

The Need for a Common Heritage of Mankind Based regime for the Exploitation of Outer Space Resources:

The Deep Seabed as inspiration for Outer Space

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Abbreviations

UN	United Nations
UNGA	United Nations General Assembly
UNCOPUOS	United Nations Committee on the Peaceful Uses of Outer Space
OST	Outer Space Treaty
CHM	Common Heritage of Mankind
UNCLOS	United Nations Convention on the Law of the Sea
ISA	International Seabed Authority
ITLOS	International Tribunal for the Law of the Sea
VCLT	Vienna Convention on the Law of Treaties

1 Introduction

1.1 Research Question/background

This thesis analyses the way in which the legal regime covering the exploitation of resources in the Deep Seabed could serve as an inspiration to the one needed in Outer Space, as both are strongly influenced by the Common Heritage of Mankind principle.

In the following work, the term 'Outer Space' will be used to describe the zone comprising 'the solar system within the universe, starting at least 110km above sea level¹.

Additionally, the term Deep Seabed will be used to describe the area under the area of the seafloor located beyond continental shelves, as Art. 1(1) UNCLOS describe as 'the seabed and ocean floor and subsoil thereof beyond the limits of national jurisdiction'.

As the exhaustion of resources becomes a growing concern on earth, States and private entities are more and more attracted to the rich potential of Outer Space, and the bodies it contains, in terms of Minerals and Water.

Indeed, there are more than 18000 Near-Earth Asteroids containing high amounts of highly valued metals such as platinum, nickel, etc³.

Additionally, the Moon holds significant amounts Helium-3⁴, considered to have a potential of replacing fossil fuels as the primary source of energy on earth⁵; and of water, that, if exploited, could lead to thousand-years worth of rocket fuel. This makes the Moon an interesting option for establishing a space-mining base in Outer Space. Such a first step to create a space-mining economy could be achieved within a decade⁶.

Such a short-term prediction illustrates the compelling character of this thesis subject.

Indeed, the possibility of such activities has sparked debate inside the international community and the legal community⁷. Indeed, the current international space law legislation was established in the early second half of the 20th century. As Outer Space activities were way underdeveloped compared to today, the principles established were broad and general. As of today, they

¹ Hobe, S. (2019) Space Law, Baden-Baden, Nomos Verlagsgesellschaft, p. 14.

³ Asteroid Mining: US Company Looks to Space for Precious Metal, *The Guardian*, London, 23 January 2013.

⁴ Neal C.R., *The Moon 35 years after Apollo: What's left to learn?*, 69 *Chemie der Erde* (2009), 21.

⁵ Reinke N., No Helium-3 from Moon – Commentary on the Current Moon Debate, *DLR Countdown 03/07*, 24.

⁶ Wall M., Asteroid Mining May be a Reality by 2025, *Space.com*, 11 August 2015.

⁷ Legal aspects of space resources utilization, Tronchetti F. In: Von Der Dunk F. (2015), *Handbook of Space Law*, Chetelham, United Kingdom, Edward Elgar Publishing, p. 769.

show a lack of certainty about the possibility of exploitation of space resources, the legal status of such resources, and the modalities of such exploitation.

Such uncertainty is doubly penalizing, as it may discourage private entities from investing in the development of such activities, and may also lead states to enact domestic legislation allowing and regulating them unilaterally. This would potentially lead to a race to space resources that will exclude states without the adequate technical and financial resources to exploit them⁸.

A solution to these issues implies the establishment of an International Space Law regime that would adequately cover the exploitation of Outer Space resources.

However, such a regime needs not to be developed *ex nihilo*. Indeed, Outer Space being an international area of *res communis* status, inspiration could be sought from other regimes governing zones of similar status.

To this aim, the Deep Seabed presents the most complete and adequate characteristics. Therefore, through this thesis, will be reviewed why and how the Deep Seabed regime could influence the development of an Outer Space regime governing the exploitation of its resources.

This leading us to the problematic of this thesis:

In what way could the Deep Seabed regime serve as an inspiration to the establishment of an Outer Space mining regime based on the Common Heritage of Mankind principle? Subsequently, what would be the adaptations required by the specificity of Outer Space?

1.2 Sources and method

The argumentation developed through this thesis is based on different legal instruments as referred to in Art. 38, para 1 of the ICJ Statute⁹, establishing that the primary sources¹⁰ of International Law are international conventions, international customary law, and the general principles of international law, followed by jurisprudence and doctrine as subsidiary sources. Additionally, will be considered national legislation from different states, as they also have an impact on the making of International Law.

⁸ Ibid.

⁹ Statute of the International Court of Justice, 33 UNTS 933, adopted on the 26th of June 1945, entered into force on the 24th of October 1945.

¹⁰ *Outer Space Treaty*, Ibid, Art 38.

Included in the analysis of these legal instruments are the analysis of their interpretation. As most of the International Space Law instruments employ loose terms and principles, their interpretation is of crucial importance as to the establishment of a future regime covering the exploitation of Outer Space resources.

