UNILATERAL MINING OF SPACE RESOURCES

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I.INTRODUCTION

Since human civilization came into existence natural resources have been so heavily exploited on earth that it is at verge of exhaustion. The declining stock of natural resource on earth operates as a catalytic factor to exploit natural resources from celestial bodies in outer space.[1] Development of space technology over the last sixty years has not only enabled humans to 'escape the bonds of Earth' but also have reduced the cost of space transportation that makes infeasible to exploit mineral resources on celestial bodies. On November 2015, the US Congress enacted the US Commercial Space Launch Competitiveness Act. It enables US citizen to engage in commercial recovery of an asteroid resource or a space resource. The Act entitles them to possess, own, transport, use, and sell the asteroid resource or space resource.[2]

Closely in the lines of the US, the Luxemburg on July 2017 enacted the Act on Exploration and Use of Space Resources (the Space Resources Act) that grants ownership rights in space resources to companies who mine them. Few more states are expected to follow the footsteps of the US and the Luxemburg. These legal developments are foreseen that a 'gold rush' beyond the horizons is on its way. The researcher views 'gold rush' merely a fictitious speculation because space resources are international commons that can be exploited only in accordance with international law and no state can unilaterally legislate for the same in conflict with international law.

Commercial exploitation of space resources raises some fundamental questions - Who owns the space resources? Does international law permit exploitation of space resources? Do States have jurisdictional competence to unilaterally legislate upon the space resources. What is the impact of national legislation granting ownership rights? In this paper an attempt has been made to find answer to the above raised fundamental questions.

II. WHO OWNS THE SPACE RESOURCES?

Dennis M. Hope, an American Entrepreneur claims that "the entire lunar surface, as well as the surface of all the other eight planets of our solar system and their moons (except Earth and the sun)" belongs to his company - Lunar Embassy.[3] The legal basis for his claim is (i)the property never belonged to anyone and Lunar Embassy are the first one to bring a claim, therefore they are the legal owner (ii) obligations of the Outer Space Treaty are applicable only to the Government and not the private individual.

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[1] Ricky J. Lee, *Law and Regulation of Commercial Mining of Minerals in Outer Space* 21 (Springer, Netherlands, 2012); Dennis Wingo, *Moonrush: Improving Life on earth with the Moon 's Resources* 90 (Collector's Guide Publishing Inc., Ontario, 2004).

[2] 51 US Code Chapter 513.

[3]See https://www.lunarembassy.com/ (last visited on January 15, 2018).

It is factually not correct to say that the Lunar Embassy are the first to claim ownership rights over celestial bodies, rather there have been numerous claims much before.[4] Nonetheless since 1980 under such justification the company has been selling plots on the Moon and other planets.

To understand the legal status of celestial bodies first a brief overview of the law of the outer space is presented below.

III. THE LAW OF THE OUTER SPACE

The corpus of space law is largely confined to the five treaties and bundle of non-binding resolutions of the United Nations General Assembly. In just two decades of the inception of the United Nations Committee on Peaceful Use of Outer Space (UNCOPUOS)[5], the committee came up with five international treaties such as, The 1967 Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies (The Outer Space Treaty hereinafter OST)[6]; the 1968 Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Objects Launched into Outer Space (The Rescue Agreement)[7]; the 1972 Convention on International Liability for Damage Caused by Space Objects (The Liability Convention)[8]; the 1975 Convention on Registration of Objects Launched into Outer Space (The Registration Convention)[9] and the 1979 Agreement Governing Activities of States on the Moon and Other Celestial Bodies (The Moon Agreement)[10]. The OST is largely seen as the umbrella legislation governing space activities. The other four treaties are elaboration on specific provisions of the OST.

Apparently, 1979 onwards has been viewed as second phase of law making process. In this phase a bundle of non-binding resolutions were adopted – The 1982 'Principles Governing the Use by States of Artificial Earth Satellites for International Direct Television Broadcasting'[11]; the 1986 'Principles Relating to Remote Sensing of the Earth from Outer Space'[12]; the 1992 'Principles Relevant to the Nuclear Power Sources in Outer Space'[13].

1996 onwards where the Declaration on International Cooperation in the Exploration and Use of Outer Space for the Benefits and in the Interests of All States, Taking into Particular the Needs of Developing Countries[14] was adopted and has been considered the third phase in the law making process i.e. the phase of reinterpretation of provisions of the

[4] For compendium of claim of ownership rights over Moon, refer Virgiliu Pop, *Unreal Estate – The Men Who Sold the Moon* (Exposure Publishing, London, 2006).
[5] The Committee on the Peaceful Uses of Outer Space (COPUOS) was set up by the General Assembly of the UN in 1959 to govern the exploration and use of space for the benefit of all humanity: for peace, security and development. The COPUOS has two wings the legal-subcommittee, which looks after the legal issues in outer space and other is the scientific and technical subcommittee that take cares of the technological developments for peaceful use of outer space. See http://www.unoosa.org/oosa/en/ourwork/copuos/index.html (last visited on January 15, 2018).
[6] 610 UNTS 205 (done January 27, 1967, entered into force on October 10, 1967).
[7] 672 UNTS 119 (done April 22, 1968, entered into force on December 03, 1968).
[8] 961 UNTS 187 (done March 29, 1972, entered into force on September 01, 1972).
[9] 289 UNTS 3 (done January 14, 1975, entered into force on September 15, 1976).
[10] 1363 UNTS 3 (done December 18, 1979, entered into force on July 11, 1984).
[11] UNGAR 37/92 (December 10, 1982).
[12] UNGAR 41/65 (December 03, 1986).
[13] UNGAR 47/68 (December 14, 1992).
[14] UNGAR 51/122 (December 13, 1996).

