

Discussing the Need for a Responsible Exploitation of Space Resources, Particularly in View of the Establishment of Permanent Human Settlements on Celestial Bodies: Implications for International Law

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Abstract

In recent years, the concept of ‘responsible behavior’ in the context of space activities has appeared more and more frequently on the international scene. Although everyone seems to agree on the need to behave ‘responsibly’ in space, the whole debate is far from being adequately defined. This paper suggests that ‘responsible behavior’ should also govern and delimit the exploitation and use of space resources. Responsible behavior in this respect will be defined by Article IX OST, in particular by the ‘due regard’ principle, the willingness of States to cooperate internationally but also to promote a sustainable use of these resources. Further, the prospect of permanent human space settlements will redirect the approaches (political-legal) to the issue of space resources, depending on the stance that these communities will take on this issue. The different possible scenarios may redefine what is considered ‘responsible’, with a corresponding impact on the relevant legal frameworks.

“‘Responsible behavior’ is nothing but norms or practices that are to be followed in the interests of the larger global community.”

– Rajeswari (Raji) Pillai Rajagopalan, Technical Advisor to the United Nations Group of Governmental Experts (GGE) on Prevention of Arms Race in Outer Space (PAROS) (July 2018-July 2019)

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1. Introduction

In recent years, the concept of ‘responsible behavior’ in the context of space activities has appeared more and more frequently in international policy texts, in statements by States before COPUOS as well as in institutional texts of the United Nations. General Assembly Resolution 75/36, adopted on 7 December 2020 (Reducing space threats through norms, rules and principles of responsible behaviors) clearly addressed this issue, encouraging States:

to study existing and potential threats and security risks to space systems, including those arising from actions, activities or systems in outer space or on Earth, characterize actions and activities that could be considered responsible, irresponsible or threatening and their potential impact on international security...¹

In accordance with the aforementioned definition of Rajagopalan, “‘Responsible behavior’ is nothing but norms or practices that are to be followed in the interests of the larger global community”. As approached here, but also as it has been used in the context of international politics (UN), both in relation to space activities and those taking place in cyberspace – although no specific definition is provided in this respect – the concept of ‘responsible behavior’ consists of an optimal shell of State conduct, of a political nature, which, however, to acquire a clear substance, needs to be ‘translated’ into the field of law. Beyond this, criteria for defining responsible behavior in the international sphere – in particular, in the space domain – should be sought.

This will be attempted below by approaching ‘responsible behavior’ in the context of space activities (I), before exploring how such conduct ideally manifests itself in the field of exploration, use and exploitation of space resources (II). Finally, legal issues are raised in relation to the specific situation of a ‘responsible’ use and exploitation of space resources in the presence of permanent human installations in outer space (III).

2. ‘Responsible Behavior’ in the Context of Outer Space Activities

2.1. In General: The Criterion of Compliance with Both Hard and Soft Law

Although everyone seems to agree on the need for a ‘responsible’ behavior in outer space, the whole debate is far from being adequately defined. A study

1 A/RES/75/36, Reducing space threats through norms, rules and principles of responsible behaviours, 7.12.2020, available in: <https://undocs.org/Home/Mobile?FinalSymbol=A%2FRES%2F75%2F36&Language=E&DeviceType=Desktop&LangRequested=False>.

by the Rand Corporation in 2021² identified specific ‘key problem areas’ in this respect, specifically: space situational awareness (SSA) and space traffic management (STM); debris mitigation; anti-satellite (ASAT) testing; rendezvous and proximity operations (RPOs); and conflation of safety and security.