Following this, their dispositions will be interpreted following the interpretation principles established in Art. 31 and Art. 32 of the VCLT¹¹. This meaning that these dispositions will be interpreted through, first, a consideration of the ordinary meaning of the words, second a consideration of the *Travaux préparatoires*, in order to determine the intended meaning during negotiations, and finally an interpretation harmonious with the rest of the terms of the treaty¹², and its aim.

Indeed, the core of the process, leading to answers to this thesis' question, relies on the description and interpretation of these instruments and the mechanisms they establish.

Additionally, it will be referred to the work of scholars, through books and articles. Indeed, the development of the Deep Seabed and Outer Space legal regimes include historical and political aspects going beyond what can be found in international legal instruments. Therefore, these works will help us understand how to interpret and articulate such legal instruments.

The actual development of International Outer Space law takes various forms, as it was established through international instruments, UNGA resolutions; but also benefits from diverse state practice and legislation, without forgetting the doctrine's role, and the international legal work conducted under the auspices UNCOPUOS or the International Institute of Space Law. Therefore, it will be necessary to review it in further details later in this thesis.

¹¹ United Nations, Vienna Convention on the Law of Treaties, 23 May 1969, United Nations, Art. 31 & 32.

¹² Jakhu R.S. & Dempsey P.S., *Routledge Handbook of Space Law* (2016), London, Routledge, p. 13.

2 Comparing the Deep Seabed and Outer Space regimes

Through these parts will be compared the situations of the Deep Seabed and the Outer Space. Indeed, these two zones present similarities regarding their physical characteristics, their status, and the historical developments of the legal regimes covering them.

As an international regime covering the exploitation of Outer Space's natural resources is more and more necessary, comparing these two zones, in order to assess if the Deep Seabed's regime could be transposed to Outer Space, seems appropriate.

2.1 Two zones of similar status

These two zones are similar in term of status, resources, remoteness and legal principles applicable to them.

2.1.1 A similar territorial status

Theoretically, both areas belong to the categories of areas called '*res nullius*' or '*res communis*'. This means respectively an area that belongs to no states until a state effectively occupies it, or an area open to all states and allowing them to exploit its resources freely, as the High Seas are.

Through the *Fur Seals* case¹³, the parties developed positions consistent with the idea that the deep seabed was of *res nullius* status¹⁴. Still, this view is questionable as an effective occupation of the deep seabed is materially impossible.

Outer Space, by nature, is under the same situation. Indeed, it is materially impossible to occupy, but the celestial bodies in Outer Space could potentially be subject to occupation. Outer Spaces resources, especially those located on the celestial bodies, may be retrieved, even though such activities are still at an embryonal stage of development for now.

Beyond the status that could arise from their material characteristics, it is the ones consequent to the legal principles ruling these areas that should be considered. Indeed, both of them are ruled by the non-appropriation principle. It is explicit for Outer Space, thankfully to Art. II of

¹³ *Bering Sea Fur Seals (Great Britain v United States)*, 1893, Reports of International Arbitral Awards (1893), VOLUME XXVIII pp. 263-276

¹⁴ O'Connell D., *The International Law of the Sea*, vol. 1 (1982), Oxford, Clarendon Press, p. 454.

the Outer Space Treaty¹⁵ (OST), and implicitly through the Common Heritage of Mankind (CHM) principle as expressed through Art. 136, and 137 of the United Nations Convention on the Law of the Sea¹⁶ (UNCLOS).

Therefore, it can be considered that they both were legally attributed to the status of *res communis*, as most of the International Community adopted these Outer Space and Deep Seabed regimes.

2.1.2 Attractive Mining Potential

The Deep Seabed and Outer Space both present attractive potentials for mining resources. First, It is important to keep in mind that these mining activities are barely starting to be conducted in the Deep Seabed, and are barely being considered for Outer. Indeed they are, for now, technologically costly in the Deep Seabed and financially¹⁷ and technologically out of reach in Outer Space.

Nevertheless, certain zones in the Deep Seabed and Celestial Bodies (such as asteroids) show to be minerally rich enough to impulse the development of the mining industry toward their exploitation.

In the Deep Seabed, the resources attracting the most interest are metals. Three types of resources are currently covered by the exploitation regime established by the UNCLOS, under the authority of the ISA.

The first resource discovered, and the object of the majority of exploitation contracts granted by the ISA to this day¹⁸, are polymetallic nodules. These nodules contain a variety of metals such as nickel, copper, manganese and cobalt¹⁹.

The second resource exploitable found in the Deep Seabed are cobalt-rich ferromanganese crusts. There are found on and around volcanic seamounts, contain cobalt, manganese and nickel, and are estimated to cover 1.7% of the Ocean Floor²⁰.

¹⁵ Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and other Celestial Bodies, 610 UNTS 205, adopted on 27 January 1967, entered into force on 10 October 1967 (*Outer Space Treaty*).

¹⁶ UN GA, Convention on the Law of the Sea, adopted on the 10 December 1982, entered into force on 16 November 1994 (*UNCLOS*).