Outer Space Treaty began. The 2004 'Resolution on the Application of the Concept of the Launching State';[15] the 2007 'Resolution on Recommendations on Enhancing the Practice of States and International Intergovernmental Organizations in Registering Space Objects';[16] the 2013 'Resolution on Recommendations on Legislation Relevant to the Peaceful Exploration and Use of Outer Space'[17] belong to the phase of reinterpretation of the provisions of OST. In 2007 Space Debris Mitigation Guidelines[18] was adopted by the UNGA, which some other author[19] claim is a new era in space law because the resolution was initial drafted outside the UN body and later adopted.

It is but obvious that from 1979 onwards treaty making has come to a standstill and States are interested in non-binding resolutions only.

IV. THE LEGAL STATUS OF CELESTIAL BODIES

A.Article I, OST– Freedom In Outer Space

Article I of the OST grants states the freedom of exploration and use of outer space including celestial bodies. *Hobe* has commented that freedom in this sense means that any entity that benefits from the freedom need not take permission from other governments, but can find out whether any use is possible or use outer space.[20] The freedom conferred in Article 1 of the OST is not unlimited but rather subject to express restrictions stated within the Article 1 itself. "The exploration and use of outer space, including the Moon and other celestial bodies, shall be carried out for the benefit and in the interest of all countries, irrespective of their degree of economic or scientific development, and shall be the province of all mankind."

The common benefit clause denotes that benefit must not be confined only to the country that has made investment but shall be in the general interest of all nations.[21] The phrase 'irrespective of their degree of economic or scientific development' connotes that even a non-space faring nations is entitled for the benefits derived from the activities undertaken by those who are capable.[22] Community aspects in space activities is further highlighted that the outer space and celestial bodies is 'province of mankind'.[23]

This draws the conclusion that outer space and celestial bodies are common spaces, not under the jurisdiction of specific States; therefore any activity in outer space or celestial bodies may not be undertaken for the sole advantage of States.[24]

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[15] UNGAR 59/115(December 10, 2004).
[16] UNGAR 62/101 (December 17, 2007).
[17] UNGAR 68/74 (December 11, 2013).
[18] UNGAR 62/217 (December 22, 2007).
[19] Stephan Hobe, "National Space Legislation: What the International Law Demands and How it isImplemented"in R. Venkata Rao and Kumar Abhijeet (eds.), *Commercialisation and Privatisation of Space: Issues for National Space Legislation* 31 (KW Publishers Pvt. Ltd., New Delhi, 2016).
[20] Stephan Hobe, "Article I"in Stephan Hobe, Bernard Schmidt-Tedd, *et.al.* (eds.), I *Cologne Commentary on Space Law* 34 (Carl Heymanns Verlag, Koln, 2009).
[21] *Id*., para. 38.
[22] *Ibid.*
[23] *Supra* note 20, para. 39.
[24] *Id*.,para. 37.

Outside Article I of the OST there are other specific limitation on the freedom principle like Article II prohibits appropriation of outer space and celestial bodies; Article III calls upon adherence to general international law; Article VI provides for the limitations of non-governmental entities.

B. Article II, OST –The Non-Appropriation Principle

Article I para 2 reiterates, 'freedom' principle includes 'free access to all areas of celestial bodies' but this does not mean access to celestial bodies includes claim to property which is exclusively prohibited by Article II of the OST.[25] Non-appropriation principle contained in Article II of the OST is a fundamental rule regulating the exploration and use of outer space.[26] It confirms "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 last words used in Article II 'any other means' leaves no room for any form or shape of appropriation of outer space by whatsoever means.[27]

C. Article III, OST – Exploration and Use of Outer Space in Accordance with International Law

Apparently the corpus of space law is confined to the above mentioned five treaties but Article III of the OST widens the scope of space law is much beyond these treaties. It provides that international law including the UN Charter applies to space activities.

Explaining the applicability of international law, Judge Manfred Lachs wrote: "By accepting the Charter as part of contemporary law applicable to outer space and celestial bodies, one has to accept it as it is today, including all the progress made during the years it has been in operation. Thus the obligation to conform with the Charter of the United Nations implies not only the application of provisions of international law as defined by it but also those that have grown as a result of the further development of the United Nations and subjected to a new and more up-to-date interpretation."[28]

International law is a continuous evolving law. As and when new treaties are laid, they become applicable to space activities as well.

D.Article VI, OST – Responsibility Of States For Their National Activities

States bear international responsibility for their activities in outer space, no matter whether it is carried by governmental entity or non-governmental entity.[29] This is to ensure that any activity in space irrespective of who undertakes the activity is in accordance with the international law. The non-governmental entities are not prohibited to undertake space activities but States have an obligation to authorize and continuingly supervise their activities. Governmental responsibility for non-governmental activities follows that States are under an obligation to take appropriate steps to ensure that their natural and juridical persons

[25] *Id*., para. 36.
[26] Steven Freeland and Ram Jakhu, "Article II" in *supra* note 20 at 44.
[27] *Id*., para. 54.
[28] Manfred Lachs, *The Law of Outer Space – An Experience in Contemporary Law Making* 15(Sijthoff, Leiden, 1972).
[29] The Outer Space Treaty, 1967, art. VI.

engaged in space activity conduct it in accordance with the international law.[30] A failure in diligent authorization and supervision may even make the state liable to compensate for damages.[31] Knowing that liability is unlimited in 'time, amount and location'[32] utmost precision is expected from the States for all its activity in outer space and especially when a private entity is undertaking such an activity.

