Analogy, State Practice and Public Private Partnerships: Drawing on International Cooperation to Facilitate Lunar Missions

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ABSTRACT

The technical and financial challenges that go hand in hand with future missions to the Moon (and beyond) should not overlook the legal challenges involved. Such missions are to be construed within the ambit of the principles laid down in the original space treaties. Returning to the Moon provides a new opportunity to address criticisms often directed at the 1979 Agreement governing the Activities of States on the Moon and other Celestial Bodies [hereinafter MOON]. More importantly, it allows more recent experiences of international collaboration in space such as the International Governmental Agreement (IGA) governing the International Space Station (ISS) to be taken into account. A new mission stands a good chance of putting the record about the MOON Agreement straight. This international Treaty is one of the most sensitive among those regulating state activities in Outer Space. Whatever arguments are brought for or against its binding force, future projects that depend on international cooperation can be best served by clarifying the necessary legal parameters and state practice is but one ready tool. The principles of international space law already laid down in the 1967 OST should not be obfuscated.

After briefly outlining the provisions of the MOON Agreement that have attracted criticism, this paper draws on examples of agency collaboration at international level in order to highlight the degree of optimal legal certainty for such ambitious missions. The combined efforts of space agencies indicate that a common approach needs to be mapped out for lunar exploration in the interest of all concerned. The oversights made on Earth, to which the pending ecological implications are witness, warrant timely consideration being given to mankind's activities in exploring the Moon and other celestial bodies. This inevitably entails some consideration of the role of public private partnership within this ambitious venture.

I. The Moon Agreement – Provisions and Interpretation

Some commentators on space law focus rather on the limitations of the MOON's regulatory content than its ultimate objectives. Other critical voices go so far as to deny it any binding force. These views are frequently substantiated by reference to the limited number of state signatures and ratifications to MOON when compared to the number of states constituting the international community.[1] The MOON was the last of the five major space treaties to be agreed at international level.[2] Since then, the international community has preferred to follow the path of developing subsequent

international rules for activities in outer space in the form of non-binding, but nevertheless guiding, UN Resolutions. Since agreement on the MOON, these UN Resolutions continue to be the way forward in highlighting, explaining or even confirming existing or creating new sets of principles governing the international space community.[3] In other words, the MOON Agreement, promulgated a good decade after the Apollo Missions and the milestone landings on the Moon, marks the end of an era of international law-making for outer space by treaty. In its wake, the alternative form of consensual agreement or 'soft law' has been chosen, according to which those legal issues requiring clarification are submitted before the Legal Subcommittee (LSC) of UN COPUOS for deliberation. Whether this signifies anything more than the international community's preference for pragmatism and caution in how to approach scientific exploration of outer space on a secure legal basis is open to conjecture and debate. However, it relegates international law making to a platform where Resolutions are relied on as the main material for interpreting international law. Access to natural resources on the moon was undoubtedly shrouded in the MOON in cautious language, but its interpretation must be in accordance with the methodology recognised when applying rules of international law. Criticism of the MOON is often clouded in language based on political perceptions as to shifts in global geo-political interests of space and non-space faring nations alike, including evolving attitudes to the nuclear programme.[4] Nuclear weapons remain prohibited on or around all celestial bodies, and Article 3.3 MOON stipulates the same in relation to weapons of mass destruction. Even if the MOON reflects compromise, there are, on closer reading, already sufficient provisions on which to stake future exploration. The MOON contains a commitment of its state parties in Article 11.5 to establish an international regime for exploitation of its natural resources. Even if this does not apply to non-state parties, the latter are still constrained by the provisions of Articles I and II OST. Mobilising the community to agree to a new treaty is unlikely to be an effective way to move forward in the next decade of exploration. Yet stopping the space effort to the Moon and beyond simply because of lack of clarity as to the way forward seems retrograde. There are issues of participation and benefit in both costs and gains, and notably in future resources. The space effort requires international cooperation, involvement and inclusion of new and interested states, and new drive.

I.1. The Critique

The individual criticisms against the MOON can be briefly summarised as follows. Firstly, MOON is lacking precision in its conceptual notions as to just what access to its natural resources legally – and not merely semantically – entails. The provisions of Article 2 MOON proscribe states with duties of compliance with international law. The concepts of non-appropriation in Article I and II Outer Space Treaty (OST), as reiterated and combined with exploration and use in Article 4 MOON, leave too much room for interpretation as to where exploration starts and exploitation and appropriation may stop. The existence of natural resources on the Moon and the Agreement's recognition under Article 6.2 of a right of access and to extraction of samples call for a clear border line between exploitation and use. Against this, arguments are put forward as to how international law provides for interpretation of these terms. Tools of interpretation range from a provision's ordinary or literal meaning as provided by Article 31 Vienna Convention on the Law of Treaties (VCLT)[5] through to its object and purpose, bearing in mind the views of state parties to a treaty, alongside the requirement of bona fide interpretation.