¹⁷ An Outer Space Mining venture was estimated to cost US\$100 billion in 1996. Lee, Ricky J., Law and regulation of commercial mining of minerals in outer space (2012), Dordrecht, Springer.

¹⁸ The list of all ongoing contracts, including the contractor's identity and the resource concerned can be found on the ISA website: https://www.isa.org.jm/deep-seabed-minerals-contractors?qt-contractors_tabs_alt=0#qt-contractors_tabs_alt.

¹⁹ ISA: <https://www.isa.org.jm/files/documents/EN/Brochures/ENG7.pdf>.

²⁰ ISA: <https://www.isa.org.jm/files/documents/EN/Brochures/ENG9.pdf>.

Finally, the third resource attracting mining interest are the deposits of polymetallic sulphides found around hydrothermal vents²¹ (interstices between tectonic plaques that absorb seawater before expelling it warm and full of minerals). Such expulsions then solidify and are estimated to be constituted of thousands of tons of such sulphides, which contain zinc, copper, gold and silver. This type of resource is considered more commercially attractive as it is the easiest to retrieve²².

Outer Space, through its celestial bodies, especially asteroids and the Moon, has recently been identified as a significant source of minerals, such as cobalt, nickel, gold and platinum.

A cartography process of these resources has already begun to take place under the impulse of entities such as Planetary Resources Inc. (American space mining corporation). It provides with general information about these asteroids, but also with an estimated dollar value of their resources, which illustrates the commercial potential of their exploitation.

Confirming these estimations, the bank Goldman Sachs estimated that an asteroid the size of a football field could contain from 25 to US\$50 billion worth of platinum²³.

2.1.3 Both are relying on the Common Heritage of Mankind principle

As it will be developed further in this thesis, it is of the utmost importance to note that the established legislation covering the Deep Seabed and Outer Space are both, more or less, built on the CHM principle.

Indeed, this principle was first evoked through Art. 11 of Moon Agreement²⁴, which reiterates Art. 1 of the OST, as it means that the use of Outer Space and its resources shall not exclusively benefit to specific states or groups of states.

On its side, the Deep Seabed regime was historically developed around this concept of CHM, and it is Established in Art. 136 UNCLOS, the first article of Part XI Section 2 establishing the principles governing the Area.

This principle is considered to have different implications applying to the area it governs. From what can be seen in the Deep Seabed, it implies that no state can claim sovereignty over any part of the area governed by the CHM, and leads to a specific regime of utilization based on international cooperation.

Indeed, it provides with an international management regime which establishes an international institution (the International Seabed Authority in the Deep Seabed) considered to be

²¹ ISA : <https://www.isa.org.jm/files/documents/EN/Brochures/ENG8.pdf>

²² Hoagland P., *Deep-sea mining of Seafloor Massive Sulfides* (2010), 34 *Marine Policy* 728, 729.

²³ Goldman Sachs, *Space – The Next Investment Frontier*, 4 April 2017.

²⁴ Agreement Governing the Activities of States on the Moon and Other Celestial Bodies, 1363 UNTS 3, adopted on 18 December 1979, entered into force on 11 July 1984 (*Moon Agreement*).

representing whole Mankind, and whose mission is to administer activities in the area it covers. Even though many authors hold that the establishment of such an institution is a necessary feature of the CHM principle²⁵, it was not reproduced (for now) in other areas such as Outer Space, Antarctica, or the regime concerning the utilization of geostationary orbits.

²⁵ Baslar K., *The Concept of the Common Heritage of Mankind in International Law* (1998), Martinus Nijhoff Publishers, the Hague.

2.2 Historical developments

After World War II, the international community felt to regulate the relations and interactions between states. Wanting to try the League of Nations experience again, and this time effectively, the international community established the United Nations.

Under the United Nations impulse, were regulated different sectors such as the international waters, the environment, or Outer Space. As we will, here, try to assess how the Deep Seabed regime could be adapted to Outer Space, it is, in my opinion, necessary to examine the historical development of these regimes. Notably, it will allow us to perceive how the CHM principle influenced them.

2.2.1 The apparition of Space Law

Through this part will be shown the path followed by Outer Space Law through its development. Indeed, as will be seen, it progressively went from hard law (understood as binding international instruments) to soft law (non-binding international acts).

2.2.1.1 Early writings and the start of the law-making process

Before WWII, space law had been envisaged by Vladimir Mandl ("Space Law: a problem of Space Flight", 1932), or Eugène Korovin²⁶. The latter called for states' cooperation in developing international legal principles relating to Outer Space. The topic was also discussed by many aviation lawyers such as Manfred Lachs, Alex Meyer or John Cobb Cooper.²⁷

After WWII, it became clear that the competition between the USA and the USSR could lead to conflict, and that potential military use of the Outer Space was also one of the reasons causing such a technological and achievements race between the two superpowers.

Additionally, it was clear that because Outer Space was a zone beyond states' sovereignty, specific international rules would be needed to address the particular characteristics and legal categorization of Outer Space²⁸.

