

RECENT PLANS TO EXPLOIT THE MOON RESOURCES UNDER INTERNATIONAL LAW*

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ABSTRACT

The plans to exploit the moon resources embodied in the speech of U.S. president Bush of January 2004 have brought a new input in the discussions on the future of the regime of lunar natural resources. According to the Outer Space Treaty, the use of the moon is free provided that the envisaged exploitation of lunar resources is carried out without any appropriation of the exploited area, any occupation of the moon being prohibited by the Outer Space Treaty. Concerning the applicability of the Moon Treaty to the potential realisation of the U.S. plans, only the few rules of customary international law which are part of it can be taken into account: As concerns the exploitation of lunar natural resources, the regime of collection and disposal of space samples can be relevant. It seems, however, that the envisaged activities should serve practical purposes enabling sustainable life on the moon and making expeditions to other parts of outer space more likely. This does not mean, either, that these activities would be prohibited by international law. It only seems to prove how necessary it is to establish a transparent international regime of the exploitation of lunar natural resources.

INTRODUCTION

For years, the exploitation of the moon natural resources seemed to be a matter of a far future. Accordingly, since the entry into force of the 1979 Moon Treaty¹ the discussions on the legal regime of this exploitation remained mostly on the academic level: Because of the purely hypothetical character of the activities concerned, also the revision conference of the Moon Treaty, envisaged for the year 1994, did not take place² as the UN Outer Space Committee had recommended that the General Assembly should take "...no further action at that time"³.

This situation might have changed after U.S. president *George W. Bush* announced plans for space travel during the coming decades in January this year which involved extended human missions to the moon as early as 2015, with the goal of living and working there for increasingly

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extended periods of time⁴. In the framework of these plans, the moon resources should be exploited in order to make the exploration of further outer space more feasible. For the implementation of these goals, international partners should be looked for⁵.

It is not easy to assess whether these plans are only a part of the pre-election rhetoric or whether and to which extent they should be taken seriously. The second alternative seems to be supported by the fact that in the corresponding NASA documents⁶, the implementation of these plans has been given the "highest priority" and taken in account by the Fiscal Year 2005 budget⁷. The NASA's budget should increase by five percent per year over the next three years and about one percent for the following two years⁸ which would facilitate the implementation of these plans to a significant extent. Furthermore, the organisational aspects of these plans are subject to the U.S. Executive Order Creating the Presidential Commission on Implementation of United States Space Exploration Policy of January 30, 2004⁹. According to this act, the Commission shall be composed of not more than nine members appointed by the President (Sec. 2) and should have recommendatory powers (Sec. 3). It shall examine and make suggestions to the President regarding *inter alia* "the exploration of technologies,

demonstrations, and strategies, including the use of lunar and other in situ natural resources, that could be used for sustainable human and robotic exploration" (Sec. 3 b ii). The Commission should submit its final report to President within 120 days of its first meeting.

In case there are serious plans to "harvest the moon resources" in the foreseeable future, the issue of the legal regime of the exploitation of natural resources of the moon will regain its relevance, both *de lege lata* and *de lege ferenda*; this paper, however, is focused solely on the *de lege lata* aspects of this issue: As concerns the question as to the compatibility of these activities with currently applicable international law, it should be assessed whether they are in accordance with the principles and provisions of the Outer Space Treaty of 1967¹⁰ which is binding upon the United States. In this context, the question as to the extent of its Article II prohibiting "national appropriation" of the moon is of particular relevance. Second, despite of the fact that the United States are not a Party to the 1979 Moon Treaty, the question arises whether and how their moon activities can be measured on the Moon Treaty principles, specifically the policies of its Article 11 providing the basis for an international regime of exploiting lunar natural resources as well as of its Article 6

on using its mineral and other substances “in quantities appropriate for the support of the missions”. Third, the U.S. plans on exploiting the moon’s minerals might reopen the general question as to the future establishment of an international Moon-regime.

