

PROPERTY RIGHTS IN OUTER SPACE: PERSPECTIVES AND INSIGHTS

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Abstract

During the last decade until now, the character of space activities has fundamentally changed from public purposes to commercial ones. In light of the fact that space activities have a significant impact upon the welfare of humanity and society, it is necessary that there exists clarity in usage of outer space to be able to have the most beneficial impacts on the society.

This paper assesses the legal regime for the protection of technology use and new inventions in an outer space. Taking into consideration the inventions in relevance to outer space activities, one can argue that space-related inventions can be made and can be used, either on earth or in an outer space. The fact that the property laws are developed in strong associations with territorial and sovereignty of state, whereas an outer space is outside any of such state's territory, is one of the several critical issues that this paper seeks to achieve clarity on.

The current corpus juris spatialis is vague and riddled with inconsistencies as regards the issue of establishing a concrete regime of property rights on moon and other celestial bodies or parts thereof. Hence, the paper seeks to delve into a thorough analysis and interpretation of the governing regime in the contentious arena, whereby I shall elucidate upon the gaps left and the consequent imparting of a nebulous character. Concerning the Moon Treaty, it introduces the much lauded and maligned concept of the "common heritage of mankind" to the considerations of space property law. Therefore, I would contend that the common heritage principle must be defined in light of the Third LOS Convention. I shall further seek to put forth cogent economic arguments, favouring a regime of private property rights in outer space, evidently reflecting the essential basis of all human behaviour, which has been historically (though non-euphemistically) called the "Tragedy of the Commons." Besides, the international regulatory regime presently does contain some provisions which are invaluable to private exploitation of lunar minerals. Emphasis shall be laid on kinds of moratoria, if any, feared by the developed countries: a legal restriction against mineral exploitation and a de facto restriction which results from the ambiguity of the current treaties. Finally, I shall suggest alternative models of working out an efficient as well as equitable Property Rights Regime in outer space, which would take into account the interests of both the developed and the developing world at the same time. Moreover, a more concrete and consistent legal framework needs to be established so as to promote commercialization that has changed the very approach towards space activities, including prospects of extraterrestrial mining, space tourism and habitation.

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Introduction

The international environment for space activity has undergone a sea change in the past two decades or so. Originally started for reconnaissance during the Cold War period, space activities have now percolated to just about every other welfare activity. Needless to say, the processes of commercialization and privatization have followed and altered the very course of such activities.

Corpus Juris Spatialis has always regarded that the outer space cannot be appropriated by any State for its own purpose, the research and exploration must be carried out for the benefit of mankind and not for any selfish needs of the State. The two treaties on Outer Space also state that "outer space is the province of all mankind" and that it shall be "developed for the benefit of all mankind." The Moon Treaty of 1979 states that the Moon is the "common heritage of all mankind", which suggests that the treaty read in its literal sense negates the establishment of private property rights on the Moon and the Space. On the other hand, the advocates for the private property in space point out the Deep Sea Bed analogy to further their cause. There are a host of jurisprudential arguments which strongly favour the establishment of a private property rights regime on the moon.

Another very strong argument in favour of the private property rights regime is the environmental concern that of preserving the earth by looking at an alternative reserve of resources.

The paper seeks to carve an argument in favour of the regime of private property rights in outer space, evidently reflecting the essential basis of all human behaviour, which has been historically (though non-euphemistically) called the "*Tragedy of the Commons*." The international regulatory regime presently does contain some provisions which are invaluable to private exploitation of lunar minerals. Thus, the aim of the paper is to work out an efficient as well as equitable *Property Rights Regime* in outer space, which would take into account the interests of both the developed and the developing world at the same time.

Moreover, it shall advocate a more concrete and consistent legal framework that needs to be established so as to promote commercialization that has changed the very approach towards space activities, including prospects of extraterrestrial mining, space tourism and habitation.

It is well-established that exploitation of the moon is extremely profitable and commercial enterprise values the moon for its mineral resources and their uses. The minerals found in abundance on the moon can be used in their natural form or refined into structural, thermal, and electrical materials. Moreover, while the private enterprise receives the possible financial benefit from the risky undertaking, people throughout the world stand to benefit because space resources will conserve the Earth's scarce natural resources, further scientific discovery, and boost the world economy.