Therefore, the need was felt in the United Nations to provide a legal framework regulating such activities.

²⁶ Korovin E., *La conquête de la stratosphère et le droit international*, Revue générale de Droit International Public, tome XLI (1934), pp. 675-686.

²⁷ Hobe, S. (2019) Space Law, Baden-Baden, Nomos Verlagsgesellschaft, p. 41.

²⁸ For BeFreeland S., *For better or for worse? The Use of Soft Law within the International Legal Regulation of Outer Space* (2011), 36 *Annals of Air and Space Law*, pp. 409-446.

With Resolution 1348 (XIII) of 13 December 1958²⁹, the UN created the United Nations Committee on the Peaceful Uses of Outer Space (UNCOPUOS). It was established as an *ad hoc* committee of the UN General Assembly. It became permanent thanks to Resolution 1472 (XIV) of 12 December 1959³⁰, and is the UN organ responsible for Outer Space matters. The UNCOPUOS is composed of two sub-committees: The Scientific and Technical Subcommittee, and the Legal Subcommittee. Today, it counts 95 member states³¹.

The UNCOPUOS is competent to elaborate all the Outer Space legislation. After it has adopted a text it has elaborated, it forwards it to the General Assembly for adoption. It also recommends the UNGA whether to adopt the text as a regular UNGA resolution or as an international agreement.

2.2.1.2 The three phases of Space Law-making

As we will consider their product further on, let us concentrate on the historical development of the three phases in which Outer Space law-making can be divided in.

The first phase expands from 1959 to 1979. It was highly proficient regarding Outer Space law-making, as it resulted in the adoption of five international agreements of a fundamental character: the Outer Space Treaty, the Rescue Agreement³², the Liability Convention³³, the Registration Convention³⁴, and the Moon Agreement³⁵.

These treaties, especially the OST and the Moon Agreement (in its content more than its effectivity, because of its low number of state parties), laid down the basis of Space Law. They posed the general principles meant to apply to Outer Space Law, such as the non-appropriation principle³⁶ or the Common Heritage of Mankind principle³⁷. The latter having then been reutilized in other areas of International Law.

²⁹ UNGA Res. 1348 (XII), Questions on the Peaceful Use of Outer Space, 13 December 1958.

³⁰ UNGA Res. 1472 (XIV), International Cooperation in the Peaceful Use of Outer Space, 12 December 1959.

³¹ UNGA Res. 7432, International Cooperation in the Peaceful Uses of Outer Space, 10 January 2020.

³² Agreement on the rescue of Astronauts, the Return of Astronauts and the Return of Objects Launched in Outer Space, 672 UNTS 119, adopted on 22 April 1968, entered into force on 3 December 1968.

³³ Convention on International Liability for Damages Caused by Space Objects, 961 UNTS 187, adopted on 29 March 1972, entered into force on 1 September 1972 (Liability Convention).

³⁴ Convention on the Registration of Objects Launched into Outer Space, 1023 UNTS 15, adopted on 14 January 1975, entered into force on 15 September 1976 (Registration Convention).

³⁵ Agreement Governing the Activities of States on the Moon and Other Celestial Bodies, 1363 UNTS 3, adopted on 18 December 1979, entered into force on 11 July 1984.

³⁶ Outer Space Treaty, Art. II.

³⁷ Moon Agreement, Art. 11 para. 1.

The second phase, lasting from 1982 to 1996, is characterized by the adoption of many General Assembly resolutions such as the Resolution on remote sensing by satellite³⁸ or the Resolution on Direct Television Broadcasting³⁹. The switch from International Agreements to UNGA resolutions illustrates the reluctance of the international community to be bound by legal instruments that would detail and develop the original principles established by the first generation of treaties. Therefore, letting the Outer Space regime at an embryonary level, where it lacks explicit mechanisms rendering it applicable.

Lastly, the third phase, from 1996 until today, is still characterized by the adoption of resolutions. Still, there are more interpretative of the existing treaties: Art. 1 para. 1 OST and the Resolution on Space Benefits Declaration⁴⁰, or the "launching state" definition from the Liability Convention and the Registration Convention and the Resolution on the Launching State⁴¹. The International community, therefore, holds to its will to regulate through General Assembly resolutions instead of new International Agreements, or amendments to the existing ones.

Such behaviour of avoiding binding rules, General Assembly resolutions being declaratory, only moves the International Community further away from reaching a Legal International Regime that could cover activities in Outer Space adequately. Such a trend lets the more powerful and technologically developed countries freely conduct activities in Outer Space. Therefore, It could lead to a situation of exclusiveness of Outer Space activities and resources to their benefit. Such a situation would maintain the *statu quo* between the developed and the developing world, in a way which is contrary to the United Nations' goals.

Such a trend is already happening, as we can see through the national legislation adopted by western countries in order to have Outer Space resources-related activities conducted from their soil.