It is worth noting that, in discussing ‘responsible behavior’, this study considers that ‘The five treaties – particularly the OST – incorporate operative language that is vague and ambiguous and lends itself to arbitrary application by the signatory states’³ and thus ‘norms for responsible space behavior are needed’.⁴ In this respect, the study provides that:

leaders should focus on paths to space norms that: increase communication and engagement; increase transparency for all; begin with quickly achievable demonstrations of progress and accountability...; concentrate on safety before including security considerations; progress toward security agreements.⁵

It is further noted that:

Existing and emerging best practices, guidelines, and standards need to include a method for measuring compliance that accrues a benefit to entities that comply and some cost to those that do not.⁶

It is clear from the above, that the concept of ‘responsible’ behavior in space activities is political in nature and has a sense if it is accepted that the current international legal framework in space (the ‘hard law’, the five treaties) cannot respond with absolute adequacy to the new space age realities. If this is the case, then ‘responsible’ is called upon to act as a substitute for ‘lawful’ when the latter seems not enough. Such a view is, of course, at first, strange: we are used to an approach to the international community in which it is sufficient that States fulfil their international obligations and respect international law. In such a context, the description of the conduct of a State in international relations as ‘responsible’ is in fact identified with only ‘legal’ conduct. To distinguish ‘responsible’ from ‘lawful’, the former must have a broader content. Responsible behavior must be assessed based on criteria that go beyond mere legal obligations. Thus, States that are considered

2 B. McClintock, K. Feistel, D.C. Ligor & K. O’Connor, Responsible Space Behavior for the New Space Era: Preserving the Province of Humanity, Rand Corporation, 2021, available in: <https://www.rand.org/pubs/perspectives/PEA887-2.html> (hereinafter: “Rand Study”).

3 Rand study, p. 24.

4 Rand study, p. 25.

5 Rand study, p. 25-26.

6 Rand study, p. 30.

‘responsible’ are those that apply both hard law and soft law principles and norms, even though they are formally under no such obligation. In such a context, existing ‘soft law’ acquires a quasi-binding character, since it will also depend on the observance of norms, practices, etc. how ‘responsible’ a State positions itself in the space domain.⁷

The 2020 US National Space Policy takes a more inclusive approach to ‘responsible’ behavior and appears to reflect the same:

It is the shared interest of all nations to act responsibly in space to ensure the safety, stability, security, and long-term sustainability of space activities. Responsible space actors operate with openness, transparency, and predictability to maintain the benefits of space for all humanity.⁸

2.2. The Challenge of the Concept

The concept of responsible behavior of States has, however, faced strong opposition. During the Thematic Discussion on Outer Space: Disarmament Aspects in the First Committee of the 77th Session of the U.N. General Assembly on October 26, 2022, Russia expressed its disagreement, stressing that, with such concepts, ‘we confirm our concern that the adoption of certain measures that de facto introduce new rules for the use of outer space, when there is no universal legal regime of international treaties on PAROS, will be counterproductive’ – and, further, by raising issues like:

who and on the basis of what criteria will determine the degree of responsibility of states. We see in this approach the risks of politicization and subjective judgments of a manipulative nature in the interests of a certain group of states.⁹

China, Iran, and Venezuela echoed Russian criticism.

2.3. Extending the Concept to All Space Activities

However, if the concept of responsible behavior of States is to be retained in international space relations, as it describes a standard of international behavior that goes beyond – albeit inclusive of – what is internationally

7 See, in this respect, the US proposal that “States should promote compliance with international law *and adherence to voluntary guidelines and standards applicable to space activities*” (emphasis added) – Proposals of the United States of America Regarding Responsible State Behavior for Outer Space Activities, A/AC.294/2023/WP.5, 26 January 2023.

8 White House, “The National Space Policy,” memorandum, Washington, D.C., December 9, 2020, p. 3.

9 See R.P. Rajagopalan, “Defining ‘Responsible Behavior’ in Space Is a Growing Necessity”, The Diplomat, 7.9.2023, available in: <https://thediplomat.com/authors/rajeswari-pillai-rajagopalan/>.

lawful, there seems to be no reason to exclude a further extension of the need for ‘responsible behavior’ to ALL space activities. Modern activities in the space domain require a significant improvement in the behavior of all types of actors involved (governmental or non-governmental): As has been rightly observed, ‘outer space is becoming a crowded field with a growing number of space-faring countries, private sector interest, and competition between global powers’.¹⁰ This statement underlines the fundamental problems of present-day space activities: The growing threat of collision hazards; and the interdependence of actors in the space environment,¹¹ given that space environment becomes increasingly ‘congested, contested and competitive’.¹² Consequently, the interaction between, on the one hand, the current state of affairs in outer space and, on the other hand, the constant call, in international relations, for the reduction of tensions, the prohibition of the use of force in international relations¹³ and the obligation of a peaceful settlement of international disputes¹⁴ in order to maintain international peace and security,¹⁵ makes the element of ‘responsibility’ in the behavior of States an indispensable parameter. UNGA Resolution 76/231 emphasized the need for States to act responsibly in their space affairs in order to address threats related to space activities, and the General Assembly decided to convene an open-ended working group (OEWG):

