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Outer Space: is it a global common?

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This review examines critical questions related to whether the outer space is a global common; it also addresses the challenge of achieving balance between the outer space treaty (OST) mandate of compliance with the common interest principle and requirement of providing an environment for the success of commercial lunar enterprises while simultaneously mitigating the possibility of conflict on the Moon.

KEYWORDS

Global Commons, common interest principle, outer space treaty (OST), Moon, Common Heritage of Mankind, resources, Artemis Accords, International Lunar Research Station

1 Introduction

The United Nations has identified four *global commons*, namely the high seas, atmosphere (air space over the high seas), antarctica, and outer space ([Global Governance, 2015](#)). The explicit rejection of outer space as a global common, per the United States Executive Order of 2020, at a time when the idea of off-Earth activities aimed at commercial utilization of planetary resources was gathering momentum has generated intense discussion and debate. Many have argued in support of the official view, while others have opposed it emphatically, apprehensive that it threatens the internationally settled practice on the freedom of States to undertake activities on the exploration and use of outer space, including the Moon and other celestial bodies. Scholars and jurists emphasize that the outer space is and must continue to be viewed as a global common; they are concerned that rejecting such a construct may lead to adverse implications for developing countries for undertaking activities in outer space in conformity with the *common interest principle* under Article I of the Outer Space Treaty (OST) of 1967 ([Unoosa, 1967](#)).

This article explores four pertinent questions that are raised by the rejection of outer space as a global common: (1) What is a global common? (2) Is outer space a global common? (3) How does outer space as a global common influence the exploration and use of space? (4) Does the OST require space to be a global common or could the benefits and interests of all countries be achieved in other ways? The article also presents some concluding remarks.

2 What is a global common?

Global common refers to international, supranational, and global resource domains containing common-pool resources that lie beyond national jurisdictions. However, in the absence of an authoritative definition, varied interpretations of the term global common have led to inconsistent application or rendered the intended meaning unclear.

2.1 Global common and sovereignty

The term global common is better understood by examining its applicability in the context of the concept of sovereignty. In historical terms, the idea originated in the British Isles in reference to the *common lands* of villages or towns, where the communities had common rights over resources, such as grazing grounds; this idea was later used in reference to the Enclosure Movement (Community Environmental Legal Defence Fund, 2022). The *common* is built upon the legacy of *mare liberum* or “free sea,” a concept that was first formulated by Hugo Grotius in 1609 in his eponymous treatise *Mare Liberum* (Grotius, 2004), which played a foundational role in establishing the principle that some planetary spaces should preserve the freedom of access and benefits of all. In 1968, Garrette Hardin provided its intellectual construct in his pioneering essay *Tragedy of the Commons* (Hardin, 2018), in which he applied the rational choice theory and argued that individual actors automatically tend to overexploit and plunder the common-pool resources that are freely available to everyone; accordingly, the only possible solution was “the enclosure of resources through private property or failing that, public regulation” (Cogolati et al., 2018). Later, Elinor Ostrom provided a new perspective in her 2009 Nobel-prize-winning work on the analysis of governing common-pool resources (Ostrom, 2015), which has been regarded by some to have influenced the construct of a global common.

2.2 Global common: two perspectives

Global common can be viewed from two perspectives: first, the global common can be viewed as an enabling concept from the perspective rooted in geopolitical or military relevance; second, the global common can be viewed as a constraining concept from the perspective of economic and commercial implications of the shared resources, which could be overused by some at the expense of others, regardless of national jurisdiction. The global common may also be viewed from the perspective of national interest as well as from an international perspective related to its governance and protection.

3 Is outer space a global common?

A global common is understood to be a supranational domain outside national jurisdiction that contains a common pool of resources for all.

3.1 Where is the outer space domain located?

The term global common is not mentioned in the OST. Outer space, including the Moon and other celestial bodies, is the domain located beyond approximately 100 km above the Earth’s surface, which is accepted as the unofficial boundary between outer space and air space. Outer space also includes its natural resources.