2.2.2 The establishment of a Deep Seabed Regime

Through the UNCLOS was established the Deep Seabed regime covering the exploitation of deep seabed mining resources. This regime is intimately linked to the Outer Space regime, as it is based upon the CHM as it was firstly mentioned in the Moon Treaty.

³⁸ UNGA Res. 4165, Principles relating to Remote Sensing of the Earth from Outer Space, 3 December 1986.

³⁹ UNGA Res. 3792, Principles Governing the use by States of Artificial Satellites for International Direct Television Broadcasting, 10 December 1982.

⁴⁰ UNGA Res. 5122, Declaration on International Cooperation in the Exploration and Use of Outer Space for the Benefit in the Interests of all States, Taking into Particular Account the Needs of Developing Countries, 13 December 1996.

⁴¹ UNGA Res. 59115, Application of the Concept of the "launching state", 10 December 2004.

2.2.2.1 Preliminary developments

Initially, the Deep Seabed was considered to be part of the high seas⁴². Following such a status and the freedom of exploitation of resources in the high seas, it was considered that the Deep Seabed would be freely exploitable by any State having the technological means to do so. This meant that the industrialized would be the first to benefit from deep seabed mining exclusively, and also that developing countries relying on the commercialization of their mineral's exploitation may see their economies harmed by such activities, as they would lead to an increase of concurrence.

Therefore, during the 22nd General Assembly session on the 1st of November 1967, the Maltese ambassador before the UN, A. Pardo, pronounced a discourse during which he advocated for the Deep Seabed and its resources to receive the status of Common Heritage of Mankind⁴³. The issue he initially raised was the necessity to determine a Deep Seabed regime accompanied by a mechanism regulating the exploration and exploitation of its resources, especially polymetallic nodules.

His initiative got quickly backed by developing states that regarded the CHM principle as an integral part of the New International Economic Order they were aiming for⁴⁴. Indeed, such an order was to reduce inequalities between them and the developed countries.

This movement led to the adoption of UN GA resolutions concretizing the Maltese initiative.

Amongst these resolutions were two of particular importance. The first one was the 'Moratorium Resolution'⁴⁵. Adopted thankfully to a small majority, it requires that exploitation activities of the Deep Seabed shall be carried for the benefit of Mankind, especially taking into accounts the needs and interests of developed states. It also established that until an international legal regime covering such activities was developed, states had to refrain conducting them and no claim over the deep seabed resources would be recognized.

The second Resolution is the Declaration of Principles Governing the Sea-Bed and Ocean Floor⁴⁶. Through this Resolution, adopted with 108 votes in its favour, the General Assembly officially proclaims the Deep Seabed (the 'Area') and its resources as the Common Heritage of Mankind. In continuity with the previous Resolution, it proclaims that they may never be the

⁴² Yearbook of the International Law Commission (1956), vol. 1, 293.

⁴³ UN Doc A/C.1/PV 1515 adn A/C.1/PV 1516 (1967).

⁴⁴ *The Deep Seabed*. In: Rothwell D., Stephens T. (2016) *The International Law of the Sea*, 2nd Edition, Oxford and Portland, Oregon, Hart Publishing, p. 134.

⁴⁵ UNGA Res. 2574 (XXIV), Question of the Reservation Exclusively for Peaceful Purposes of the Sea-Bed and the Ocean Floor, and the Subsoil Thereof, Underlying the High Seas Beyond the Limits of Present National Jurisdiction, and the Use of Their Resources in the Interests of Mankind, 15 December 1969.

⁴⁶ UNGA Res. 2749 (XXV), Declaration of Principles Governing the Sea-Bed and the Ocean Floor, and the Subsoil Thereof, Beyond the Limits of National Jurisdiction, 12 December 1970.

subject of claims or exercise of sovereignty from states outside of the regime that was to be established. Furthermore, the exploitation activities conducted under this regime shall be carried out for the benefit of Mankind.

The developed states adhered to these resolutions as deep seabed mining was of no commercial value at the time. Still, they took the view that while the Area could not be subject to occupation, its resources could be mined⁴⁷, until an international regime would be established.

2.2.2.2 The United Nations Convention on the Law of the Sea

The United Nations Convention on the Law of the Sea was adopted in 1982, but did not enter into force before 1994, after the enactment of the 1994 Implementation Agreement.

Through its Part XI, it establishes a Deep Seabed regime covering mining activities and exploitation of resources in the Area. This Part XI is of historical importance as it strongly affected the effectivity of UNCLOS as a whole. Indeed, the regime it established relied heavily, and still relies, on the CHM principle. Consequently, its provisions were judged too strictly redistributive by the industrialized countries. This regime, therefore, refrained them from signing the UNCLOS, impacting the whole international waters regime.

Indeed, developing countries were defending a version of the International Seabed Authority that would extensively regulate and intervene in mining activities in the Area. On the other side, industrialized countries were advocating for an ISA that would only allow and register concessions for deep seabed mining⁴⁸. This led to an absence of consensus regarding the adoption of the UNCLOS. Therefore, it was adopted through a vote where most of the countries interested in deep seabed mining (industrialized) voted against or abstained themselves.