...To take stock of the existing international legal and other normative frameworks concerning threats arising from State behaviours with respect to outer space; (b) To consider current and future threats by States to space systems, and actions, activities and omissions that could be considered irresponsible; (c) To make recommendations on possible norms, rules and principles of responsible behaviours relating to threats by States to space systems, including, as appropriate, how they would contribute to the negotiation of legally binding instruments, including on the prevention of an arms race in outer space.¹⁶

10 Beyza Unal, ‘Responsible behaviour in outer space protects everyone’, 5 March 2021, <https://www.chathamhouse.org/2021/03/responsible-behaviour-outer-space-protects-everyone>.

11 G. Kyriakopoulos, ‘Multilateralism in outer space: Reflections on the definition of a legal framework for space traffic management’, in: K. Yfantis, M. Sarigiannidis & D. Akrivoulis (Eds.), *War and Peace – Honorary Volume of Kostas Hadjikonstantinou*, I. Sideris, 2022, p. 597-608.

12 Sixty-eighth General Assembly, First Committee, 17th Meeting (AM), 25 October 2013, General AssemblyGA/DIS/3487.

13 UN Charter, Art. 2 (4).

14 UN Charter, Art. 33 and Chapter VI.

15 UN Charter, Art. 1 (1).

16 A/RES/76/231, Reducing space threats through norms, rules and principles of responsible behaviours, 24.12.2021, available in: <https://undocs.org/Home/>

The language used in this Resolution is general enough to apply to all space activities, raising the issue of ‘responsible’ behavior by States in the specific area of space resource use and exploitation.

2.4. Responsible Behavior in the Context of Cyber-Activities

In addition to the space sector, the issue of responsible behavior in cyberspace has been raised internationally with great urgency. Within the UN Office for Disarmament Affairs, the issue of cybersecurity was addressed by successive Groups of Governmental Experts (GGEs), whose mission was to examine existing and potential cyber threats and propose cooperative measures to address them. In this respect, the 2015 Group of Governmental Experts ‘on Developments in the Field of Information and Telecommunications in the Context of International Security’ issued an important report, which referred, *inter alia*, to ‘Norms, rules and principles for the responsible behaviour of States’.¹⁷ As this report points out,

Voluntary, non-binding norms of responsible State behavior can reduce risks to international peace, security and stability. Accordingly, norms do not seek to limit or prohibit action that is otherwise consistent with international law. Norms reflect the expectations of the international community, set standards for responsible State behavior and allow the international community to assess the activities and intentions of States. Norms can help to prevent conflict in the ICT environment and contribute to its peaceful use to enable the full realization of ICTs to increase global social and economic development.¹⁸

The report refers to existing norms, such as, *inter alia*, that ‘States should not knowingly allow their territory to be used for internationally wrongful acts using ICTs;’, but also notes that ‘Given the unique attributes of ICTs, additional norms could be developed over time’.¹⁹

Mobile?FinalSymbol=A%2Fres%2F76%2F231&Language=E&DeviceType=Desktop
&LangRequested=False.

17 See H. Moynihan, “The vital role of international law in the framework for responsible state behaviour in cyberspace”, Journal of Cyber Policy, Published online: 29 Oct. 2020, DOI:10.1080/23738871.2020.1832550. p. 14; S. Dominioni & G. Persi Paoli, “Unpacking Cyber Capacity-Building Needs: Part I: Mapping the Foundation Cyber Capabilities”, Geneva, UNIDIR.

18 Report of the Group of Governmental Experts on Developments in the Field of Information and Telecommunications in the Context of International Security, General Assembly, 70th Session, Developments in the field of information and telecommunications in the context of international security, 22 July 2015, A/70/174, p. 7.