Further irritation is, however, caused by concepts such as that used in Article 11 MOON of the common heritage of mankind (CHOM). Article 4 already refers to exploration and use of the MOON as the province of mankind. The CHOM has been seen as having its roots in the seventies and being a notion that goes beyond that expressed in Article I OST as being the province of all mankind, emerging thereafter in the context of the law of the sea and finally United Nations Conference on the Law of the Sea, UNCLOS.[6]

In short, there are two issues: firstly, the international community is looking for an effective and realistic way to foster progress in lunar exploration; secondly, it concedes concerns that scientific exploration should be continued on the basis of an international *modus vivendi* that at all times reflects the law *de lega lata.*[7] This means putting the record straight about MOON for state parties and non-state parties to the Agreement. It is clear that no private or public property or ownership rights can ever accrue to resources, parts or property on the Moon, neither by virtue of Article II OST nor by virtue of Article 11.2 MOON.[8] The MOON is, however, silent as to how to move towards the international regime designed under Article 11.5 in fleshing out those types of activities that may legitimately be undertaken. Moreover, there is some concern as to the exact position of non-state parties to the Agreement.

Various provisions of the MOON are, however, crystal clear. Firstly, the Secretary-General of the UN is to be informed of any activities relating to activities relating to exploitation and use of the Moon, particularly timing, duration and orbital parameters. This rule has its origins in the clear need for safety and ecological discipline. Secondly, scientific investigation is to be carried out on a non-discriminatory basis, on the basis of equality and for the benefit of mankind. This includes an inter-generational equitable component that scientific activities be carried out for the benefit of future generations. By referring to the benefit of mankind, it becomes clear that the MOON prohibits appropriation of any sort.

The law of outer space is evolutionary in nature. At the time MOON was agreed, the first lunar missions had been completed. The current debate relates to new thresholds and establishment for the next phase of access and exploitation. The MOON contains provisions relating to jurisdiction, responsibility, liability, and rational ecological management. This is where the focus of the international community of space-faring and non-space faring nations alike should now lie.

II. Analogy and State Practice

Analogy is a tool of legal reasoning that enables rules applying in one sphere to be compared and applied to a similar situation in another sphere of law where a specific or clear rule is lacking.[9] In international law, analogy may provide an aid to the sources of law listed in Article 38 (1) and (2) Statute of the International Court of Justice, thereby clarifying the boundaries of what is permissible, particularly in the case of state action and state practice. There are various schools of thought in international law about the degree to which states can act independently of existing rules or may take a singular independent action against what is seen to be common practice.[10] Since the sources of international law may be more restricted than others, certainly more than national law, analogy permits parallel application of a rule that for formal reasons would not otherwise be available. The ability to rely on techniques of legal analogy is particularly important in the context of outer space activities, where the development of the law is linked to the activities and views of those few states involved in space activities. There are, moreover, clear indications that more states

are also becoming active in space.[11] Analogy is, therefore, a useful tool for interpreting and analysing development in the law of outer space.

State practice is an important factor in establishing and ascertaining principles of international space law. Through it, actions of states in practice can be relied upon to demonstrate and establish the existence of customary rules of law. State practice goes far in defining what may be seen as legitimate action for the international community. Questions as to how long and in what form state practice must be demonstrated depend largely on the activity in question. In regard to exploration and use of the Moon, including access to its surface, the scientific dictates of OST are in any case reinforced in MOON. The same prohibitions exist in MOON against military weapons, bases or establishments on the moon (Article 3.3, Article 3.4), as in OST. However, the MOON facilitates a scientific presence in greater detail, including operations, and allows manned or unmanned stations and space objects to be established in terms of its Article 9. Jurisdiction over national entities, including non-governmental entities exists under Article 12.1, in the same vein as under Article VIII OST, in conjunction with Article VI OST.

The immediate issue for the scientific community is less the extent to which the Moon can be accessed than the issue of the limits of exploration and use of its natural resources, notably in the light of potential commercial interests.[12] The issue of state practice and the length of time required to demonstrate existence of a practice pose a challenge to outer space activities, and particularly those on the Moon or other celestial bodies. Activities to date have been notable, their effect a measure of quantum dimensions and not pure time. Neither OST nor MOON regulates the rules for extraction of the latter's resources. The MOON's inclusion of the commitment in Article 11.5 to create an international regime governing the exploitation of natural resources is significantly timed to take place 'as such exploitation is about to become feasible'. On an ordinary reading of these words, this means in sufficient time and prior to new missions or plans for accessing the Moon's resources. The debate today is, therefore, the extent to which the community of states – and not exclusively space-faring nations – is willing and prepared to move forward. This framework has not yet been formulated and should be addressed soon. This would enable a regime to be developed that provides for the community of states in advance of clear pending issues. Conclusions to several clear issues are required. Firstly, whether states that are not parties to the MOON are permitted to extract resources from the MOON? If so, then they must have regard at least to Articles I (1), VI and XI OST. They must also act in the spirit of OST. This requires communication of scientific discoveries. That a more precise regime would be required for lunar exploitation was clearly seen at the time of the MOON's drafting. It was relegated as a future project to be undertaken at a timely stage.