This was mainly due to the US declaring that, after a policy review from the Reagan administration, found themselves concerned with provisions of Part XI such as the technology transfer obligation, the ISA competence to emit regulation binding on member states, the lack of incentives for 'pioneer investors', production limitations and the revenue-sharing obligation⁴⁹.

After debating and concessions, including favour treatment for pioneer investors⁵⁰, the regime was still deemed as discouraging mining activities by the industrialized states. Parallely, they developed between themselves a system of reciprocal recognition of national licences granted for deep seabed mining, until the UNCLOS entered into force⁵¹.

⁴⁷ *The Deep Seabed*. In: Rothwell D., Stephens T. (2016) *The International Law of the Sea*, 2nd Edition, Oxford and Portland, Oregon, Hart Publishing, p. 134.

⁴⁸ Lowe A., *The International Seabed: A Legacy of Mistrust* (1981), 5 *Marine Policy* 205.

⁴⁹ Rothwell D., *The Deep Seabed*, p. 138.

⁵⁰ UNCLOS, Res. II.

⁵¹ Brown E., *Neither Necessary nor Prudent at this Stage* (1983), 17 *Marine Policy* 81, 82.

In the meantime, through Resolution I contained in the Final act accompanying the UNCLOS, was set up a Preparatory Commission whose mission was to prepare the establishment and operation of the ISA.

2.2.2.3 The 1994 Implementation Agreement

Guyana was the 60th state to ratify the UNCLOS, on the 16th of November 1993. Having been signed by developing States mainly, the entry into force of the convention proved to be a strong enough incentive for industrialized states and the developing states to reach a compromise. Indeed, wide ratification of the regime was needed for it to be effective, but also because the costs of the UNCLOS institution's functioning and maintenance were significant⁵².

Therefore, from 1990, the UN secretariats facilitated consultations with the industrialized countries to resolve specific issues refraining them to adhere to the UNCLOS, such as decision-making in the ISA, technology transfer, production policy⁵³...

Consequently, a group of representatives from each side reached a draft agreement on the implementation of UNCLOS' Part XI. It led to the adoption of the 1994 Agreement relating to the implementation of Part XI of the United Nations Convention on the Law of the Sea of 10 December 1982⁵⁴, which subsequently led to the adherence of the majority of the industrialized states to the UNCLOS. Still, the USA did not become a state party as the Senate refused the ratification of the convention.

The 1994 Implementation Agreement is of primary historical importance, as it marks the moment when a balance between the CHM principle (and its consequences) and commercial viability was found by the International Community. As states are beginning to unilaterally enact national legislation relating to Outer Space and exploitation of its resources, it is undoubtedly from this balance that inspiration should be drawn in order to establish a consensual regime that would effectively regulate such activities.

2.2.3 The resurgence of space legislation through national acts

Even though such national space legislation is claimed to be taken in accordance with the current International Outer Space Legislation, they mainly come from industrialized states (Kazakhstan, Indonesia and South Africa being the exceptions). This because these countries have the means to provide for launching facilities, and the financial means that would cover the costs consequential to damages caused by the launching operator. Therefore, it could lead

⁵² Rothwell D., *The Deep Seabed*, p. 140.

⁵³ Anderson D., *Efforts to Ensure Universal Participation in the UN Convention on the Law of the Sea* (1993), 42 *International Comparative Law Quarterly*, 654.

⁵⁴ UNGA Res. 48263, Agreement Relating to the Implementation of Part XI of the United Nations Convention on the Law of the Sea of 10 December 1982, 17 August 1994 (*1994 Implementation Agreement*).

to a monopoly of industrialized states over space activities, that would be detrimental to developing states if the CHM principle is not effectively enforced in national legislation.

France, through the Law on space operations⁵⁵, establishes a control and authorization regime. If an operator, regardless of its nationality, desires to use installations located on French territory, it has to be granted a license before. To this aim, it will have to undergo financial, legal, moral and technical examination from the relevant authority to be sure its project respects the safety of people, property, public health and the environment.

It requires the operator's operations to be insured but also provides State guarantee⁵⁶, as it will take care of responsibility costs exceeding the insurance cover.

The United States, with their Commercial Space Launch Act⁵⁷ (amended since then), provided with the first, and one of the most complete, legislation covering commercial uses of Outer Space.

It covers both space launch and re-entry of space vehicles in the US through a license-granting system. In order to obtain such a license, the operator must obtain policy and safety approvals after review by the Federal Aviation Administration. This authority will also determine the amount of insurance costs required to cover such activities, with a maximum of US\$500 million.

In 2015, the US completed it with a legal regime covering space resources, through the U.S. Commercial Space Launch Competitiveness Act of 2015⁵⁸. It establishes that non-living space resources were susceptible of appropriation⁵⁹.