3.2 Natural resources

There are two categories of natural resources in space: those that are recognized as *limited natural resources* in the Earth orbit, particularly the geosynchronous orbit/orbital slots and spectrum radio frequencies (RFs) that are regulated by the International Telecommunications Union (ITU)¹ and radio regulations (ITU, 2023); planetary resources that are *limited non-renewable natural resources* and governed under the Moon Agreement of 1979 (Moon Agreement, 1979).

3.3 Supranational domain: Article II

The foundational legal attribute of outer space precludes the application of state sovereignty in outer space as well as categorically and unambiguously denies any and all claims of sovereignty, especially the application of traditional sovereignty to outer space and celestial bodies (Christol, 1982). Specifically, Article II of the OST states that *outer space, including the Moon and other celestial bodies, is not subject to national appropriation by claim of sovereignty, by means of use or occupation, or by any other means*. The term *appropriation* here means exercising exclusive control or exclusive use and denial of access and the use of outer space to others. Legal commentators, including Judge Lachs, the then Chairman of the Legal Subcommittee of the COPOUS, have reiterated that [prohibition on] *national appropriation* in Article II included both “sovereign rights and private property rights” (Jakhu, 2006; Goedhuis, 1970). In effect, Article II implies that outer space cannot be appropriated to serve the exclusive interests of any state. Outer space is established as a supra national area domain beyond national territorial sovereignty (Jakhu and Freeland, 2022).

3.4 Common pool of resources for all: Article I

Article I (often referred to as the “common interest principle”) states that *the exploration and use of outer space, including the Moon and other celestial bodies, shall be carried out for the benefit of and in the interest of all countries irrespective of their degree of economic and scientific development and shall be the province of mankind; that*

1 ITU (2023). International Telecommunications Union regulates access to orbits and frequencies under Article 44, Para 2 (CS 196) of the Constitution of the ITU and reiterated in No.03 of the Radio Regulations, which state, inter alia, . . . to ensure equitable access to orbits and frequencies, taking into account the special needs of the developing countries . . . ITU has representatives of the government and the private sector which coordinate global telecommunications networks, including services and satellite spectrum cited in Joanne Wheeler in the International Telecommunications Union Access to Spectrum, the Space Law Review, UK. Available at: <https://thelawreviews.co.uk/title/the-space-law-review/international-telecommunication-union-and-access-to-spectrum#:~:text=The%20role%20of%20the%20ITU,0.3%20of%20the%20Radio%20Regulations.>

outer space shall be free for exploration and use by all States without discrimination of any kind, on the basis of equality and in accordance with international law; that there shall be free access to all areas of the celestial bodies; that there shall be freedom of scientific exploration in outer space, including the Moon and other celestial bodies; and that States shall facilitate and encourage international cooperation in such investigation (Jakhu, 2006).

The inclusion of the common interest principle in the operative part of the treaty instead of its retention merely in the preamble of the treaty was because Brazil initiated such a proposal, which had the distinction of being accepted unanimously, including by the United States and Soviet Union (Jakhu, 2006). The Brazilian initiative ensured that *the inclusive interests of the international community were placed over the exclusive claims of individual states*, thereby ensuring that the common pool of space resources would be for all.

4 How does outer space as a global common influence the exploration and use of space?

The exploration and use of outer space as a global common is influenced by the intrinsically interdependent and interlinked provisions of the OST². The continued success of the OST is made possible by continuous state practice by the States to undertake the exploration and use of space for peaceful purposes in conformity with the OST. No incidents have occurred involving any state undertaking aggressive activities in outer space against any other state.