Article VI of the OST permits a private enterprise to undertake commercial activities in outer space but responsibility will always be of the State.[33] Requirement of Article VI of the OST to 'authorize and continuingly supervise' has been generally considered to be the fundamental basis for national space legislation.[34] In fulfillment of these international obligations, many countries have enacted national laws empowering their non-governmental entities to take up space activities.[35]

From the above discussion it is ample clear that the status of outer space and celestial bodies is defined in a number of principles contained within the OST.

V. INTERNATIONAL LAW ON COMMERCIAL EXPLOITATION OF SPACE RESOURCES

A. Whether A Private Individual Can Appropriate Outer Space or Celestial Bodies?

Private sectors have shown growing interest in outer space for commercial benefits. Amongst other activities in outer space, mining of space resources has gained popularity in recent years. With innovation in space technology, cost of space transportation is expected to decrease significantly and is foreseen as emerging business opportunity.[36] The 'non-appropriation' principle of Article II of the OST has been seen as a major hurdle in claiming any ownership rights in celestial bodies. Those interested in establishing property rights in the celestial bodies like Dennis Hope, argue that 'non-appropriation' principle of the OST is applicable only to the government and not to private entities.[37]

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[30] *Supra* note 28, para. 122.

[31] *Supra* note 29, art. VII- A launching State is internationally liable for damage caused by space object to another State Party to the Treaty or to its natural or juridical persons.

[32] Armel Kerrest, "Sharing the Risk of Space Activities: Three Questions, Three Solutions," in Karl-Heinz Böckstiegel (ed.) *Project 2001—Legal Framework for the Commercial Use of Outer Space* 136 (Carl Heymanns Verlag, Koln, 2002).

[33] F.G. Von der Dunk, "The Origins of Authorization: Article VI of the Outer Space Treaty and International Space Law"in F.G. Von der Dunk (ed.) *National Space Legislation in Europe: Issues of Authorization of Private Space Activities in the Light of Developments in European Space Cooperation* 3-28 (Martinus Nijhoff Publishers, Leiden, Netherlands, 2011).

[34] Michael Gerhard, "Article VI" in *supra* note 20 at 120.

[35] The Institute of Air and Space Law (IASL), University of Cologne, Germany had undertaken two research project tilted "Project 2001 – Legal Framework for the Commercial Use of Outer Space" and "Project 2001 Plus – Global and European Challenges for Air and Space Law at the Edge of the 21st Century" in collaboration with the German Aerospace Centre. Within the scope of the projects national space legislation was extensively studied upon. For reports of the project refer Karl-Heinz Böckstiegel (ed.), *'Project 2001' – Legal Framework for the Commercial Use of Outer Space* (Carl Heymanns Verlag, 2002) and Stephan Hobe, Bernarhard Schmidt-Tedd and Kai-Uwe Schrogl (eds.), *Project 2001 Plus – Global and European Challenges for Air and Space Law at the Edge of 21st Century*, (Carl Heymann Verlag, 2006) respectively; also refer Paul Stephen Dempsey, "National Legislation Governing Commercial Space Activities" 1(2) *Journal of Space Safety Engineering* 44-60 (December 2014).

[36] Ram S. Jakhu, Joseph N. Pelton, *et.al.*, *Space Mining and Its Regulation* 133 (Springer, 2017).

[37] Rand Simberg, *Homesteading the Final Frontier - A Practical Proposal for Securing Property Rights in Space* (Competitive Enterprise Institute, Issue Analysis 2012, No. 3); also refer Stephen Gorove, "Interpreting Article II of the Outer Space Treaty" 37 *Fordham Law Review* 349-353 (1969).

It is counter argued that prohibition of appropriation is not only a fundamental legal principle of space law but has also acquired the status of *jus cogens*,[38] binding even upon states that are non-party to the OST.[39] Non-governmental entities do not by itself have direct access to space. Rather, by virtue of Article VI of the OST, States authorizes them to undertake space activities. As an authorization condition a State is free to impose restrictions or may even absolutely prohibit a particular activity if it is in conflict with any of its international obligation or is contrary to its national interest, because States bear international responsibility to ensure compliance with international law for all its space activities including those of private entities. For this reason States have an obligation to continuingly supervise the activities of non-governmental entity so that authorizing conditions are strictly complied with not only at the time of seeking authorization but throughout the life of the particular activity. States are themselves the guardians of all their activities in outer space whether they are undertaken by a governmental or non-governmental entity. The prohibition of national appropriation includes appropriation by non-governmental entities including individuals and enterprises because it constitutes a 'national activity'[40].

Such a proposition that Article II of the OST does not apply to private entities will defeat the purpose of the OST because it will nullify the common interest and freedom principle;[41] that intends to impede any State monopolization of space activities, so that all mankind can profit from those activities.[42]

***(i) The Bogota Declaration*[43]**

In 1976 some of the equatorial countries claimed sovereign rights over segments of the geostationary orbit above their respective territories. The assertion was not taken seriously and was rejected as it was in blatant disregard to the non-appropriation principle.[44]

(ii) Nemitz* v. *NASA

In 2001, Greogry W. Nimitz allegedly claimed asteroid 433(Eros) as his private property and sought parking fees from the NASA for placing a spacecraft on this particular asteroid. On being rejected by the NASA for such claim in 2003, Nemitz brought his claim before the Federal District Court of Nevada, which ruled out that the OST did not create any

[38] "They are customary law which cannot be set aside by treaty or acquiescence but only by the formation of a subsequent customary rule of contrary effect"; Ian Brownlie, *Principles of Public International Law* 515 (Oxford University Press, New York, 5th edn.).