Legal Framework For Outer Space

Though the Outer Space Treaty (hereinafter referred to as 'OST') prohibits appropriation of celestial bodies, it does allow space faring nations to have a degree of certainty with respect to ownership of objects launched into space and material harvested from space. However, the Moon Treaty has introduced unacceptable ambiguities to the space property rights framework.

Any company planning to mine lunar minerals will require enormous amounts of capital from investors. Before making the massive capital investments needed to exploit the moon, private investors will insist on three conditions. First, they need the potential to earn profits. Second, in such a technology-based industry, they need to make an attractive return on their research and development investment. Finally, and most crucially they require a stable legal environment.

Not delving into the economics of the first two points / conditions, it is indeed incumbent on our part to analyze the third condition, and elaborate on it in greater detail. The legal environment concerning lunar mining, though, is presently unstable because the two major aspects, namely, the retention of profits and the prevention of technology transfer, remain unresolved. This instability has undoubtedly hindered investment in lunar mining and is preventing any commercial exploitation of lunar minerals. Currently, the Agreement Governing the Activities of States on the Moon and Other Celestial Bodies ("Moon Treaty") controls exploitation of lunar minerals. This treaty declares the mineral resources of the moon the "common heritage of mankind" (hereinafter referred to as "CHM"). The ambiguity and ramifications of this phrase have left space law one of the most unstable areas of international law. As more nations and commercial enterprises prepare to embark on space ventures, the need for certainty in international space property rights law becomes increasingly critical.

Common Heritage Of Mankind: Conflict Between The Developing And Developed Worlds

Embarking on a critical conceptualization of the notion, we have two distinct interpretations of the CHM principle which exist: *the view of the developing nations and the view of the developed nations*.

According to a restricted interpretation forwarded by the developing nations, under the CHM principle, no one legally owns international areas designated as part of the "common heritage of mankind," though theoretically everyone manages the areas. National sovereignty does not exist, nor its attendant legal attributes and consequences. Under a CHM regime, no state or group of states could legally own any part of an international area. The international community, through appropriate treaties or norms of international law, would administer the area. The primary consideration for an individual state is access to the CHM area, not ownership.

Generally, expressions of territorial sovereignty by states (national appropriation of territory) are precluded in the administration of any CHM area. Characterizing "mankind" as steward of any area creates a legal regime which pays due regard to the interests of future generations, while ensuring fair present use. Environmental goals like protection and conservation operate not only as moral guides, but acquire the force of law. Implementation of the CHM principle includes creation of income-sharing schemes among states, or establishment of multilateral controls for redistributing technologies and wealth among states. Though there is no single, universally accepted definition of CHM areas, most authorities would probably agree on these five elements:

1. *The CHM area is not subject to appropriation;*
2. *All states share in the area's resource management;*
3. *States must share the benefits derived from exploitation of area resources;*
4. *The CHM area must be dedicated to peaceful purposes exclusively; and,*
5. *The CHM area must be preserved for posterity.*

On the other hand, developing nations, theoretically and practically favor broad application of CHM, regarding it as a key "*instrument for the radical revision of existing legal regimes governing the activities of states in the use of areas and resources beyond the limits of national jurisdiction.*" Accordingly, CHM gives collective humanity property rights analogous to ownership, implicitly rejecting freedom of access to areas and their resources.

These antithetical approaches to areas outside unilateral jurisdiction create difficulties in forming a common ground of understanding upon which to implement the CHM principle. Complete adoption of either approach engenders inequities and contravenes express provisions of international law. Obviously therefore, the interpretation of the OST and the Moon Treaty is rendered quite ambiguous and nebulous.

Harmonising Conflicts

At this juncture, it becomes incumbent on our part to resolve the impasse between the developed nations and the developing nations, by a principled rejection of the developing states' "*common property*" theory and their strident claims for benefits from resource exploitation.