1. LEGAL STATUS OF THE MOON RESOURCES

It is not necessary to go into the details of the presently two coexisting legal regimes of the natural resources of the moon¹¹, a situation which reminds partly of the law of sea during the 1980s.

The Outer Space Treaty which has been, so far, ratified by 98 States¹² made the moon and other celestial bodies *res extra commercium*. This regime which precluded the space powers from appropriating territorially portions of outer space, the moon or celestial bodies, let the hypothetical question of the regime of the – at that time also only hardly probable – exploitation of lunar resources unresolved; the majority of space law authors defended the thesis that the States were free to appropriate these lunar resources, the only condition being that their use was conducted with due regard to the corresponding interests of all other States Parties to the Treaty (Article IX)¹³.

The dissatisfaction of most of the

developing countries with this concept led to the initiative to declare the outer space and the celestial bodies “common heritage of mankind”¹⁴ which started with the Argentinean Draft Agreement on the Principles Governing Activities in the Use of the Natural Resources of the Moon and Other Celestial Bodies presented to the Legal Sub-Committee of the COPUOS in 1970¹⁵. The draft required the benefits from the use of these resources to be made available to all; however, a distinction was drawn between resources used *in situ* and those brought back to Earth.

It is also generally known that the Moon Treaty which binds, at present, ten States¹⁶ – no one of the space powers being among the States Parties – has incorporated this concept. Article 11 para 1 defines the moon and its natural resources as “common heritage of mankind”; Article 11 para 3 prohibits national appropriation of the surface and the subsurface of the moon, any part thereof or “natural resources in place”. This rule has several, not very precisely defined exceptions¹⁷: According to Article 6 para 2, States Parties are entitled to collect and remove from the moon samples of its minerals and other substances; these remain at the disposal of those States which collected them and may be used by them for scientific purposes, the main feature of this form of use of natural resources of the moon being their goal “for

scientific purposes". The other form of use of lunar resources explicitly authorised by the Moon Treaty is the use of "mineral and other substances of the moon in quantities appropriate for the support of the missions" of the States concerned "in the course of scientific investigation"; again, the use of these resources has been conditioned by the relatively vague terms of "scientific investigation", together with the aim of the use as "support of scientific mission" as well as the quantitative condition of "appropriateness".

Notwithstanding the mentioned very limited number of States Parties to the Moon Treaty, the question – to which a vast amount of doctrinal literature has been devoted¹⁸ and which was also discussed at a number of experts meetings¹⁹ – remains as to whether lunar natural resources which cannot be defined as "samples" or "substances in quantities appropriate for the support of missions" are free to be exploited or whether Article 11 para 3 of the Moon Treaty has imposed a moratorium on the exploitation of these resources which can be suspended only by establishing an international regime as provided for by Article 11 para 5 of the Moon Treaty: According to this provision, the States Parties undertake to establish an international régime to govern the exploitation of the natural resources of the moon once such exploitation is "about to

become feasible". The approaches to this issue differ substantially: One group of authors finds, in particular, in the *travaux préparatoire* of the Treaty an argument for refusing any possible moratorium²⁰. Some distinguished authors identify in Article 11 para 3 of the Moon Treaty the right of States Parties to exercise property rights over items removed from their "in place" position²¹ based on the "accepted practice" of the States Parties of the Moon Treaty: It has been argued that "...while Article 11 (3) prohibits a party from exercising property rights ... over natural resources in place, accepted practice has established that when any such object is removed from its "in place" condition, the removing State, if a party to the Agreement, may accord proprietary rights to these objects"²². Without going into the details of this *a contrario* reasoning, one can hardly speak about the "accepted practice" of the States Parties of the Moon Treaty: It has already been mentioned that none of the space powers has ratified this agreement. Other authors²³ foresee the mentioned international régime to be equipped by a new international agency which would be entitled to decide about the distribution of the lunar natural resources as the best potential means for accomplishing the harmonisation of the interests of mankind with the interests of States.