It is also important to bring together the (divided) community of space faring and non-space faring nations. The attendance of certain states at meetings of the Legal Subcommittee – while only a latent indicator of positions – indicates that the divide between developed and developing states stands to be overcome by the digital divide itself. A new Moon agenda could offer a perfect opportunity. Technologically strong states must be included in the debate as to what exploitation of the Moon involves. Its scientific and ecological potential is in the interest of a far greater number of states than the original space faring nations alone. This would mark a new era for the exploration and exploitation of outer space.

III. Scientific Progress

The pursuit of greater scientific knowledge and discovery remains a concern to the community of space-faring and non-space nations alike. There have been clear indications recently, notably by the current US administration, to the effect that their back-to-the-Moon missions and space efforts are to be cut.[13] The response of the space community, from individual astronauts, various authors and space agencies alike, has been a consolidated call for the lunar exploration effort to continue.[14] Maintaining the previous level of exploration, notably in human space flight, requires large budgets. With new technologies nowadays, space exploration can be tooled both from outer space and at ground level: not all discoveries need take place in outer space. The continuing economic crisis and accompanying uncertainties are a threat to continued human and non-human space exploration effort. The Obama administration has been forced to make a political choice based on overriding economic considerations against continuation of its Constellation programme.[15] The number of nations economically able to bear the cost (or justification) of the inter-planetary space effort is limited. This is unlikely to change. Nor do all of the signatory states to the MOON fall within this privileged category. This is another reason why projects relating to the Moon and beyond should be built on cooperative architecture. The experience of the ISS is a clear witness to such an effort, even although this successful venture is a product of predominantly space-faring nations.[16] Ensuring investment in further space activities is a priority. This requires a new architecture for benefit-sharing.

IV. Commercial exploitation

The only true form of advanced commercial exploitation known to the space community is satellite telecommunication. Specific communities that are active in the space sector, notably in the USA, are still in a position to demonstrate commercial capability and development. However, profit making – as opposed to cost-recovery – missions are still keenly awaited to herald the advent of commercialisation in other areas of space activities.[17] The commercial viability of the ISS, even although openly propounded, is not yet fully visible.[18] While commercialisation remains important from the perspective of facilitating business and growth, it does not relieve states from their clear responsibilities and liabilities in international space law under Articles VI and VII OST as well as Article 14 (1) and (2) MOON. The link between a business venture and its responsible state under Article VI OST remains an important issue in the law of outer space and exploration, as well as under Article 14 MOON that expands this provision.

A major factor behind commercial operations is regulation of intellectual property (IP). In the case of the ISS, where the various state parties to the agreement retain jurisdiction over their own objects and component modules by virtue of Article 16 IGA, it was agreed in Article 21 IGA that IP rights would belong to the participating states as owners of the modules.[19] This aspect must be ensured if partners to any future Moon ventures are to be found, particularly if any conclusions are to be made as to how business is to become more involved. Where research funding is used to enable missions, then compliance with IP terms that take into account the interests of states and business alike will be a condition of the funding.

Beyond this, earth-based activities may represent a potential for developing commercial applications as an interface to

outer space exploration. Further technological development will help lead the way to identifying and developing new markets. Whether there is scope for commercial applications within other growth markets on orbits beyond LEO which produces space imagery remains to be seen. Space activities in the 21st century need not be operated exclusively in outer space.

In relation to exploration of the Moon, however, commercialisation can only take place within the confines of sustainability. The ecological responsibilities of states parties towards planetary protection and environmental care remains vital. This requirement is firmly anchored within the provisions of Article 14 MOON.

If any form of PPP is to become viable and sustainable, then IP must not only be located with its responsible state(s), with agreements as to concessions and licensing in hand. A further necessary addition is some form of relief or indemnity from otherwise pending responsibilities and liabilities that governments may make by virtue of national space statutes or concession agreements towards the industry. This was the very reason for failure of the Galileo PPP and should not be seen again in the context of such important scientific projects as further lunar exploration.[20]

V. The Way Forward

The foregoing reflects on possible developments in the regulatory environment for space activities, notably on the Moon and beyond. Given the limited potential for all states to undertake the future space effort on their own, it seems expedient to join forces, in so far as this can be achieved. This means addressing the following: firstly, setting an agenda that enables a suitable regime for exploitation of and benefit from the Moon's resources as provided by Article 11.7 MOON. Secondly, in so doing, regard should be had to the realignment in space capabilities, with a view to bridging the current divide between old and new space-interested nations. The advent of space downstream services and the growth of the information society could serve as a platform on which to enable future collaborative progress that moves towards closing the gap, particularly between developing and developed states. This entails delimiting the categories of exploration, exploitation and use. It requires refocusing on notions of common benefit and heritage. It is an exercise that should be undertaken together with those who have not (yet) signed the MOON and in the forefront of further missions and operations to the Moon and beyond.

