

The Outer Space Exploration Under International Space Law:

An Islamic Point of View

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Abstract—The success of the Soviet Union in launching the Sputnik I Satellite in 1957 marked the start of space exploration. The advancement of the outer space science and technology has made it possible and opened up considerable opportunities for states and certain parties to carry out activities in outer space. Hence, in its development, outer space activities will continue to increase. This has paved the way for the formation of space law. At present, exploration of outer space activities is dominated by developed countries which have the power of space technology. This article will discuss the exploration of outer space under international space law and some Islamic perspectives regarding outer space exploration which has been implicitly stated through several verses in the Qur'an. The results of this study would provide spirit especially for Muslims to be able to answer the challenges of Allah SWT to explore the outer space with the power of knowledge.

Keywords: *exploration, outer space, Islamic point of view*

I. INTRODUCTION

The success of the Soviet Union launched the Sputnik I satellite in 1957, which was followed by the success of Yuri Gagarin in 1961 and the success of Neil Armstrong setting foot on the moon in 1969, paving the way for exploration in outer space [1]. Outer space activities are likely to continue to increase along with advances in science and technology that continues to increase. Therefore, the existence of laws that regulate human activities in outer space becomes a necessity. Some scholars provide several definitions of space law, such as Manfred Lachs, which in essence describe that space law is "a set of rules and principles governing the legal relations and activities carried out by humans and or other legal subjects in outer space or aimed at outer space" [2].

Outer space activities were initially very oriented towards military and defense purposes. This is reinforced by the world political situation that is in a cold war between the United States and the Soviet Union, two countries that are very dominant in the development and utilization of space technology. After the cold war, the involvement of the private sector in outer space activities became more intensive and widespread because the focus of outer space activities had shifted from the military to commercial.

The involvement of the private sector in outer space activities began to take place since 1980 when space technology had begun to be used for commercial purposes, especially in the field of telecommunications [3]. Since this time, the terminology of space commerce or commercialization of outer space has not only become a new term, but has also become a new trend in such activities. In short, human activities in outer space can be classified into activities that are public and private. Public activities consist of research activities carried out by the state and defense activities carried out by the military. Activities that are private include activities related to telecommunications operations, remote sensing, live broadcasting via satellite, space airports, space transportation systems, and space tourism [4]. Hence, human activity in outer space will continue to increase along with the development of space technology. Therefore, it is timely significant to establish laws that regulate human activities in outer space as the activities of outer space could raise legal problems ranging from the delimitation issue of air space and outer space to the problem of responsibility related to outer space activities. Until now there has been a set of international legal instruments govern activities in outer space, known as *corpus juris spatialis*. This article will discuss the exploration of outer space under international space law provided by *corpus juris spatialis* and some Islamic perspectives on the existence of outer space and outer space activities.

II. METHODS

This study used normative juridical method which analysing existing legal framework in outer space activities and some Islamic point of view. While the primary legal materials consist of all the international treaties governing outer space activities (*Corpus Juris Spatialis*) both directly and indirectly, secondary ones included the references, including books, journal articles as well as conference papers and other documents having correlation with the issues. The technique of analysis data used legal interpretation. Specifically, the international agreements as primary legal materials include: 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) and

Convention on International Liability for Damage Caused by Space Objects, 1972 (the Liability Convention).

III. RESULTS AND DISCUSSION

A. Legal Problems Arising from Outer Space Activities

1) *Delimitation between air space and outer space*: The problem of determining the boundary line between air space and outer space (delimitation) is still a field of debate between countries, the United Nations (UN), and law scholars. This can be seen from the many theories reveals to establish the delimitation. Up to 1977 no less than 27 proposals had been submitted to the legal sub-committee of the United Nations Committee on Peaceful Uses of Outer Space (UNCOPUOS). Such theories can be grouped by categories as follows [5]:

a) *Category I*: Delimitation based on scientific criteria and technology. Included in this category include: The aeronautical ceiling theory, which is a theory that bases the highest limit of air space and the lowest limit of space to the maximum height of an aircraft that can fly (about 80 km from the surface of the earth) and the minimum height to do space activities (120 km from the surface of the earth). This theory stipulates that the boundary between air space and space will be between the boundaries of the two, which is located around an altitude of 100 km from the earth's surface. Furthermore, Von Karman's Theory,[6] which sets the highest limit of air space to the aerodynamic characteristics of aircraft and several other theories based on the lowest point of a satellite orbit (perigee), which is about 160 km from the surface of the earth and the theory of delimitation based on the influence of gravity earth.

b) *Category II*: Delimitation based on conventional designation. Determination of the highest limits of air space and the lowest limits of space based on this category is not based on scientific and technological approaches. Several delegates at UNCOPUOS agreed to a proposal submitted by the Soviet Union that set a limit of delimitation at an altitude of 100-120 km above sea level without conducting scientific studies.

c) *Category III*: Delimitation with a functional approach. According to this category, functionally there is no need to set a boundary line between air space and space because space is a continuation of air space with a gradual transition.