It can be concluded that, as yet, no final legal regime of lunar natural resources could have been elaborated by the States Parties to the space treaties since there are fundamentally different concepts proposed by various groups of States based on different possibilities, demands and necessities. The common denominator of these concepts seems to be very low, concerns again only the States Parties of the Moon Treaty and relates only to the collection of samples of minerals and other substances from the moon (Article 6 of the Moon Treaty) and the use of these substances for the support of space missions. There is neither consensus on the question of a moratorium of exploitation of lunar resources nor on the feasibility of the international regime of this exploitation. Therefore, it is suggested that the rules on the use of outer space including the moon and other celestial bodies which are part of the Outer Space Treaty continue to be the general basis of the exploitation of these resources.

2. THE CHARACTER OF THE ACTIVITIES ACCORDING TO THE U.S. PLANS

In his speech of January 14, 2004, U.S. president Bush announced²⁴: “America will return to the Moon as early as 2015 and no later than 2020 and use it as a stepping stone for more ambitious

missions. A series of robotic missions to the moon ... will explore the lunar surface beginning no later than 2008 to research and prepare for future human exploration. Using the Crew Exploration Vehicle, humans will conduct extended lunar missions as early as 2015, with the goal of living and working there for increasingly extended periods. The extended human presence on the Moon will enable astronauts to develop new technologies and harvest the Moon's abundant resources to allow manned exploration of more challenging environments. An extended human presence on the Moon could reduce the costs of further exploration, since lunar-based spacecraft could escape the Moon's lower gravity using less energy at less cost than Earth-based vehicles. The experience and knowledge gained on the Moon will serve as a foundation for human missions beyond the Moon, beginning with Mars.“

Furthermore, the version of the speech submitted by NASA explains that human missions to the moon will serve as precursors for human missions to Mars and other destinations, testing new sustainable exploration approaches, such as space resource utilisation²⁵, whereas the version of the speech submitted by the BBC News²⁶ says that “the moon is home of abundant resources. Its soil contains raw materials that might be harvested and

processed into rocket fuel or breathable air.”

How can these activities qualified in the terms of present international law?

At first, the lunar surface should be “explored”; this activity corresponds to the terminology of the “exploration of outer space, including the moon and other celestial bodies” in the sense of Article I of the Outer Space Treaty. If kept within the framework of scientific investigation, the “exploration” can include also “collecting of samples” of the mineral and other substances of the moon resources in the meaning of Article 6 of the Moon Treaty²⁷.

Further, the Moon’s resources should be “harvested”. There is no doubt that this term has to be understood as a “use” of the moon in the meaning of Article I of the Outer Space Treaty as well as Article 2 of the Moon Treaty. According to President Bush, lunar natural resources should be used both for the support of the “human presence” in the sense of Article 6 para 2 of the Moon Treaty as well as – if the BBC version of the speech is authentic – for the production of breathable air and rocket fuel. It is not clear from the context whether the use of lunar natural resources should be limited to the “use of mineral and other substances on the moon in quantities appropriate for...the missions” of the States concerned as presupposed by the Moon Treaty or whether it should go

beyond its limits. Despite of the lack of any precise description of the activity concerned, the poetical term “harvesting” of lunar resources leads to the assessment that the envisaged activities should go further than to missions’ support and can be qualified as “exploitation” of lunar natural resources in the sense of Article 11 of the Moon Treaty.

3. THE PLANS IN THE LIGHT OF INTERNATIONAL LAW

A. The Outer Space Treaty

The United States ratified the Outer Space Treaty on October 10, 1967; at the same day, the Treaty entered into force and started to be binding upon the United States as its Party. It might me interesting, thus, to examine to which extent the lunar activities envisaged by the U.S. president comply with its rules.