[39]*Supra* note 26, para. 55; G. S. Sachdeva, "*Some Tenets of Space Law as Jus Cogens*"in R. Venkata Rao, V. Gopalakrishnan, *et.al.* (eds.), *Recent Developments in Space Law – Opportunities and Challenges* 7-26 (Springer, Singapore, 2017).

[40]Article VI of the OST treats both governmental and non-governmental activity in outer space as national activity.

[41]*Supra* note 36 at 121; *Supra* note 26 at 58.

[42]*Supra* note 19 at 35.

[43] The representatives of the States traversed by the Equator namely Brazil, Colombia, Congo, Ecuador, Indonesia, Kenya, Uganda, Zaire met in Bogota, Republic of Colombia, from November 29 to December 03, 1976 with the purpose of studying the geostationary orbit. The conclusion of the meeting was summed up in the Bogota Declaration.

[44] R. S. Jakhu, "The Legal Status of Geostationary Orbit" VIII *Annals of Air and Space Law* 333-352 (1982).

private property rights on asteroids.[45] For the reasons stated by the district court the Ninth Circuit Courts of Appeal also upheld the decision.[46]

(iii) The case of Lunar Embassy in China

Beijing Lunar Village Aeronautics Science and Technology Co. Ltd. in China claimed to sell land on the moon. The company issued customers a "certificate" that proclaimed property ownership, including rights to use the land and minerals on the Moon. Considering the activities to be in disregard to the laws and regulations, the Beijing administration suspended the licence of a company.[47] The Company in the Haidian District People's Court of China challenged the administrative decision. Citing Article II of the OST to which China is a party the Court rejected the petition of the Company saying no individual or state could claim ownership of the moon.[48]

(iv) The Case of 'Quarrelsome Litigant' in Cuebec

In 2012, a Canadian court declared a Quebec man named Sylvio Langvein 'quarrelsome litigant' barring him from filing lawsuits without authorization because he frivolously demanded sole ownership over planets, including earth and moon.[49]

From the discussions put forth in this section and subsequent state practices, it is established that no amount of use of outer space will ever suffice to justify a claim of ownership rights over the whole, or any part of outer space, including the Moon and other celestial bodies.[50]

B. Whether natural resources from outer space can be appropriated?

On November 25, 2015 the US Congress passed the 'Commercial Space Launch Competitiveness Act'.[51] Title IV of the Act conferred ownership rights for 'asteroid or space resources'[52] to a US citizen. It reads ''A United States citizen engaged in commercial recovery of an asteroid resource or a space resource under this chapter shall be entitled to any asteroid resource or space resource obtained, including to possess, own, transport, use, and sell the asteroid resource or space resource obtained in accordance with applicable law, including the international obligations of the United States.''[53]

Parallel to the US initiative the Luxembourg enacted 'Law of 20 July 2017 on the exploration and use of space resources' that ordained, "The resources of the space are

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[45] *Nemitz* v. *US*,Slip Copy, 2004 WL 316704, D. Nev., April 26, 2004.
[46] *Nemitz* v. *NASA*, 126 Fed. Appx. 343 (9th Cir. (nev.) February 10, 2005).
[47] "Licence of 'Lunar Embassy' suspended" *China Daily*, Oct. 11, 2015, p.no. 2, *available at*: http://www.chinadaily.com.cn/english/doc/2005-11/10/content_493317.htm (last visited on January 04, 2018).
[48] "Court rejects 'Lunar Embassy's' Moon Rights" reported in *the China Economic Review*, March 20, 2007, *available at*: http://www.chinaeconomicreview.com/node/46715 (last visited on January 04, 2018).
[49] "Man Sues for Ownership of Most of Solar System" *Toronto Sun*, Mar. 01, 2012, *available at*: https://torontosun.com/2012/03/01/man-sues-for-ownership-of-most-of-solar-system/wcm/1402f316-5c87-44f8-9311-45cbc6b58a4c (last visited on January 04, 2018).
[50] *Supra* note 26, para. 53.
[51] H.R.2262 — 114th Congress, 51 USC 10101.
[52] § 5130, 51 USC - The term 'asteroid resource' means a space resource found on or within a single asteroid. The term 'space resource' means a biotic resource in situ in outer space including water and minerals.
[53] § 51303, 51 USC.

susceptible of appropriation"[54]. These developments have generated much discourse at the international fora. The important moot issues are whether ownership rights in space based natural resources is in accordance with the 'non-appropriation principle' of the OST? Whether it is legitimate for a State to confer unilaterally ownership rights in space based natural resources?

The second issue is discussed in the subsequent section. As to the first issue there has been a conflict of opinion. Supporters of national mining law are of opinion that while the surfaces of the Moon and the celestial bodies cannot be appropriated by any means but natural resources can be.[55] These laws simply confer private citizens/companies to, extract and own the extracted resources and do not confer any territorial claims on the celestial bodies.[56] "The situation of a private company wanting to extract resources from a sovereign-free celestial body is similar to a commercial fishing vessel in international waters. . . .While it doesn't own the water (land) or the fish (resources) in the water, it has a right to the ownership of the fish once extracted."[57]

The opponent's counter argue, "Space exploration is a universal activity and therefore requires international regulation".[58]