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[1] As of January 2010, there are 13 ratifications and a further 4 signatories, see http://www.oosa.unvienna.org/pdf/publications/ST_SPACE_11_Rev2_Add3E.pdf

[2] Agreement governing the activities of States on the Moon and other Celestial Bodies (MOON Agreement), 1363 UNTS 3, available at http://www.oosa.unvienna.org/pdf/publications/ST_SPACE_11_Rev2_Add3E.pdf

[3] There are 5 sets of Principles: Principles governing Activities of States, Principles on International Direct televisions Broadcasting, Principles Relating to Remote Sensing, Principles relevant to the Use of Nuclear Power and the Declaration on International Cooperation in the Exploration and Use of Outer Space, available at .

[4] This point is raised by J. Gabrynowicz, in: her Comments, Proceedings of Conference on the MOON, McGill University McGill, 2006, Session 4, available at http://www.mcgill.ca/iasl/publications/proceedings, p. 233-239.

[5] Vienna Convention on the Law of Treaties, adopted 26 May 1969, 1155 UNTS 331, 8 ILM 679 (1969).

[6] For an overview of the Convention and its status, see http://www.un.org/Depts/los/convention_agreements/convention_overview_convention.htm

[7] See in particular the Declaration on International Cooperation in the Exploration and Use of Outer Space for the Benefit and in the Interest of all States, Taking into Particular Account the Needs of Developing Countries, UNGA, res. 51/122 of 13 December 1996, available at http://www.un.org/documents/ga/res/51/a51r122.htm

[8] See the Statement of the Board of Directors on the IISL as to property rights on celestial bodies,

including the moon at http://www.iislweb.org/docs/IISL_Outer_Space_Treaty_Statement.pdf

[9] See Siljy Vönecky, Max Planck Encyclopaedia of International Law, available at http://www.mpil.de/shared/data/pdf/pdf_epil_analogy_voeneky.pdf

[10] The S.S. Lotus Case, September 7, 1927, PCIJ, available at http://www.worldcourts.com/pcij/eng/decisions/1gateway/1927.09.07_lotus2.htm

[11] Nigeria, South Africa, Brasil, Venezuela, China, India.

[12] Reference has been made to the fact that the US American delegate to the UN in 1979 indicated that it was not the intention of the US to consider a moratorium on exploitation of lunar resources, see P.P.C. Haanappel, in: Proceedings of Conference on the MOON, McGill University McGill, 2006, Session 4, n.4, above, p. 224 ff.

[13] On the decision of the Obama adminstration vis a vis the space programme, see http://www.space.com/news/nasa-budget-moon-future-100201.html

[14] See for example reports n the New York Times, available at http://www.nytimes.com/2010/04/16/science/space/16nasa.html

[15] For a cutting edge account of how reducing the Constellation programme will favour private space initiatives in the USA and, in particular, Bigelow, see Economist, February 18, 2010, http://www.economist.com/research/articlesBySubject/displaystory.cfm?subjectid=894660&story_id=15543675

[16] The state parties to the ISS are USA, Russia, Japan, Canada and member states of the European Space Agency, ESA.

[17] Mr. Bigelow's personal investment in space is historically unique in volume. His project to create expandable space habitats - so-called Sundancer - is scheduled for 2014, id.

[18] G. Haskill, M. Rycroft (eds.), International Space Station: The next space marketplace, Kluwer, 2000; further, M.S. Smith, U.S. Space Programs: Civilian, Military, and Commercial, Washington D.C., USA . UNT Digital Library. http://digital.library.unt.edu/ark:/67531/metacrs5339/, accessed May 18, 2010.

[19] For details of the IP solutions used in the ISS, see Article 21.2.Agreement on International Space Station available via http://www.nasa.gov/mission_pages/station/structure/elements/partners_agreement.html. See further, André Farand, *International Space Station Utilisation: Current Legal Issues*, in *"Project 2001": Legal Framework for the Commercial Use of Outer Space*, 16 STUDIES IN AIR AND SPACE LAW, 389; v.d.Dunk/ Bruns (eds), International Space Station: European Perspectives on Commercialisation, Brill, 2007.

[20] On the difficulties leading up to and beyond the Galileo PPP, see Commission Communication, Progressing Galileo: Re-profiling the European GNSS Programmes, COM (2007) 534 final, 19.9.2007.