Use of proprietary language by the developing nations at this stage complicates matters and leads to semantic disputes. The expectation that developing nations should reap a disproportionate measure of benefits from the developed nations' outer space exploitation activities is unreasonable, even if only based upon the capital necessary for unilateral space travel and the safety risks involved.^{xvii} Rejection of the developing nations' "*common property*" interpretation of the CHM principle does not mandate acceptance of the developed nations' theory, which is also flawed.

It is unlikely the developed nations, once they obtain resources at high risk and cost, would "equitably" distribute space resources "for the benefit and in the interests of all countries." The instability of space law is a symptom of a broader problem--the current distribution of power in international politics. The developed nations, those which possess the technology and private industry to exploit the moon, are severely outnumbered (and outvoted) by the developing countries, who insist upon a sharing of profits and technology anathema to private investment. As a result, the developing countries have kept all countries from reaching the moon and let a valuable source of alternative energy lie unused. Since using these minerals is in the best interest of all the nations of the world, they ought to be retrieved and for doing so, we inevitably require private entrepreneurs, who require legal stability. Thus, a binding system of law must be devised to provide incentives for commercial ventures to act and to satisfy the needs of the developing countries at the same time.

Future Legal Challenges

Taking the thread forward, concerning doubts that lingered concerning ownership, as opposed to sovereignty, they were dismissed with the drafting of the Moon Agreement of 1979. The wording of the Agreement, this time, is very clear. Article 11 first states that "the moon is not subject to national appropriation." It goes on to provide "neither the surface, nor the subsurface of the moon, nor any part thereof or natural resources in place, shall become property of any State, international intergovernmental or non-governmental organization, national organization, or nongovernmental entity or any natural person." While the Moon Agreement is not yet applicable to the major space powers, it is nonetheless an important part of the corpus juris spatialis, and the intent to preclude ownership of outer space property is clear. Hence, the issue at hand is whether we are then left with just a singular rule regarding outer space property, namely, "to share and not to monopolize no matter by whom or by what means such claims may be asserted?"

On a close scrutiny of the provisions, it is evident that the Moon Treaty has not yet created an international regime based on CHM to govern the exploitation of lunar minerals--it only requires that parties to the Treaty do so when "such exploitation is about to become feasible." From this perspective, they argue, the Moon Treaty does not currently hinder commercial development of the moon because feasibility (and thus the CHM-based regime) does not yet exist--*res communis* and favorable ownership rights still do.

This argument misconstrues the nature of commercial investment. Even assuming exploitability is not feasible and *res communis* governs, a company preparing to launch a lunar mission will do so on the assumption that *res communis* does indeed govern. But once that mission succeeds, exploitability is thereafter feasible. Once feasible, the Treaty requires the establishment of the regime, which will then impose ex post facto restrictions on mining and profit-keeping—a result which is no longer *res communis* and which thereby shatters the

assumptions upon which the company based its initial mission. This is the essence of the instability surrounding the regime. Any rational investor will be able to see this vicious circle before he invests and will place his money elsewhere. No mineral missions will be launched if there is no investment. Without missions, exploitation will never become feasible, so that a regime will never be created and the minerals will never be mined. However, creating a regime now, whether or not exploitation is feasible, will circumvent this entire morass and permit exploitation of the moon by providing stability.

The Moon Treaty declares that one of the goals of the regime is to ensure "equitable sharing of the benefits derived from those *natural* resources." Here, the greatest uncertainty arises from the meaning of "equitable," and more particularly, how this will impact the amount of profit private companies will be permitted to keep. Developed nations and commercial enterprise are willing to tolerate some "equitable" sharing, perhaps based on contribution to a particular mission or to space technology in general. Developing countries interpret "equitable" as "equal" and desire wholesale redistribution of wealth. Until a meaning is defined and the potential distribution of profits is settled, no investment will occur.

Need For Clarity In Legal Framework

Investors without security?

