. It is significant to note that Russia and the US have incorporated several principles in their national space laws that are enshrined in the Outer Space Treaty and other conventions without actually using the specific text and wordings of those treaties.

Russia has adapted international conventions into a single omnibus law which is well-matched for its further national interests such as national security, economic development and predominance in outer space. The Russian Federation Law on Space Activities 1993 is a far reaching enactment which proclaims the development of the country, well-being of the residents of Russia, ensuring its security, and taking care of the global issues of mankind as the objective and purpose of its space activities. The Act determined the principle of international responsibility regarding its actions and activities in outer space as well as some proscription recorded in the conventions ratified by Russia.

National space legislation is the outcome of national space

policies. Changes and variations in policies require corresponding modifications in respective laws. For instance, US National Space Policy has been produced over many years. It keeps on developing and evolving based on improved goals and objectives, previous policies, budget constraints, current programs, treaties obligations and national and international laws. The policies are manifest by several various specific national laws that setup the necessary legal regime accomplishing the goal of securing and furthering national interests and pre-eminence in all matters concerning the use of outer space.

V. CONCLUSION

Given the current evolution of the space arena in the context of the diversification and multiplication of actors, threats and challenges, space faring nations need to take action to provide an overall stewardship to space activities such as satellite manufacturing, launch vehicles, remote sensing, satellite navigation, telecommunications and broadcasting. These industries are constantly expanding markets in space faring countries. Similarly, space commercialization proceeds much faster than we may expect. Many new legal issues are arising and no ready and easy solution can be put forward. Therefore, there is significant need for national legislation that will extensively cover contemporary issues and fill loopholes in the international space law regime.

Space legislation should incorporate (i) legal issues associated with satellite telecommunications and broadcasting; (ii) legal issues related to satellite navigational systems; (iii) legal issues connected with remote sensing satellites, data processing and distribution; and (iv) legal issues concerned with launching activities. Furthermore, there is the need for a proper legal framework at the national level for issues related to funding for space activities, certification of space technology, licensing, liability for damage, safety of space activity, insurance, responsibility, protection of intellectual property rights consequent to space activities, protection of the environment and ecology, promotion and financial support to the development of space sciences, dispute resolution and International Cooperation.

In the unfolding new space era, space faring nations cannot afford to miss the opportunity to develop its own long-overdue national space legislation. Space faring nations without national space legislation would be lacking a key element to face the future with confidence, to improve current mechanisms for exploration and to ensure the long-term sustainability of space activities.

To conclude, it is worth noting that national space laws are an important means not only to regulate space activities to ensure the protection of a State's citizens from damage or injury, but also to limit the burden of exposure to risks, so as to foster the development of private space activities, hasten investments and to ensure growth in this capital intensive, high-yield strategic sector.

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