2 Outer Space Treaty (1967) Outer Space Treaty: states are required (i) States are required to undertake space activities in accordance with international law, including the Charter of the United Nations (UN Charter) in the interest of maintaining international peace and security and promoting international co-operation and mutual understanding (Article III); (ii) prohibition on weaponization of Earth orbit and prohibition on the militarization of the Moon and other celestial bodies (Article IV); (iii) to treat astronauts as envoy of mankind and render them all possible assistance in event of accident, emergency and distress, to return the astronauts safely and promptly to the State of registry of their space vehicle (Article V); (iv) to bear international responsibility for authorization and continuing supervision of space activities undertaken by their non-government entities (NGE/commercial companies) to assure that national space activities are undertaken in conformity with the Treaty (Article VI); (v) to be internationally liable for damage caused by its space object (state and commercial) in outer space, in air space and on the Earth (Article VII); (vi) to ensure the registration of its space objects (Article VIII); (vii) to undertake activities with due regard to the corresponding interest of all other states, to avoid harmful interference in activities of other states and seek prior consultation if the proposed activity may be harmful and avoid contamination of Earth orbit (Article IX); (viii) to afford opportunities to observe flight of space objects launched by them (Article X); (ix) to inform the Secretary General of the United Nations as well as the public of the nature, conduct, locations, and results of their space activities (Article XI); and (x) to provide access to stations, installations, equipment and space vehicles on the Moon and celestial bodies (Article XII).

Today, outer space is a democratized domain that is accessed by over eighty countries, although there are only eleven space-faring states (including the European Space Agency). Typically, States use “space” for strengthening their national security and defense architectures, governance, inclusive socioeconomic developments, and commercial purposes. The success of creating a balance between the common interest mandate and commercial enterprise enabling is demonstrated by the fact that the global satellite communication market is estimated at \$61.06 billion in 2023 (Globe Newswire, 2023), the global market for geospatial analytics is estimated at USD 78.5 billion in 2023 (Glob, 2023).

5 Does the OST require space to be a global common or could the benefit and interest of all countries be achieved in other ways?

5.1 Outer Space Treaty 1967

The OST does not refer to the term global common. The treaty, which has been ratified by 114 States, inherently establishes that outer space, including the Moon and celestial bodies, is a supranational domain containing a common pool of resources that are available for exploration and use by States subject to such activities being carried out for the benefit and interest of all countries (Outer Space, 1967). However, the treaty does not regulate space resources that include Earth orbits, spectrum RFs and planetary resources. The space activities of the 20th century have mainly focused on the Earth orbit and included deep-space as well as lunar missions. These space activities have utilized Earth orbits and spectrum RF resources that are regulated by the ITU. In the 21st century, space activities have been driven by technological advancements and expanded beyond the Earth orbit in the quest for exploration and commercial exploitation of planetary resources.

5.2 Moon Agreement 1979

The Moon Agreement (Moon Agreement, 1979b) regulates all aspects of planetary activities, including the utilization, exploitation, and management of planetary resources. However, the agreement is deemed unfavorable for commercial enterprises because it contains the *Common Heritage of Mankind* (Moon Agreement, 1979a) principle that prohibits rights of ownership in lunar resources (Moon Agreement, 1979c), except on the condition of equitable sharing with all state parties the benefits from commercial exploitation of lunar resources under an international resource governance mechanism (Moon Agreement, 1979d). The Moon Agreement has been ratified by 17 States; although it constitutes an international law, its applicability is limited only to the ratifying states.

5.3 Artemis Accords 2020

The United States Executive Order of April 2020 rejected outer space as a global common and deemed that the Moon Agreement of

1979 was not relevant. Pursuant thereto, the US-led lunar program articulated a set of practical guidelines and principles for undertaking recovery and utilization of lunar resources, as set out in the Artemis accords (AA) document (Artemis, 2020). The AA represents a non-binding bilateral cooperation arrangement between the National Aeronautics and Space Administration (NASA) and each of the 40 participating signatory states. The AA categorically states that *the extraction of space resources does not inherently constitute appropriation under Article II of the Outer Space Treaty*. Arguably, therefore, the proposed recovery and utilization of lunar resources is derived from this term in the OST Article I(2) *inter alia* that outer space, including the Moon and celestial bodies, shall be free for exploration and use by all States. This position has been confirmed by the United States in its initial submission to the Committee on Peaceful Use of Outer Space (COPOUS) working group (COPOUS, 2023). However, the AA document and submission are silent on the common interest or benefit sharing principle, as stated in the OST Article I(1). The concerns remain moot around these omissions.