The problem is how to maintain the interest and investment of the individuals and states on the earth that do possess the power and resources to explore space without being able to guarantee them a stable environment in which to establish settlements on the moon or other celestial body. Ownership and sovereignty accomplish similar purposes in the modern world. They both provide a sense of security. The security lies in the knowledge that the land under the home, factory, or school that is built will not be yanked out from under the establishment in favor of someone else's idea of what should be done with the area involved. Settlers on the moon or other celestial bodies are then left with the question posed by Professor Esquivel de Cocca in his 1992 article: "*In the absence of sovereignty and of jurisdiction and a control authority, who leads and maintains order within the settlement?*" Without order, chaos reigns, and where chaos reigns, investors and new settlers are not likely to follow. Thus, the future of space exploration and settlement depend on forming provisions to be added to the *corpus juris spatialis* that will provide a measure of security to the investors and settlers who embark on journeys of exploration beyond current earth borders.

Ethical standards

Another difficulty in considering ethical standards for the commercialization of space is deciding whose ethical standards we accept? For example, do we adopt the ethical standards provided us by American

politician's, governments (including those other than US), world leaders, religions, corporate leaders, academics, ethics professors and ethicists, authors and writers, Hollywood, family members, a good friend, or simply a mentor? This is a complex decision to make, especially given the globalization that exists in commercializing space. When the globalization factor is added to the equation, the above question is broadened significantly to include the fact that value and ethical system vary greatly based on culture and custom, not just within countries, but even more so across national and international boundaries. And of course, one must not forget that a decision maker or groups of decision makers need to be determined so the issue of how that process unwinds even further complicates the initial stages of the problem.

Even with these above complications to the issue of ethically commercializing outer space, it is likely a given that as a people more than as any particular nation, we are going into outer space in the coming years in ways quite different from our previous space history.

Possible Alternatives For Future

Since the Moon Agreement was finalised, there have been many proposals relating to legal régimes for the exploitation of celestial body resources, ranging from a basic implementation of the terms of the Moon Agreement to a complete overhaul of the existing space law framework. There is considerably scholarly debate over the nature, composition, powers and functions that such a régime should have and it is unlikely that an acceptable régime could be agreed upon and implemented in the near future.

An autonomous panel of individuals who are not dominated or controlled by any nationalistic entities should govern the régime. Webber proposed that a small working group of delegations within COPUOS could formulate a list of space law scholars with the qualifications to be considered. These nominees would not be approved without obtaining the consensus of COPUOS members. 'The COPUOS working group should nominate individuals with the legal and technical expertise necessary to guide lunar resource development and a global vision that transcends national boundaries' and persons that represent their governments in any official capacity should be excluded from selection.

The régime would mainly constitute a licensing system that takes into consideration commercial viability, future access and environmental protection. This licence, to be granted for a sufficient period of time, should not be regarded as a conferral of permanent property rights over the area but the licensee should exclusively control the resources. Under such an international régime, the licence should be sufficient to provide adequate protection for investors seeking security in their investments.

As regards the sharing of profits, some scholars have suggested that a taxation system that would fund the international authority and even a moderate sharing of profits to developing countries. This is unlikely to be acceptable to

developed countries, such as the US, as this would provide an uncomfortable precedent for international organisations being given the power of taxation over the international activities of private individuals.

Realistically, notwithstanding the views of the entrepreneurs, the developing countries are likely to insist on a moderate sharing of profits as a minimum requirement. Hoffstadt proposes a Lunar Commission that sets a maximum return on investment for the privately-owned company in a similar way that Public Utilities Commissions in the US operate. The company would keep any profits under this maximum and any surplus is either split between the company and the Commission or given totally to the Commission.

The Commission would adjust the maximum periodically, keeping into account the commercial risks involved and the level required to attract investors to any commercial space venture. The portion of the surplus collected by the Commission could be used to defray its own costs or channelled into an international organisation such as the World Bank and distributed to the developing nations. Such a system should be satisfactory to the majority of developing countries.

Conclusion

The arena of establishment of private property rights is one aspect of the plethora of issues that need to be settled, like those of weaponisation of outer space, environmental degradation and combating of the same in the global commons, space tourism, and allied ones. As is well-established, customary international law imposes on all states an obligation to ensure that activities within their control do not injure other states, which in the face of widespread and consistent state practice has changed primarily into one of prevention and control. However, the existing legal framework abysmally fails in establishing a concrete liability regime in dealing with issues arising in outer space, high seas, Antarctica, etc. and other areas which have been aptly described as Common Heritage of Mankind.