19 A/70/174, p. 8. See also A/RES/75/240 (2020) – Developments in the field of information and telecommunications in the context of international security, 31.12.2020, available in: <https://undocs.org/Home/Mobile?FinalSymbol=A%2FRES%2F75%2F240&Language=E&DeviceType=Desktop&LangRequested=False>.

Further, in the context of the so-called ‘Lucca Declaration’, the G7 States expressed their concern ‘about the risk of escalation and retaliation in cyberspace’ and recognized ‘the urgent necessity of increased international cooperation to promote security and stability in cyberspace’, ‘in the interest of conflict prevention and peaceful settlement of disputes’.²⁰ In this context, and for these purposes, the resolution proposes a set of voluntary, non-binding norms, on the basis of which one can distinguish the need for international cooperation and exchange of information, the fulfilment of the international obligations of States, but also the old, fundamental principle of international law, as emphasized by the International Court of Justice, that ‘States should not knowingly allow their territory to be used for internationally wrongful acts using ICTs’.²¹ These norms are largely in line with those of the 2015 GGE report.

The aforementioned developments confirm the usefulness of the concept of ‘responsible behavior’ in today’s international relations, especially in cutting-edge environments (such as outer space and cyberspace) where international law still exists at the level of principles, without detailed *ad hoc* rules, and where, contrary to what usually happens, the development of legal rules is required even before the manifestation of relevant practices – as for example in the issue of space resources (as well as with respect to the applicable international norms to cyberspace).

3. ‘Responsible Behavior’ in Relation to the Exploration, Utilization and Exploitation of Space Resources

This paper argues that the ‘responsible behavior’ factor, once accepted internationally, should also govern and delimit the exploitation and use of space resources – both *in situ*, to enable and facilitate further space exploration, but also for commercial purposes. Based on this premise, the necessary legal parameters for its implementation will be sought, mainly in the context of international law, in view of its application in outer space, in accordance with Article III OST.

²⁰ Idem.

²¹ ICJ, Corfu Channel case, Judgment of April 9th, 1949, I.C.J. Reports 1949, p. 4, at 22.

3.1. Responsible Behavior and the Due Regard Principle

What is the legal basis for ‘responsible’ behavior – both in relation to the issue of space resources and, in a broader sense, in relation to space activities as a whole? At a first level, reference is made to Article IX²² of the Outer Space Treaty of 1967,²³ which states that:

Article IX

In the exploration and use of outer space, including the Moon and other celestial bodies, States Parties to the Treaty shall be guided by the principle of co-operation and mutual assistance and shall conduct all their activities in outer space, including the Moon and other celestial bodies, with due regard to the corresponding interests of all other States Parties to the Treaty... If a State Party to the Treaty has reason to believe that an activity or experiment planned by it or its nationals in outer space, including the Moon and other celestial bodies, would cause potentially harmful interference with activities of other States Parties in the peaceful exploration and use of outer space, including the Moon and other celestial bodies, it shall undertake appropriate international consultations before proceeding with any such activity or experiment...

In Article IX, the due regard concept is a core obligation and, thus, should be considered a fundamental criterion for assessing conduct as ‘responsible’. In today’s international relations, ‘due regard’ as set out in Article IX OST functions as a necessary limit to States’ aspirations. The ‘due regard’ that each State must show in its international relations in order not to violate the rights of other States has been, and continues to be, a concern at every stage of the development of international law. The obligation of ‘due regard’ is essentially aimed at balancing the rights and interests of States in such a way that the exercise of those rights (and the expression of those interests) does not cause harm to other States.

In essence, ‘due regard’ refers to the prohibition of abuse of rights and the principle of good faith. While ‘due regard’ is the positive expression of the State’s behavior and action required by international law (what a State should do/how a State should act), the prohibition of abuse of rights is the negative expression (what a State should not do / how a State should not act).

22 See, in this respect, O.S. Stelmakh, “Global Space Governance for Ensuring Responsible Use of Outer Space, Its Sustainability and Environmental Security: Legal Perspective”, *Proceedings of the International Institute of Space Law*, Vol. 58, 2015, p. 686.