Let us examine whether the international legal regime for mining of space resources is sufficiently defined or an international legal regime needs to be defined. Article I of the OST confers freedom in exploration and use of outer space and celestial bodies. Though the word exploitation of celestial bodies is nowhere been mentioned in the OST but one can argue exploitation of celestial bodies or commercial mining constitutes a kind of use contemplated in Article 1 of the OST, however by virtue of Article II no amount of use, or occupying the territory for mining or any other purposes can give rise to ownership rights in celestial territory.[59] Such use is subject to the rules and principles contained in the OST (i) common interest; (ii) freedom (iii) province of mankind (iv) non-appropriation (v) international cooperation (vi) authorisation and continuing supervision. These principles being so broad and subjective that their implementation will require further elaboration of more detailed provisions.[60]

The closest space law that directly establishes the legal conditions of exploitation of the natural resources of the Moon and other celestial bodies is the Moon Agreement. Article 11 of the Moon Agreement introduces the principle of 'common heritage of mankind' (CHM), which principally reiterates the 'common province' clause of Article I of the OST coupled with the idea of intergeneration equity and preservation of environment for the use of

[54] Luxembourg Law on the Exploration and Use of Space Resources, 2017, art. 1.
[55] Sagi Kfir, "Is Asteroid Mining Legal? The Truth Behind Title IV of the Commercial Space Launch Competitiveness Act of 2015"*available at*: http://deepspaceindustries.com/is-asteroid-mining-legal/ (last visited on January 05, 2018).
[56] Tanja Masson-Zwaan and Bob Richards, "International Perspectives on Space Resource Rights" *Space News*, Dec. 08, 2015.
[57]*Ibid*.
[58] Gbenga Oduntan, "Who owns space? US asteroid-mining act is dangerous and potentially illegal" *The Conversation*, Nov. 25, 2015, *available at*: https://theconversation.com/who-owns-space-us-asteroid-mining-act-is-dangerous-and-potentially-illegal-51073 (last visited on January 06, 2018)
[59]*Supra* note 26 at 53.
[60]*Supra* note 28 at 48.

future generations.[61] Some States have misunderstood the CHM principle that all nations would require sharing equally any benefits derived from the Moon exploration. Contrarily, the wordings of the Moon Agreement expressly state that for an 'equitable' benefit sharing all States Parties must establish an international regime, including appropriate procedures.[62] The purpose of international legal regime was to effectively and transparently govern the exploitation of lunar and celestial natural resources so as to ensure transparency and avoid conflicts by undertaking orderly and safe development of the natural resource; rationale management of resources; expansion of opportunities in the use of those resources; and equitable sharing of resources.[63] It is very clear that a private entity engaged in commercial exploitation of space resources would not be require to share such benefits unless and until prescribed by the international legal regime and that too in the prescribed manner.[64]

Article 11 of the Moon Agreement is very balanced and future oriented;[65] but only fifteen States have ratified the Moon Agreement, so practically it is not of much of significance. Rather these emerging opportunities must be attraction for States to rethink and discuss about the prospects of the Moon Agreement.

It is understood that even if it is agreed taking of space resources may not be in conflict with the non-appropriation principle of the OST, but such taking can only be in accordance with rules formulated by the international community.

C. Whether it is legitimate action of a State to Confer Unilaterally Ownership Rights in Space Based Natural Resources to its Natural or Juristic Persons?

(i) Jurisdictional Competence

The fundamental issue related to the commercial exploitation of space resources is do states have jurisdictional competence to legislate for the celestial bodies?[66] A State may exercise its jurisdiction by way of prescription or adjudication or enforcement. In international law prescriptive jurisdiction refers to competence of a state to make laws, decisions or rules to regulate the conduct of natural and juridical persons.[67] The General bases for exercise of the prescriptive jurisdiction are:[68]

(ii) The Territoriality Principle

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[61] Jakhu, Freeland, *et.al.*, "Article 11(Common Heritage of Mankind/ International Regime)" in Stephan Hobe, Bernhard Schmidt-Tedd, *et.al.* (eds.), II *Cologne Commentary on Space Law* 394 (Carl Heymanns Verlag, Germany, 2013).
[62] Moon Agreement, 1984, art. 11(2).
[63] *Id.*, art. 11(7).
[64] Ram Jakhu, "Twenty Years of the Moon Agreement: Space Law Challenges for Returning to the Moon" 54 *German Journal of Air and Space Law* 254 (2/2005).
[65] Stephan Hobe, "The Moon Agreement, Let's Use the Chance" 59 *German Journal of Air and Space Law* 372-381 (3/2010).
[66] The researcher had the opportunity to raise this issue earlier also in one of his paper published in *German Journal of Air and Space Law.* Refer Kumar Abhijeet, "Appropriation of Space? Apollo Lunar Landing Legacy Bill as a Trigger for Colonization of Space?" 64 *German Journal of Air and Space Law* 653-665 (4/2015).
[67] James Crawford, *Brownlie's Principle of Public International Law* 456 (Oxford University Press, New York, 8th edn.).
[68] *Ibid.*

The territoriality principle is the most fundamental principle of all principles governing jurisdiction.[69] "A State can make laws for, and apply them to, persons and events within its territory".[70]E.g. A person commits an offence in country X. Country X can exercise its jurisdiction against the person who has committed the offence because the offence was committed within its territory.

(iii) The Nationality Principle or the Personality Principle

A State may prescribe for the conduct of its own nationals located beyond the State's national territory and the conduct of its national is not covered by territorial jurisdiction of any other State. E.g.: A national of country X commits an offence in country Y that is not punishable in country Y. Country X wants to exercise its jurisdiction over its national who has committed an offence in country Y.

(iv)The passive personality principle

The passive personality principle aims to protect own nationals of a State who are located outside the territory of the State and are being affected by an event that occurs outside the State's territory.[71] E.g.: In the preceding example if Country Y wants to exercise its jurisdiction over the national of country X who has committed offence in country Y.