As it has been mentioned already, the new U.S. space program starts from the “exploration” of the lunar surface. For this sort of activity, the Outer Space Treaty contains several rules: Generally, this exploration is free for all States (Article I para 2, para 3); however, this freedom is not unlimited and is subject to several restrictions: It has to be carried out for the benefit and in the interest of all countries (Article I para 1), without discrimination,

on a basis of equality and in accordance with international law (Article I para 2), and with due regard to the corresponding interests of other States Parties (Article IX). Moreover, the scientific investigation of outer space should be accompanied by the facilitation and encouragement of international co-operation in such investigation (Article I para 3).

There are only few details in the speech of President Bush which would allow any judgement on the envisaged implementation of these rules in all their facets; on the other hand, there are also no indications that these conditions should be infringed upon. As concerns the last one, there has been a clearly formulated intention of seeking after international partners for implementation of the goals of the program²⁸.

The planned "harvesting" of the moon resources in the sense of their "use" (Article I of the Outer Space Treaty) has a similar regime to the one applicable to "exploration" in the Outer Space Treaty, but is subject, however, to more limitations. Also this form of space activity is generally free, but conditioned by the regard to the benefit and the interest of all countries (Article I para 1), the prohibition of discrimination, the necessity of equality, the accordance with international law (Article I para 2) and the due regard to the

corresponding interests of other States Parties (Article IX).

The compatibility of the exploration of the lunar resources with the Outer Space Treaty depends, however, to a great extent on the character and intensity of these activities: If the "harvesting" should include some mining activities – and the part of the BBC version of the speech which speaks of "production of breathable air and rocket fuel" seems to indicate this intention – it has to be seen that, according to Article II of the Outer Space Treaty, the moon is – and unambiguously so – not subject to any national appropriation by claims of sovereignty, by means of use or occupation or by any other means (Article II). This means that the envisaged exploitation of the lunar natural resources would have to be carried out without any occupation of any lunar territories, areas or slots by any means²⁹. Moreover, Article I para 2 of the Treaty requires "free access to all areas of the moon and other celestial bodies" (Article I para 2); it means that the areas used for exploitation of lunar natural resources would have to be unlimitedly accessible to all subjects from other States Parties to the Treaty, irrespective of the necessity to fulfil the conditions of reciprocity and advanced notice required for the visits of the "stations, installations, equipment and space vehicles" by Article VII of the Outer Space Treaty.

What are the possibilities offered by the Outer Space Treaty if there occur doubts about the compliance with these conditions by the United States? For such a case, the Outer Space Treaty envisages a consultations mechanism based on the negotiations scheme. The condition for the start of this mechanism is the reasonable belief of a State Party that an activity or experiment planned by another State Party in outer space, including the moon and other celestial bodies, would cause potentially harmful interference with activities in the peaceful exploration and use of outer space, including the moon and other celestial bodies. Applied to the U.S. planned exploration activities, these conditions could be fulfilled by the official announcement of the plans by the head of the State, the envisaged large scale of the activities concerned (“harvesting”) and the belief that this sort of activity could either exclude potential further users from the activity in the same area or reduce the non-sustainable sources available on the moon in detriment to the interests of other States. It must be seen, however, that the consultations mechanism under Article IX of the Outer Space Treaty is only optional and relatively weak: Because the State concerned is entitled only to “request” a consultation, the State planning the activity is not obliged to enter into it. In such a case, the State concerned seems to be left

to the mechanisms of state responsibility which do not cover any planning of an activity but the infringement of the provisions of the Outer Space Treaty by the concrete, factual “national activities in outer space, including the moon and other celestial bodies”.

B. The Moon Treaty

Concerning the relevance of the principles of the 1979 Moon Treaty to the U.S. plans to the exploitation of lunar natural sources, it has to be underlined that the United States, despite of the fact that they took an active part in the negotiation of the text of this treaty, have not ratified it yet and it is hardly probable that they would do so in the near future. Therefore, the only mechanism how the United States could be bound by the principles of this Treaty would be their character as customary international law. It has to be said, however, that only few rules of the Moon Treaty represent customary international law fulfilling both the conditions of *usus longaevus* and *opinio iuris* and even fewer relate to the exploitation of the moon resources.