5.4 International Lunar Research Station (ILRS) 2021

The China–Russia ILRS (ILRS, 2022) proposed to establish a lunar base near the lunar south pole by 2030 as well as a complex research facility for studying the lunar surface, reconnaissance, construction, and *in situ* utilization of space resources. As per international law, 11 states and several organizations, institutes, universities, and commercial entities have signed a memorandum of understanding (MOU) with the China Space Administration (CNSA) for cooperation in the field of innovation for exploration and peaceful use of outer space under the ILRS. However, in the absence of details regarding the proposed mechanisms of utilization and exploitation of lunar resources, it is unclear if the benefits sharing principle would be explicitly included (Submissions, 2024).

5.5 Challenges

The main challenge here is to find a way to assure that the benefits and interests of all countries are included as an inherent part of any future regulatory framework; this should be applicable to new-generation space activities involving planetary resource exploration, exploitation, and utilization in multilateral lunar projects led by advanced space powers at the time of increasing militarization in outer space and geopolitics of power contestations.

It is instructive to recall the utilization of natural space resources, Earth orbits, and spectrum RFs that facilitated the space age. We recall that the benefits and interests of all nations, as postulated in the OST, is at the heart of the Broadcasting Principles of 1983 (Broadcasting Principles, 1982) that enabled the use of artificial Earth satellites for international direct television broadcasting (DTH). The global market size of DTH is estimated to be \$134.06 billion in 2024 (The Business Research, 2024). The same is true of the Remote Sensing Principles of 1986 (Remote Sensing, 1986) that have yielded a global market size for the satellite-based Earth observation services valued at \$6.68 billion as of 2024 (The

Business Research, 2022). Today, outer space is a democratized domain that is accessed by over 80 countries depending on space-based satellite services for almost all aspects of national and personal lives.

5.6 The way ahead

Notwithstanding the aforesaid, it is argued that assuring the benefits and interests of all countries would be possible if a new governance framework for space activities involving exploration, exploitation, and utilization of space resources is adopted by COPOUS and then by the United Nations General Assembly (UNGA), possibly by way of a new treaty for that purpose. It is suggested that the proposed way ahead would have a better chance of success if the states would similarly agree to and adopt a proposal to establish a new institutional mechanism for implementing and administering the new governance framework.

5.7 COPOUS working group on legal aspects of space resource activities

In a significant development, the COPOUS established the working group (WG) on legal aspects of space resource activities in 2021. The WG is working on a 5-year plan up to 2027; to this end, the WG will consider the existing legal and normative frameworks for such activities, particularly the OST and other applicable UN treaties, along with other relevant instruments. This work may include the development of potential models, rules, and norms for activities in the exploration, exploitation, and utilization of space resources, including those with respect to related activities and benefit sharing (COPOUS WG, 2021). The WG will also ascertain the views on potential legal models for activities in the exploration, exploitation, and utilization of space resources, including those with respect to scientific and technological developments as well as best practices, to ensure that the activities are carried out in a safe, sustainable, and peaceful manner in accordance with international laws; these are expected to be adopted by the COPOUS and possibly the UNGA as a dedicated resolution.

5.8 New institutional mechanism?

It has been argued that it would be of cardinal importance to adopt an agreement on implementation of the new legal governance framework by the COPOUS for space resource activities involving planetary resources. This is critical for ensuring safe and orderly development of this new vertical of space activities, particularly since no state has previous experience in such activities. The closest example of such an institution that may be considered is the International Seabed Authority (ISA) (International Seabed, 2022), which is an intergovernmental organization that regulates deep-seabed mining, among other important aspects such as protection of the marine environment. Two other institutions that may be considered are the ITU and International Civil Aviation Organization (ICAO) (ICAO, 2021), both of which are

successful regulators of technically complex activities. Both institutions have 193 member states that cooperate for mutual benefits.

6 Conclusion

The moot question here is whether the states will ensure consensus in the COPOUS and UNGA for adopting the new legal governance framework's models, rules, and norms for activities related to exploration, exploitation, and utilization of space resources and agree upon implementation through institutional mechanisms. In conclusion, success is important for continuing peaceful use of outer space, and the future of the OST itself may depend on this outcome.

Author contributions

RK: Conceptualization, Formal analysis, Writing—original draft, Writing—review and editing.

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