23 Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies, adopted on 19 December 1966, opened for signature on 27 January 1967, entered into force on 10 October 1967, 610/U.N.T.S./205 (hereinafter “Outer Space Treaty” or “OST”).

Nevertheless, both concepts require and encourage State behavior of a preventive nature: The purpose of both is to avoid harm – and generally negative effects – on the rights of other States.²⁴ In the judgment of the International Court of Justice in the *Corfu Channel* case, Albania's failure to show 'due regard' (although the term is not explicitly used in the text of the judgment) was the reason why the destruction of the British warships could not be prevented: 'In fact, nothing was done by the Albanian authorities to prevent the disaster. These grave omissions involve the international responsibility of Albania'.²⁵ Further, in the case of the *Gabčíkovo-Nagymaros* project, the need for prevention through demonstration of 'due regard' was reiterated by the International Court in relation to the problem of transboundary environmental damage.²⁶ Last but not least, 'due regard' is also related to the principle of good faith through its affinity with abuse of rights, since abuse of rights is a more specific expression of this principle.²⁷ Founded as such in international law, the due regard principle, contained in Article IX OST, constitutes a fundamental element of 'responsible' conduct. States can demonstrate 'responsible' behavior by taking into account the actions of other States when planning and carrying out space activities. In this respect, it is important to note that fulfilment of the relevant international obligation (due regard) requires international cooperation between States and promotes multilateralism in international relations. On the contrary, unilateral actions and rationales that do not derive from existing international law (whatever it may be at any given time) will lead to 'irresponsible' practices, as they can cause friction in relations between States and even endanger international peace and security.

3.2. Respect for the 'Rules of the Game'

It follows that behavior in the context of the exploitation of space resources in general will be considered 'responsible' if it respects the applicable rules of international and space law (whether 'hard' or 'soft'). Indeed, it should be repeated that, in this respect – i.e. assessing how 'responsible' a given behavior is – adherence to soft law principles is necessary, despite their non-mandatory nature, because it demonstrates the willingness of the State concerned to act internationally within agreed principles and frameworks

24 "The duty obliges states to take all reasonable measures to prevent the occurrence of the harmful outcome" – E. ASKIN, "Due Diligence Obligation in Times of Crisis: A Reflection by the Example of International Arms Transfers", *EJIL: Talk!*, 1 March 2017, in: <https://www.ejiltalk.org/due-diligence-obligation-in-times-of-crisis-a-reflection-by-the-example-of-international-arms-transfers/>.

25 ICJ, *Corfu Channel Case*, Judgment of April 9th, 1949: *I.C.J. Reports* 1949, p. 23.

26 ICJ, *Gabčíkovo-Nagymaros Project* (Hungary v. Slovakia), Judgment of 25 September 1997, *I.C.J. Reports* 1997, para. 140.

27 Bin Cheng, *General Principles of Law as Applied by International Courts and Tribunals*, Cambridge University Press, 1953 (reprint 2006), p. 121.

and, in general, its choice to act ‘collectively’ in its international relations.²⁸ Thus, soft law principles and guidelines become more or less ‘binding’, since any action contrary to them could be considered ‘irresponsible’ under certain conditions (causing damage to other States/parties).

In addition, responsible behavior should be dynamic and include the prospect of adopting new rules to strengthen the existing legal framework, whether hard or soft. The OEWG Draft Report’s findings, although not final due to the absence of consensus, suggest this direction, referring, *inter alia*, to:

- Compliance with the existing law applicable in outer space, including treaties, both bilateral and multilateral as well as customary international law;
- Existing legal framework applicable to outer space by itself is not sufficient and may be strengthened to address threats to space systems;
- Availability of the consultation mechanism provided by article IX OST;
- Importance of the duty of ‘due regard’;
- Applicability of Art. 2(4) of the UN Charter in outer space.²⁹

It is evident from the above that, when it comes to space resources, promoting international cooperation is an additional criterion for justifying behavior as ‘responsible’, in addition to the general requirement of complying with ‘hard’ rules and ‘soft’ norms, with the due regard principle being a key tool.