This “positive” evaluation seems to concern the regime of the samples from the moon: Only between 1969 and 1972, the Apollo missions brought back more than 300 kg of moon samples; in addition, three

would not bring any of their activities under the doubts of international law.

CONCLUSION

The plans to exploit the moon resources embodied in the speech of U.S. president Bush of January 2004 have brought a new input in the discussions on the future of the regime of lunar natural resources. Unfortunately, the plans as announced do not provide for many details of their implementation and, thus, do not allow for an in-depth assessment of the pertinent legal basis.

The scarcity of information does not mean that these activities necessarily shall interfere with the rules of international law: According to the Outer Space Treaty, the use of the moon is free provided that certain conditions are met. In the context of the planned activities, it means that the envisaged exploitation of lunar natural resources would have to be carried out without any appropriation of the exploited area, any occupation of the moon being unambiguously prohibited by the Outer Space Treaty. Moreover, these areas would have to be accessible to subjects from other States Parties to the Treaty, without the necessity of the fulfilment of the conditions of reciprocity and advanced notice required for the visits of the stations

and other installations.

Concerning the applicability of the Moon Treaty to the potential realisation of the U.S. plans, it has to be said that only the few rules of customary international law which are part of it can be taken into account. As concerns the exploitation of lunar natural resources, the regime of collection and disposal of space samples can be relevant, since it fulfils in a satisfactory way both conditions for customary rules to come into existence. It does not seem, however, that the collecting of samples should be the central point of the envisaged lunar activities: The rhetoric of the program indicates that they should go far beyond this scale and leave the framework of purely scientific interests which are the conditions for this form of use of outer space: The envisaged activities should serve practical purposes enabling sustainable life on the moon and making expeditions to other parts of outer space more likely.

This does not mean, either, that these activities would be prohibited by international law. It only seems to prove how necessary it is to establish a transparent and reliable international regime of the exploitation of lunar natural resources. As the solemnly proclaimed program has indicated, the time could have come when the exploitation of lunar resources becomes "feasible" in the

wording of the Moon Treaty and, consequently, the establishing of such regime should be undertaken. It is to be expected that it should be in the very interests of those who shall participate in

this program to have such rules in place which would exclude any potential doubts as to the compatibility of the activities concerned with the applicable provisions of international law.

¹ Agreement Governing the Activities of States on the Moon and Other Celestial Bodies, 11 July 1984, 1363 UNTS 3.

² U.N.G.A. Res. 49/34, of 9.12.1994, para 42.

³ Report of the Committee on the Peaceful Uses of Outer Space, 49 G.A.O.R. Supp. (No. 20) at para. 153, U.N. Doc. A/49/20, 1994.

⁴ President Bush's Vision for U.S. Space Exploration, <http://www.whitehouse.gov/infocus/space/vision.html>.

⁵ NASA Guiding Principles for Exploration: The Vision for Space Exploration, 2004, p. 17.

⁶ *Ibid.*, p. 3.

⁷ *Ibid.*

⁸ *Ibid.*, p. 19.

⁹ [Http://www.nasa.gov/missions/solar system/PICT_executive_order](http://www.nasa.gov/missions/solar_system/PICT_executive_order), January 30, 2004.

¹⁰ Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies. 10 October 1967, 610 UNTS 205.

¹¹ See *Carl Q. Cristol*, The 1979 Moon Agreement: Where is it Today? *Journal of Space Law* 27(1999), p. 1 ff.

¹² Status of International Agreements Relating to Activities in Outer Space as at 1 January 2004, in: United Nations Treaties and Principles on Outer Space, addendum.

¹³ On this question see by *Bin Cheng*, *Studies in International Space Law*, 1997, p. 358.