In order to manage these problems, it is proposed that a global organization be set up to regulate and administer properties found beyond the earth's atmosphere. The organization will have the duty of holding all the lands found in outer space as representatives of the people of earth, since all persons of earth "own" everything in the outer space found within our solar system in undivided, un-transferrable shares. Once a settler or investor can demonstrate to the organization that he/she has either occupied the outer space area, or improved it (including establishment of a resource extraction scheme) for a consecutive period of six earth months, he/she may submit an application for a lease to the organization.

The organization shall consider the lease, and extend exclusive use rights in accordance with principles set out by it. Regarding the exploitation of resources, a more defined scheme is also enacted. When production begins, the investor

shall be allowed to recover all costs incurred in the establishment of the extraction process. When costs have been recouped, the investor shall have six weeks of production wherein he/she shall retain control over 100% of the resources and profits. After that time, investor shall, in keeping with the theory that outer space shall benefit all mankind, split the benefits of production with the global organization at a rate of 60% for the investor, 40% for the organization. The organization will then determine how to disperse its 40% share, with special consideration being given to developing nations.

A more defined base from which to plan, outer space will become a much more viable alternative for exploration and development. The above proposed alternatives attempt to assure incentive and reward for those who make the initial investment in outer space, while maintaining the underlying theory of Space Law.

Select References

1. Edwards, 1979.
2. *Supra* n. 13.
3. It may be noted at this juncture that the principle stumbling block to the acceptance of the Moon Treaty is this "common heritage," or *res communis*, principle, which shall be discussed in greater details subsequently.
4. James J. Trimble, Comment, The International Law of Outer Space and Its Effect on Commercial Space Activity, 11
5. PEPP. L. REV. 521, 559 (1984) ("Private use and exploitation of outer space will require enormous amounts of capital.").
6. Richard A. Posner, The Material Basis of Jurisprudence, 69 IND. L.J. 1, 10 (1993) (noting that purchasers of patents "buy the right to receive a proportionate share of . . . expected monopoly profits"). "With business activity must go a business climate where the private sector understands the rules and feels comfortable with their prospects for commercial success." Don Fuqua, Space Industrialization: Some Legal and Policy Considerations for Private Enterprise, 8 J. Space L. 1, 3 (1980); *see also* Alice Galenson, Investment Incentives For Industry 45 (1986) ("The final and most important point to bear in mind is that perhaps the main determinants of investment are . . . political and economic stability . . .")
7. Agreement Governing the Activities of States on the Moon and Other Celestial Bodies, Nov. 12, 1979, 18 I.L.M. 1434 (entered into force July 11, 1984) [hereinafter Moon Treaty].
8. *Id.* at Art. 11, ¶ 1, 18 I.L.M. at 1438.
9. James E. Dunstan, Toward a Unified Theory of Space Property Rights: Sometimes the Best Way to Predict the Weather is to Look Outside, 11,

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10. Business Manager and Editor, *UCLA Law Review*. J.D. 1995, UCLA School of Law; B.S. 1992, California State Polytechnic University, Pomona.
11. See Judy Allton, 25 Years of Curating Moon Rocks, available at <http://www-curator.jsc.nasa.gov/curator/lunar/news/lnju194/hist25.htm> (last visited Mar. 29, 2005).
12. Nandisiri Jasentuliyana, Article I of the Outer Space Treaty Revisited, 17 *J. Space L.* 129, 141 (1989) (discussing the view of some developing countries).
13. Eilene Galloway, The History and Development of Space Law: International Law and United States Law, 7 *ANNALS AIR & SPACE L.* 295, 300 (1982).
14. See Kurt Anderson Baca, Property Rights in Outer Space, 58 *J. AIR L. & COM.* 1041 (1993) (positing a theoretical framework for property rights in outer space derived from the current agreements and conventions).