Actually, all the categorized theories have not been able to resolve the problem of spatial delimitation satisfactorily as the problem question based on the fact that we have two opposite theories and two opposite regimes relating to the sovereignty and jurisdiction of space above their territory. There are opposed position reflected in treaties, i.e. a position that every state has complete and exclusive sovereignty in airspace. This is the principle which we are still operating today in international law as well as in international relations. Then, there is the reality also that the Common Heritage of Mankind principle governs the jurisdiction of state in Outer Space as

stipulated in Article I of the Outer Space Treaty of 1967 that the Outer Space shall be the province of all mankind.

2) *Applying the principle of responsibility in outer space activities*: As the outer space activity is an activity that has a high risk, the space law then specifically regulates the state's responsibility for damages arising from outer space activities in the Outer Space Treaty of 1967 and the Liability Convention of 1972 [7]. Particularly, both of these space law instruments stipulate that the launching state will responsible for damages caused by outer space activities. Article VII of the Outer Space Treaty of 1967 stipulates that "...each state party to the Treaty that launches or procures the launching of an object into outer space Is internationally liable for damage to another state party" [8]. The Liability Convention of 1972 further elaborates launching state as a state which launches or procures the launching of a space object, or a state from whose territory or facility a space object is launched [9].

The definition of launching state provided by the two legal instruments emphasizes that every state parties should be responsible for their outer space activities. Determining launching state as the party that should be responsible is the right provision as state is an entity whose more stable existence and legal position compared to other entities. Moreover, in the frame of the interests of victims, the state's position as the responsible party would provide legal certainty. Hence, it will be easier in terms of proof given because the launch of space objects is generally carried out in the territorial or legal territory of a state [10].

Problems arise when outer space activities are carried out by non-state entities as the development of commercial space activities is mostly carried out by the private sector. Should the state be responsible for these activities? For those whose minor interpretation, the notion of 'launching state' does not cover launches carried out by non-state entities. So that responsibility cannot be held to the state. The Outer Space Treaty of 1967 does not follow this interpretation. Article VI of the Outer Space Treaty of 1967 defines 'launching state' by including the space activities carried out by a non-state entity on the authorization or permission of the state as the outer space activities carried out in that state. The authorization is the legal basis for the establishment of state responsibility as a 'launching state'. The existence of this authorization causes non-state entities within the framework of Article VI the Outer Space Treaty of 1967 to be qualified as national activities and the state is responsible for its national space activities. Article VI of the Outer Space Treaty of 1967 set as follows [11]:

"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 set forth in the present Treaty. The activities of non-governmental entities in outer space, including the Moon and other celestial bodies, shall require authorization and continuing supervision by the appropriate State Party to the Treaty..."

Whenever two or more States jointly launch a space object, under the Liability Convention of 1972, they shall be jointly and severally liable for any damage caused. In this case, the burden of compensation for the damage shall be apportioned between the first two States in accordance with the extent to which they were at fault. If the extent of the fault of each of these States cannot be established, the burden of compensation shall be apportioned equally between them. Such apportionment shall be without prejudice to the right of the third State to seek the entire compensation due under this Convention from any or all of the launching States which are jointly and severally liable [12].

B. Islamic Perspective on the Existence of the Space and Spiritual Activities

1) *The existence of the outer space in the Qur'an:* Many verses of the Qur'an explain the creation of the heavens and the earth, from which these evidences can be proved by the existence of outer space. Allah Almighty created the earth for mankind to use, together with the creation of the earth. All are full of benefits. God created seven layers of celestial bodies, among which the heavens are visible to man and some invisible, according to the word of Allah Almighty [13]:

سَمُوَاتٍ سَبْعَ فَسُوَاتُهُنَّ لَسَمَاءٌ إِلَى سَتْوَىٰ أَمْ تَمَّ جَمِيعًا لَأَرْضًا فِي مَّا لَكُمْ خَلْقٌ لَذِيًّا هُوَ
٢٩ عَلَيْهِ شَيْءٌ بِكُلِّ وَهُوَ

Meaning: "He is Allah, who created everything on earth for you, and He is creating the heavens, and made them seven heavens. And He is All-Knowing"

The creation of the earth with all its benefits is clearly intended for human benefit, Allah Almighty provides the earthly facility for man to be a caliph, capable of carrying out his duties to the fullest. The advances in science and technology have encouraged humans not only to utilize the facilities provided by God on earth, but also to encourage humans to take advantage of what is in heaven (air space) and outer space.