¹⁴ On the notion of „common heritage of mankind“ see e.g. *Rüdiger Wolfrum*, *Common Heritage of Mankind*, *Encyclopedia of Public International Law*, 1989, p. 65 ff.

¹⁵ A/AC.105/L.71 and Corr. 1.

¹⁶ *Supra* note 14.

¹⁷ On drafting of the Moon Treaty see *Nandasiri Jasentuliyana*, *International Space Law and United Nations*, p. 224 ff.

¹⁸ E.g. *Carl Q. Cristol*, p. 31 ff.; *Bin Cheng*, *supra* note 15; *Stephen E. Doyle*, *Using Extraterritorial Resources under the Moon Agreement on 1979*, *Journal of Space Law*, 26(1998), p. 111 ff.; *Stephen Gorove*, *Space Resources and the Developing Nations; A Legal Assessment*, in: Edward J. Pałyga (Ed.), *International Space Law Miscellanea*, 1995, p. 97 ff., *Nandasiri Jasentuliyana*, *International Space Law and United Nations*, *Vladimir Kopal*, *Progressive Development of Space Law and Concept of Common Heritage of Mankind*, in: Edward J. Pałyga (Ed.), *International Space Law Miscellanea*, 1995, p. 107 ff.

¹⁹ S. e.g. the Session „The Legal Status of Property Rights on the Moon and Other Celestial Bodies“ of the 39th Colloquiums on the Law of Outer Space in Beijing, 1996, as well as the IISL/ECSL Space Law Symposium 2004: „New Developments and the Legal Framework

covering the Exploitation of the Resources of the Moon“, Report of *T. Masson-Zwaan*, <http://www-iafastro.iisl.com>.

²⁰ *Bin Cheng*, *supra* note 15,

²¹ E.g. *Carl Q. Cristol*, *The Moon Treaty and the Allocation of Resources*, in: *Annals of Air and Space Law*, XXII (1997), Part II, p. 39.

²² *Ibid.*, p. 40.

²³ *Aldo Armando Cocca*, *The Principles of the Common Heritage of Mankind“ as Applied to Natural Resources from Outer Space and Celestial Bodies*, *Proceedings of the Sixteenth Colloquium on the Law of Outer Space* 16(1974), p. 174 ff.; *idem*, *Property Rights on the Moon and Other Celestial Bodies*, *Proceedings of the 39th Colloquium on the Law of Outer Space*, p. 9 ff.; *V. S. Mani*, *The Common Heritage of Mankind, Implication for the Legal Status of Property Rights on the Moon and other Celestial Bodies*, *ibid.*, p. 31 ff.; *H. L. van Traa-Engemann*, *Clearness Regarding Property Rights on the Moon and Other Celestial Bodies*, *ibid.*, p. 43 ff.

²⁴ President Bush's Vision for U.S. Space Exploration, Version submitted by The White House, <http://www.whitehouse.gov/infocus/space/vision.html>.

²⁵ *Supra* note 5, p. 7 and 15.

²⁶ BBC News, Excerpts of Bush's Space speech, <http://newsvote.bbc.co.uk/mpapps/pagetools/print/news.bbc.co.uk>.

²⁷ Agreement Governing the Activities of States on the Moon and Other Celestial Bodies, 11. July 1984, 1363 UNTS 3.

²⁸ *Supra* note 5, p. 17.

²⁹ On the question of excluding territorial claims to the moon s. e.g. Statement of the Board of Directors of the IISL on Claims to Property Rights Regarding the Moon and other Celestial Bodies. http://www.iafastro-iisl.com/additional%20pages/Statement_Moon.htm.

³⁰ Lunar Samples, <http://www-curator.jsc.nasa.gov/curator/lunar/samples.htm>.

³¹ How to Request Lunar Samples, <http://www-curator.jsc.nasa.gov/curator/lunar/samreq/reqmenu.htm>.