(v) The protective or the security principle

A State may exercise its jurisdiction with regard to activities committed abroad that has the potential to affect the security or interest of the State. E.g.: Non-nationals of country X in country Y are engaged in counterfeiting the currency of country X. X may exercise its jurisdiction.

(vi) The effects doctrine[72]

"Where an extra-territorial offence causes some harmful effect in the prescribing state, without actually meeting the criteria of territorial jurisdiction or representing an interest sufficiently vital to the internal or external security of the state in question to justify invoking the protective principle."[73] The doctrine focuses on deleterious effects of extra-territorial acts to the state.[74] E.g. Export/ import of country X being affected by the activities of a non-national companies located outside country X who are member of a cartel engaged in control of international market.[75] Country X may exercise jurisdiction as it affects its trade and economy even though no offence has committed within the territory of country X.

(vii) The Universality Principle

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[69] D.W. Bowett, "Jurisdiction: Changing Patterns of Authority Over Activities and Resources" in W. Michael Reisman (ed.), *Jurisdiction in International Law* 240 (Ashgate Publishing Ltd., United Kingdom, 1999).
[70] R. Higgins, "Allocating Competence: Jurisdiction", *Id*. at 263.
[71]*Supra* note 56 at 100.
[72] It has been very controversial.
[73]*Supra* note 52 at 462.
[74]*Supra* note 53.
[75] *Alcoa* case, *US* v. *Aluminum Co. of America*, 148 F.2d 416 (1945).

As a matter of international public policy every state has a legitimate interest in repression of certain heinous crime like genocide, war crimes or crime against humanity. The objective being the wrong doer must not go unpunished.

Generally if a state desires to project its prescriptive jurisdiction extra-territorially it must find a recognized basis in international law for doing so.[76] A state that intends to unilaterally enact legislation pertaining to governance of space resources, must demonstrate a genuine link with any of the above-mentioned six bases of prescriptive legislation recognized in any of the space treaties.[77] Objectively, it can be deduced that none of the space treaty recognizes the last four bases of prescriptive jurisdiction; conversely states do not have the power to legislate regarding space resources on these four principles.[78]

As discussed in this paper space resource are not within the national jurisdiction of any state. Outer space and celestial bodies are not national territory of any state.[79] So by virtue of Article II of the OST, exclusive jurisdiction of any State over the space resources on the basis of territoriality principle is also ruled out.[80]

Article VIII of the OST read, "A 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 over any personnel thereof, while in outer space or a celestial body. Ownership of objects launched into outer space, including objects landed or constructed on a celestial body, and of their component parts, is not affected by their presence in outer space or on a celestial body or by their return to the Earth." Article VIII do confer power upon the States to exercise personal jurisdiction but it is limited only to space objects and personnel and not to outer space or celestial bodies.

An extraterritorial application of prescriptive jurisdiction should not be unfair from the standpoint of those whose interests would be affected and in an international case must not be inconsistent with the needs of the international system. [81]

There exists a 'global public interest in outer space'.[82] When a state unilaterally legislates for the celestial bodies (allocating ownership rights on space resources) unfairness to other states and even inconsistency with international space law is quite probable for the following reasons:

a. Allocation of mining sites on celestial body

Presently there is no international legal framework to regulate mining of space resources. For profitable investment returns each state engaged in mining of space resources will be interested in mining those areas on the celestial bodies which are rich in resources. A

[76]*Ibid*.
[77] Stephan Hobe and De Man, "National Appropriation of Outer Space and State Jurisdiction to Regulate the Exploitation, Exploration and Utilization of Space Resources" 66 *German Journal of Air and Space Law* 470 (3/2017).
[78]*Ibid*.
[79]*Supra* note 29, art. II.
[80]*Supra* note 77, para. 468.
[81] Willis L. M. Reese, "Limitations on the Extraterritorial Application of Law"*Dalhousie Law Journal* 594 (1978).
[82] Ram S. Jakhu, "Legal Issues Relating to the Global Public Interest in Outer Space" 32(1) *Journal of Space Law* 31-110 (2006).

State, which reaches first, may assert its claim over a particular site depriving other states to take up any activity within the same area, which may even lead to monopoly over the resources. Prolonged unilateral access to a particular celestial site in deprivation to other States is blatant disregard to the freedom principle of Article I of the OST and could even lead to appropriation of the particular area.[83] Therefore rules for allocation of mining sites on the celestial bodies are an indispensable necessity, which can be done only at the behest of the international community and not unilaterally through domestic legislation.

b. Management of space resources

A number of other issues are incidental to allocation of mining sites. The time period for which a country or its authorized private entities is entitled to do mining operation in particular area; protection of artifacts on the mining sites; maintenance of records and data of the resources mined; effective space traffic management for transportation of resources. The management of space resources further creates a necessity for international rules.

c. Access and Benefit Sharing

Article I of the OST enshrines international cooperation principles and mandates that the exploration and use of outer space shall be carried out for the 'benefit and in the interest of all countries, irrespective of their degree of economic or scientific development.' Space faring countries must enable non-space faring countries to participate more actively in space exploration and use.[84] The Declaration on Space Benefits[85] re-interpret Article I and clarify that in the exploration and use of outer space, particular attention should be given to the benefits and interests of developing countries.[86]

It will be unfair if non-spacefaring country or a developing State is not given an opportunity to access and benefit from these nascent extra-terrestrial resources.