3.3. A ‘Responsible’ Behavior Must Necessarily Lead to a Sustainable Use of Space Resources

Sustainable development requires an integrated approach that takes into consideration environmental concerns along with economic development. In 1987, the United Nations Brundtland Commission defined sustainability as ‘meeting the needs of the present without compromising the ability of future generations to meet their own needs’.³⁰ Sustainable development is currently a key objective of the United Nations, promoted through the so-called 2030 Agenda for Sustainable Development, and the progressive implementation of 17 Sustainable Development Goals, which address key international priorities

²⁸ See Stelmakh, *op. cit.*, p. 686.

²⁹ Draft report of the Open-ended working group on reducing space threats through norms, rules and principles of responsible behaviours, A/AC.294/2023/CRP.1/Rev.1, 31 August 2023, available in: <https://meetings.unoda.org/meeting/57866/documents>.

³⁰ See <https://www.un.org/en/academic-impact/sustainability>.

such as poverty, health, education, inequality, economic growth, climate change, etc.³¹

A key document in this process is the report of the UN Secretary-General ‘Our Common Agenda’ (2021) – in fact, ‘an agenda of action designed to accelerate the implementation of existing agreements, including the Sustainable Development Goals’.³²

In said report, the UN Secretary-General, inter alia stressed:

- the importance of solidarity, describing it as ‘a fundamental value by virtue of which global challenges must be managed in a way that distributes costs and burdens fairly, in accordance with basic principles of equity and social justice...’;³³
- the need to protect the global commons (‘the four conventionally understood commons that are beyond national jurisdiction – the high seas, the atmosphere, Antarctica and outer space – all of which are now in crisis’) and called for stronger governance of them;³⁴
- that the use of outer space should be peaceful, secure and sustainable and that ‘a combination of binding and non-binding norms is needed, building on existing frameworks and drawing in the full range of actors now involved in space exploration and use’.³⁵

It follows that the need for sustainability inevitably expands the notion of ‘responsible’ behavior: it requires respect for the ‘interests of the wider global community’ not only at a given moment in time, but also over time.

In the context of space activities, the main issue of sustainability is to ensure that current activities (by the developed, space faring States) do not prevent or reduce the future use of outer space (by the developing States). Furthermore, sustainability in space depends on, and must be considered

31 This was preceded by the adoption of Agenda 21 (by the Earth Summit, Rio de Janeiro, Brazil, in June 1992), the unanimous adoption of the Millennium Declaration and of the 8 Millennium Development Goals (MDGs, in September 2000, by the Millennium Summit, New York), the Johannesburg Declaration on Sustainable Development (by the World Summit on Sustainable Development, in 2002) as well as the adoption of the document “The Future We Want” [June 2012, United Nations Conference on Sustainable Development (Rio+20), Rio de Janeiro, Brazil], that called for the negotiation and adoption of the Sustainable Development Goals – see https://www.sd-commission.org.uk/pages/history_sd.html; <https://www.undp.org/sdg-accelerator/background-goals>.”

32 United Nations, *Our Common Agenda* – Report of the Secretary-General, New York, 2021, available in: <https://www.un.org/en/content/common-agenda-report/#download> (hereinafter: “Our Common Agenda”), p. 3.

33 *Our Common Agenda*, 14.

34 *Our Common Agenda*, 48.

35 *Our Common Agenda*, 61-62.

from, two different and equally critical perspectives: to preserve sustainability in space – to preserve sustainability on the Earth.

The importance of space and space applications in general for sustainable development and the achievement of the Sustainable Development Goals is recognized in key UN General Assembly resolutions: The General Assembly, in its resolution 73/6 of 26 October 2018, referred to:

...strengthening international cooperation in the exploration and peaceful uses of outer space, in which space was seen as a major driver of and contributor to the achievement of the Sustainable Development Goals for the benefit of all countries.³⁶

In this respect, the General Assembly invited UNCOPUOS to continue to develop a ‘Space2030’ Agenda and implementation plan. Said Agenda defines a set of ‘overarching objectives’, the 4th of which refers to ‘Build partnerships and strengthen international cooperation in the peaceful uses of outer space and in the global governance of outer space activities’.