Then, Allah Almighty challenges the spirits and the human beings to penetrate the corners of heaven and earth. Implicitly God provides the challenge to explore space through the power of knowledge, God explained in the Surah Ar-Rahman verse 33 [14]:

لَا تَقْدُوا لَأَرْضًا أَوْ لَسَمُوَاتٍ أَقْطَارَ مِمَّنْ تَقْدُوا أَنْ مَسْتَطَعْتُمْ إِنْ لَأِنْسٍ أَوْ لَجِنِّ مَعْتَرٍ
٣٣ بِسُلْطَنٍ إِلَّا تَقْدُونَ

Meaning: "To all jinn and human being, if you are able to penetrate (cross) the corners of the heavens and the earth, and thus, you cannot penetrate it except by force"

The success of the experiment in space transportation actually is so small and so limited in comparison to the greatness of the universe that it requires extraordinary effort in science with all its branches: engineering, mathematics, art, geology, and so on. Not to mention the huge expense. This clearly shows that the attempt to penetrate the sky and the earth for millions of years of light is impossible for the spirits and the human beings.

Space exploration has become an indispensable factor in the digital age, as many digital facilities are closely linked to space utilization, such as the use of satellites for telecommunications, navigation, meteorological, research, and military needs. The Messenger of Allah (may peace be upon him) in one of his hadiths says. "You know more about your world." Therefore, it is understandable that the exploration of heaven and earth for human benefit is not prohibited in Islam, but is strongly recommended.

2) *Review of Islamic law on the exploration of the space:* God Almighty as the creator of the universe including one of humanity, is more aware of human needs. He knows everything that can bring happiness to mankind. Therefore, Allah Almighty establishes His Command, which are then called Islamic Laws in order to achieve prosperity and prevent harm [15].

The Islamic Law contained in the Qur'an and the Hadith has a purpose, at least three purposes of Islamic Law, which can be seen in terms of its level of interest to mankind, as follows [16]:

a) *The primary purpose:* of Islamic law is to maintain the sustainability of human life. If the goal is not achieved, it will cause a great loss of human life in the world and in the hereafter, or could damage the life itself. This basic necessity of life can only be achieved by the maintenance of the five purposes of Islamic law, such as: a) Preserving religion; b) protect the soul; c) preserving the mind; d) nurturing posterity; and e) the preservation of property.

b) *The secondary purpose:* of Islamic law is to maintain the purpose of human life which consists of the various secondary needs of human life. Such secondary needs, when not fulfilled or maintained, can result in difficult conditions for human life. However, such complexity will not destroy human life in general. The purpose of the Islamic Law in worship for example can be achieved by the existence of law rukhsah, like the purity in carrying out a form of worship in the form of a dispensation to defame and recite prayers for people traveling.

c) *The tertiary purpose:* of Islamic law is the aim of perfecting human life by doing what is good and most morally appropriate and avoiding things that are despicable.

Judging from the purpose of Islamic law above, it can be concluded that the exploration of outer space is part of the purpose of Islamic Law, as exploration and utilization of outer space can enhance human life, facilitate, and provide benefits to mankind.

Imam Ghazali defines mashlahah (benefits) by taking advantage and avoiding harm. The problem is at least twofold:

- Creating the benefits, benefits and pleasures of human beings commonly known as bringing benefits. Such goodness and pleasure are experienced immediately by those who do what they are told to do. It is like a thirsty person drinking a refreshing drink. There were some that he felt later on, but at the time of his execution he did not feel it as a pleasure but in vain.

- Avoiding humanity from so-called damages and badness. Sometime, damage and the badness could be felt immediately after doing the forbidden act. In other time, there were whiles to be felt.

Benefits is the purpose that the Shari'a wants to create. The Benefits is the essence of Shariah policies (Syas` syar`iyyah) in responding to social, political, and economic dynamics. The concept of mashlahah as one of the approach methods in Islamic jurisprudence became indispensable to the development of the age, especially in the field of technology. Thus, the development of science and technology, especially technology used in outer space exploration, should be based on the concept of Benefits as Benefits is the essence of Islamic Law.

IV. CONCLUSION

The outer space activities have been regulated in the international space law provided by *corpus juris spatialis* as such activities have a high risk and in practice, it could raise some legal problems. Such legal instruments already have some detailed elaboration of regulations and mechanisms to anticipate damages arising from outer space activities. From Islamic Law point of view, the creation of the outer space (read: heavens) by God Almighty has intended for human benefits. Therefore, the advances in science and technology should have encouraged humans to take advantage of what is in outer space (outer space exploration). The development of science and technology, used in outer space exploration, then should be based on the concept of benefits as benefits is the essence of Islamic Law.

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