In 2017, Luxembourg adopted an innovative approach to complete the usual authorization process as considered earlier. Indeed, through its Space Resources Act⁶⁰, it establishes that Outer Space resources are susceptible of appropriation⁶¹. Furthermore, it provides with a legislative framework covering mining activities in Outer Space. Indeed, it describes a detailed regime inspired by the financial sector⁶², which consists of an authorization procedure to conduct such activities, and a continuous supervision procedure over these activities.

⁵⁵ Loi relative aux opérations spatiales n°2008-51, adopted on 3 June 2008, entered into force on 10 December 2010.

⁵⁶ Ibid, Art. 6

⁵⁷ 51 US Code § 509, formerly the Commercial Space Launch Act of 1984, as amended by the Commercial Space Act of 1998.

⁵⁸ US Commercial Space Launch Competitiveness Act of 2015, entered into force on 25 November 2015.

⁵⁹ Ibid, §51303.

⁶⁰ Loi du 20 juillet 2017 sur l'exploration et l'utilisation des ressources de l'espace, entered into force on 20 July 2017.

⁶¹ Ibid, Art. 1.

⁶² Rapport de la commission de l'économie précédant la loi du 20 juillet 2017 sur l'exploration et l'utilisation des ressources de l'espace, Doc. parl. 7093/06, 2016-2017, p. 2.

Additionally, it indicates that such a regime is only accessible to private entities that locate their headquarters in Luxembourg⁶³. Regarding the fact that such legislation comes quite early, it is a strong way to ensure that the country will become a center of private Outer Space mining activities.

2.3 Conclusion

After a purely state-oriented development of Outer Space Law, there was a shift toward private and commercial use of Outer Space resources as technology improved. As the feasibility of such exploitation becomes closer and closer⁶⁴, it is needed to establish a regime regulating this activity that will be operational by the time private or public entities will begin to conduct it.

To this aim, as the massive signing of the Moon treaty looks unlikely, the UN must impulse the establishment of a new International Outer Space Regime based on the principles enacted by the first treaties. Following the aims of the UN, one of the main being reducing inequalities between countries, it is imperative that the CHM principle is taken into account through the development of such a regime.

Therefore, the Deep Seabed regime established by Part XI of the UNCLOS is, in my opinion, an adequate inspiration basis to be adapted to the needs and characteristics of such a specific zone as Outer Space is.

⁶³ Loi du 20 juillet 2017 sur l'exploration et l'utilisation des ressources de l'espace, Art. 7 (1).

⁶⁴ <https://www.bbc.com/news/science-environment-17827347>

3 The Deep Seabed: a model for the next stage of the Outer Space regime's development

3.1 Introduction

Before beginning to analyze the possible adaptation of the Deep Seabed regime to Outer Space, it is necessary to review the current legislation applicable to both areas in order to understand how the former could guide serve as an example for the development of the latter.

Indeed, the Deep Seabed present a complete legal regime, including and effective institutional framework, governing the exploitation of its resources. Therefore, and consequently to the similarities of the two zones established earlier, it seems adequate to review it, and the current state of Outer Space legislation, in order to see how the former could influence the latter.

3.2 The Deep Seabed

The Deep Seabed, also called the 'Area', is, according to the UNCLOS, a part of the High Seas. Therefore, it is subject to high seas freedom. Still, its resources are not open to exploitation as freely as the High Seas' resources are. Indeed, the UNCLOS establishes a specific regime regulating the exploitation of the resources of the Deep Seabed through its Part XI, modified by the 1994 Agreement Relating to the Implementation of Part XI which, as we saw earlier, adapted Part XI's regime in order to get the adhesion of the western states to the UNCLOS.

Nowadays, deep seabed mining is getting technologically feasible and economically viable. Therefore, States are beginning to enact domestic legislation⁶⁵, consistently with the UNCLOS, to enable such activities to take place. On its side, the ISA has drafted a mining code consisting of the full body of rules, regulations and procedures that aims to regulate prospecting, exploration and exploitation of marine minerals in the deep seabed. So far, The International Seabed Authority has issued 29 15-years exploration contracts for polymetallic sulfides, polymetallic nodules and cobalt-rich crusts.

In addition to the set of rules establishing UNCLOS Part XI's regime, and the regulations and contracts originating from the ISA, must be taken into account the judgments and advisories issued by the Seabed Dispute Chamber of the ITLOS, such as *Responsibilities and obligations*

⁶⁵ I.e.: International Seabed Mineral Acts 2015, Republic of Nauru, 23 October 2015.

*of States Sponsoring Persons and Entities with Respect to Activities in the Area (Seabed Mining Advisory opinion)*⁶⁶.

Let us consider in the following parts the actual Deep Seabed regime established by UNCLOS, and developed by the 1994 Implementation Agreement.

3.2.1 UNCLOS Part XI: Generalities

As seen before, the deep seabed regime comes from many sources, but the primary texts are the UNCLOS, through its Part XI, its Annex II containing the primary conditions for the process of prospecting, exploration and exploitation in the Area, and its Annex IV about the constitution of the Enterprise.