Some years ago (2016), the Dubai Declaration, adopted at the first High Level Forum (Space as a driver for socio-economic sustainable development, Dubai, United Arab Emirates, 24 November 2016) declared four ‘High Level Forum pillars’ for the Space2030 Agenda. The 4th, among them (space diplomacy), also stressed the importance of ‘building partnerships and strengthening international cooperation in space activities’.³⁷ Therefore, international cooperation is a key requirement for defining behavior as ‘responsible’, also in the context of promoting sustainable development in the context of space activities, and is proposed as a *conditio sine qua non*.

It is interesting to note that the UN Secretary-General, in his *Policy Brief on Outer Space: Our Common Agenda Policy Brief 7 For All Humanity – the Future of Outer Space Governance* (May 2023), in highlighting this interaction between the use of space resources and sustainability, stressed the need to:

develop an effective framework for sustainable exploration, exploitation and utilization of the Moon and other celestial bodies. This framework could include binding and non-legally binding aspects and should build upon the five United Nations treaties on outer space and other instruments for international cooperation in the peaceful uses of outer space.

36 See A/RES/76/3, The “Space2030” Agenda: space as a driver of sustainable development, 25 October 2021, available in: https://www.unoosa.org/oosa/oosadoc/data/resolutions/2021/general_assembly_76th_session/ares763.html.

37 Available in: https://www.unoosa.org/documents/pdf/hlf/1st_hlf_Dubai/Dubai_Declaration.pdf.

Here, there is a clear emphasis on ensuring compliance with binding and non-binding rules and on promoting international cooperation to ensure a sustainable use and exploitation of space resources.

4. 'Responsible' Exploitation of Space Resources on Celestial Bodies with Permanent Human Settlements

The relevant analysis, however, will further consider the now emerging prospect of permanent human settlements on celestial bodies. It is obvious that the establishment of 'space communities', if it does take place, will inevitably redirect the approaches (both political and legal) to the issue of space resources, depending on the stance that these communities will take on this issue. In particular:

As much as the 'responsible' exploitation and use of planetary resources in general is a matter of concern, as already developed, this issue takes on new dimensions when the general management of space resources concerns planets with permanent human settlements.

In such a case, which is certainly a reasonably foreseeable prospect, several issues will need to be addressed.

Scenario #1: The human settlement on the planet decides to maintain relations with a particular State on Earth, of which it is considered an (extra-terrestrial) extension, without, however, raising the question of establishing a space 'colony' in the sense that this term was used in the past.³⁸ In such a case, the earthly 'centre', in order to function 'responsibly', would have to operate at least, and subject to what has already been developed, in some kind of coordination with the extra-terrestrial settlement, in order to respect the rights and needs of the settlers on the celestial body. This is a particularly difficult case, unprecedented and unparalleled in many respects, including the legal ones.

Scenario #2: The settlement (on the Moon, Mars or on another celestial body) decides to become autonomous and independent from its metropolis on Earth. In such a case, the extra-terrestrial settlement would be entitled to claim the management and exploitation of the celestial body's resources for itself, to the exclusion of Earth-based claimants, based on the principle of permanent sovereignty over natural resources.³⁹ However, it should be borne in mind that the obligation to use and exploit resources 'responsibly' still applies, but now in a completely different context (exploitation by the alien community *per se*)

38 G. Kyriakopoulos, "Colonies on the Moon (and/or Mars)? New Challenges for International and National Law", Proceedings of the IISL, 2020, p. 169-181.

39 Kyriakopoulos, "Colonies on the Moon...", op. cit.

Consequently, such perspectives may qualitatively redefine what is considered ‘responsible’, with a corresponding impact on the relevant legal frameworks. However, it must be borne in mind that, even in the context of these unprecedented situations, ‘responsible’ behavior by States (or at least by autonomous space communities) will be defined not only by respect for international law, but also by adherence to even non-mandatory practices, international consultation and cooperation, and the need for sustainable use and exploitation of space resources, regardless of who does it and under what legal regime.