d. Ecological consideration

Article IX of the OST is considered to be the basis for the environmental protection of outer space and its preservation for peaceful uses. It also reiterates that there is no unilateral interest in mining of space resources. State parties must give due regard to the corresponding interests of all other States in the exploration and use of outer space including the Moon and celestial bodies.[87] Kaiser explains, "due to low gravity environment of asteroids, mining activities are prone to create clouds of materials that will leave the asteroids and hamper the sustainable access to space and the unobstructed observation of outer space, of celestial bodies and of the Earth."[88] Contamination resulting from mining of space resources has

[83] Ramya Sankaran and Nivedita Raju, "A Framework to Address Burgeoning Commercial Complexities in Space Mining" 66 *German Journal of Air and Space Law* 93 (1/2017).
[84] *Supra* note 77, para. 38.
[85] The 1996 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, UNGAR 51/122 adopted on December 13, 1996.
[86] Space Benefits Declaration, 1996, art. 3.
[87] *Supra* note 29, art. IX, sentence 1.
[88] Stefan A. Kaiser, "Legal Protection Against Contamination from Space Resource Mining" 66 *German Journal of Air and Space Law* 286 (2/2017).

greater potential to cause irreparable loss than the space debris, which in itself is a concern for international community.[89]

VI. LIMITS OF NATIONAL SPACE LEGISLATION

National space legislation is primarily in response to Article VI of the OST but nevertheless states also have their own specific reason to regulate the conduct of space activities.[90] That is why a variation is seen in the contents and scope of national laws of respective countries.[91] The fundamental question that arises from this diversity is what should be the limits of national space legislation? Whether ownership rights over the space resources can be unilaterally brought within the scope of national space legislation? Article VI OST, notes that "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 out 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 shall require authorisation and continuing supervision by the appropriate State party to the Treaty".

Article VI confers prescriptive jurisdiction (based on personality principle) upon the 'appropriate State'[92]. An appropriate State is one that can bear international responsibility.[93] All such activities in outer space for which a State bear international responsibility can be brought and must be brought within the ambit of national space legislation and all such activities must be carried out in conformity with the provisions of the OST. On one hand the scope of national space legislation is very broad because 'any activity in outer space is subject to Article VI'[94] of the OST and on the hand the very same Article VI restrict the scope of national space legislation because no activity in outer space can be in conflict with the provisions of the OST. International law including the UN Charter being applicable to all space activities, any activity that is in conflict with them cannot be within the scope of national space legislation. In the preceding paragraph it has been explained that international law do not confer jurisdiction upon States to legislation upon space resource. This leads to the conclusion that if a State unilaterally legislate on space resources it will be in conflict with compliance with international law principle of Article III of the OST.

Hobe and de Man has expressed that outer space, celestial bodies, including their resources is global commons that fall under the jurisdiction of international community and so space resources are not subject to national jurisdiction.[95] States fundamentally lack jurisdiction to unilaterally legislate and national laws conferring ownership rights over space resources do not have any scope.[96]

VII. THE IISL POSITION PAPERS

[89] *Id.* at 287.
[90] *Supra* note 36 at 131.
[91] Irmgard Marboe, "National Space Legislation in National Space Law" in Frans von der Dunk and Fabio Tronchetti, *Handbook of Space Law* 185 (Edward Elgar Publishing, 2015).
[92] *Supra* note 29, sentence 2.
[93] Frans von der Dunk, *Private Enterprise and Public Interest in the European 'Spacescape'* 19 (Leiden University, Leiden, 1998).
[94] *Supra* note 34 at 109.
[95] *Supra* note 79, para. 478.
[96] *Ibid.*

The International Institute of Space Law (IISL) is an independent non-governmental organization dedicated to "promote the further development of space law and the expansion of the rule of law in the exploration and use of outer space for peaceful purposes".[97] Often on important issues of space law the IISL through its members, who are highly qualified experts in the field of space law has time and again issued position papers that could serve as a secondary source of international law recognized within Article 38 (1)(d) of the Statute of the International Court of Justice.

A. Position Paper on claims to property rights regarding the Moon and other celestial bodies

Within rampant claims by private parties to own the Moon or parts and other celestial bodies; even issuance of 'deeds to lunar property', the Board of Directors of the IISL in 2004 issued consensually statement explaining legal situation concerning such private claims:

> "The prohibition of national appropriation by Article II includes appropriation by non-governmental entities (i.e. private entities whether individuals or corporations) since that would be a national activity. The prohibition of national appropriation also precludes the application of any national legislation on a territorial basis to validate a 'private claim'. Hence, it is not sufficient for sellers of lunar deeds to point to national law, or the silence of national authorities, to justify their ostensible claims. The sellers of such deeds are unable to acquire legal title to their claims. Accordingly, the deeds they sell have no legal value or significance, and convey no recognized rights whatsoever."[98]

In 2009 further statement was issued clarifying that the "since there is no territorial jurisdiction in outer space or on celestial bodies, there can be no private ownership of parts thereof, as this would presuppose the existence of a territorial sovereign competent to confer such titles of ownership."

It was also highlighted that the "present, international space legislation does not include detailed provisions with regard to the exploitation of natural resources of outer space, the Moon and other celestial bodies, although it does set down a general framework for the conduct of all space activities, including those of private persons and companies, with respect to such natural resources….. That a specific legal regime for the exploitation of such resources should be elaborated through the United Nations . . ."[99]

B. Position paper on space resource mining

On 20 December 2015 in response to Title IV of the US Commercial Space Launch Competitiveness Act the IISL issued consensually issued a position paper clarifying that "it is uncontested under international law that any appropriation of "territory" even in outer space (e.g. orbital slots) or on celestial bodies is prohibited, it is less clear whether this Article also prohibits the taking of resources . . .. In view of the absence of a clear prohibition of the

[97] See http://iislweb.org/about-the-iisl/introduction/ (last visited on January 15, 2018).
[98] Statement by the Board of Directors of the International Institute of Space Law (IISL) On Claims to Property Rights Regarding The Moon and Other Celestial Bodies, 2004.
[99] Statement of the Board of Directors of the International Institute of Space Law, March 22, 2009.

taking of resources in the Outer Space Treaty one can conclude that the use of space resources is permitted."[100]

The position only clarified that taking of space resources may be permitted as per international law but did not comment if national laws can confer ownership rights to its private entities. Rather it also proposed for the development of international rules to be evaluated by means of an international dialogue in order to coordinate the free exploration and use of outer space, including resource extraction, for the benefit and in the interests of all countries.[101]

C. Directorate of Studies

A research study under the overall responsibility of Professor Stephan Hobe, Cologne, Chair of the IISL Directorate of Studies, was presented to the IISL Board of Directors at its session ofMarch 26, 2017. It discussed the likely impact of enacting national space legislation that allows for the taking of space resources:[102]

> "The legal framework governing activities in space does not prohibit the exploitation of resources as an activity open to States, but it nevertheless requires that such exploitation shall take place under the conditions laid down in the Outer Space Treaty which are to be shaped in an appropriate international legal order multilaterally."

The IISL position paper re-affirm that, (i) there cannot be any private/ state claim for ownership in the outer space or celestial bodies or its parts thereof; (ii) International space law do not expressly prohibit taking of natural resources from the Moon or other celestial body; (iii) Commercial exploitation of space resources must done in compliance with international law which is yet to be defined for space resources; (iv) The legal regime governing exploitation of space resources must be at the behest of the international community and not unilaterally by any State.

VIII. POSSIBLE SOLUTIONS

It is but obvious that practical difficulties associated with exploitation of space resources are beyond the scope of national laws. It demands the drafting of an international legal order as an international effort and not as a unilateral effort.[103]

A lack of internationally defined legal framework will create uncertainty of behaviors leading to legal disputes.[104] Following solutions have been proposed towards establishing an international legal order that would facilitate exploitation of space resources.

A. The Moon Agreement

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[100] Position Paper on Space Resource Mining, December 20, 2005.
[101] *Ibid*.
[102] IISL Directorate of Study on Space Resource Mining, 2017 "Does international space law either permit or prohibit the taking of resources in outer space and on celestial bodies, and how is this relevant for national actors? What is the context, and what are the contours and limits of this permission or prohibition?"
[103] Stephan Hobe, "IISL adopts Position Paper on Space Resource Mining" 65 *German Journal of Air and Space Law* 209 (2/2016).
[104] Fabio Tronchetti, "Title IV- Space Resource Exploration and Utilization of US Commercial Space Launch Competitiveness Act: A Legal and Political Assessment" 41 *Air and Space Law* 155 (2/2016).

The Moon Agreement, which has been silent since its enactment suggests a possible way forward regarding the commercial exploitation of space resources. States have been skeptic to ratify the Moon Agreement as they are of belief that it prohibits commercial use of outer space. Contrary to this disbelief the Moon Agreement has a much wider scope. It calls for the establishment of an international regime including appropriate procedures to govern the exploitation of space resources. The Moon Agreement is in the very interest of nations and States should hesitate any more to ratify it.

B. The ITU Regulatory Regime

The Geostationary orbit is an important natural resource. The allocation of exploitation rights including allocation of radio frequencies and orbital slots is governed under the aegis of the UN through the International Telecommunication Union (ITU) that has formulated rules to this effect. If States agree the jurisdiction of ITU may be extended over space resource governance as well.

C. The Hague Working Group

Since 2015 The Hague Space Resources Governance Working Group[105] hosted by the International Institute of Air and Space, University of Leiden has been engaged to propose the draft legal framework for exploitation of space resources. On September 13, 2017, the Working group circulated the preliminary result of its work. It has released a set of set of 19 Draft Building Blocks for the Development of an International Framework on Space Resources Activities.[106] The building blocks are designed to lay the groundwork for international discussions on the potential development of an international framework for the governance of space resources.[107] It is expected the international framework will create an enabling factor for exploitation of space resources. Since this an academic exercise engaging all stake holders, one can freely express their views, which is often not possible at the formal law making organs.

IX. CONCLUSION

Article VI of the OST is generally the fundamental basis for States to legislation upon any space activity. But not every activity in outer space can be legislated on the basis of Article VI. An activity, which is in conflict with international law, can never be within the scope of national space legislation. International law do not confer jurisdiction upon States to unilaterally legislate on space resources because it directly affects the interest of international community. An international legal regime governing space resource can only be at the initiative of international community.

'*Pacta Sunt Servanda'* is the cardinal principal of international law, wherein States are expected to fulfill their treaty obligation in good faith.[108] Till the time international community defines the legal regime for commercial exploitation of space resources, mining of space resources is practically not feasible and once such a legal order is defined,

[105] The working group consists of members as well as observers from all over the globe.
[106] https://www.universiteitleiden.nl/binaries/content/assets/rechtsgeleerdheid/instituut-voor-publiekrecht/lucht--en-ruimterecht/space-resources/draft-building-blocks.pdf (last visited on January 15, 2018).
[107] *Ibid*.
[108] Vienna Convention on the Law of Treaties, 1969, art. 26.

exploitation of space resources has to be in accordance with it and so ‘Gold rush’ remains merely fictional.

The US and the Luxembourg law on space resource merely reflect their aspirations and are not of any practical utility because they cannot be implemented till the time international community comes with specific rules regulating space resources.