Still, because its interpretation of the CHM, and the mechanisms it established subsequently, were considered too strict and redistributive, it discouraged the developed countries to ratify it. This led to the writing of the 1994 Implementation Agreement that influenced the UNCLOS in order to make it more balanced between the development interests of the developing countries and the commercial interest of the developed countries.

Many actual provisions of the UNCLOS are the result of modifications by the 1994 Implementation Agreement.

The two instruments are to be interpreted as a single argument. In case of conflict of provisions, the 1994 Implementation Agreement's provisions prevail⁶⁷.

3.2.1.1 General provisions and principles

The Art. 133 to Art. 135 provide with general provisions relating to term definitions ('resources' and 'minerals'), the scope of the deep seabed and the interaction of Part XI's regime with the other areas (the water column and the airspace) above it.

In Part XI, Section 2, Art. 136 to the Art. 149 establish the principles governing the Area. Art. 136 affirms that 'The Area and its resources are the common heritage of mankind.' By being the first article in this section, it reminds that this principle is the basis on which the Area's legal regime is built.

Although it is not defined, its meaning is developed through the following articles which:

⁶⁶ ITLOS Case No. 17, *Responsibilities and obligations of States sponsoring persons and entities with respect to activities in the Area (Request for Advisory Opinion submitted to the Seabed Disputes Chamber)*, 1 February 2011 (*Seabed Mining Advisory Opinion*).

⁶⁷ 1994 Implementation Agreement, Art. 2(1).

- exclude the appropriation of such resources apart from under the rules established through Part XI⁶⁸,
- require activities carried in the Area to be carried for the benefit of the whole human-kind⁶⁹,
- impose the transfer of mining technology from the developed countries (assumed to be the first developing them and putting them to use in the Area) to developing countries and the Enterprise⁷⁰,
- ensure the effective participation of developing countries in the activities taking place into the Area⁷¹.

Following these principles shall be mentioned, as related to the CHM principle, provisions imposing a specific rate of production of minerals to the miners in order not to harm the economies of developing countries relying on the production of such minerals⁷².

As they will be considered later, the UNCLOS also establishes:

- A regulating authority: the International Seabed Authority⁷³, composed of diverse organs.
- The Enterprise: an organ of the authority destined to conduct commercial deep seabed mining activities parallelly the private mining companies⁷⁴
- The Seabed Disputes Chamber⁷⁵, part of the International Tribunal for the Law of the Sea.

3.2.1.2 The 1994 Implementation Agreement

Aiming to incentivize reluctant countries (industrialized states, aligning their position on the US') to sign the UNCLOS, the 1994 Implementation Agreement modified the UNCLOS in order to lighten the 'burden' that the CHM principle imposed to developed countries through their activities in the Deep Seabed.

Intimately linked to the UNCLOS, the 1994 Implementation Agreement provides that after its adoption by the UN GA, any state wishing to join the UNCLOS will automatically be considered having consented to be bound by the 1994 Implementation Agreement⁷⁶. *Vice versa*, no

⁶⁸ UNCLOS, Art. 137.

⁶⁹ Ibid, Art. 140.

⁷⁰ Ibid, Art. 144.

⁷¹ Ibid, Art. 148.

⁷² Ibid, Art. 151.

⁷³ Ibid, s. 4, subs. A to D.

⁷⁴ Ibid, subs. E.

⁷⁵ Ibid, s. 5.

⁷⁶ 1994 Implementation Agreement, Art. 4(1)

state could adhere to the 1994 Implementation Agreement without consenting to be bound by the UNCLOS' provisions⁷⁷.

The 1994 Implementation Agreement did not substantially modify the general principles of the 1982 UNCLOS version. It established the current articles concerning: the geographical scope of the Area⁷⁸, the current principle excluding the exercise of sovereignty over it⁷⁹, the prohibition of alienation of its resources unless they are recovered under its regime⁸⁰.

One of the main contributions of the 1994 Implementation Agreement was to discard the provisions, derived from the CHM principle, limiting the mineral productions in order not to harm the economies of the developing countries relying on the production of such minerals. Understandably, it provoked relief through the industrialized states reluctant to sign the UNCLOS considering the size of the financial investment required to conduct deep seabed mining.

Following a more market-orientated approach, the 1994 Implementation Agreement provides that development of the resources of the Area is to take place in accordance with sound commercial principles⁸¹. Consequently, it modified the operation process of the ISA in order to make it more responsive, cost-effective and commercially orientated⁸². Parallely to the ISA, it also impacted the Enterprise by placing it on the same level as the private contractors conducting deep seabed mining activities, even though it is supposed to be an essential actor of the CHM principle by having to redistribute the profits it would make through its own activities in the Deep Seabed.

Last but not least, the technology transfer obligation provisions went from compulsory technology transfer from a contractor to a developing country/ the Enterprise⁸³ to the contractor facilitating the latter's acquisition of such technology⁸⁴, in cases where they are unable to obtain it by themselves or through the market.

3.2.2 UNCLOS: the institutions

3.2.2.1 The International Seabed Authority

⁷⁷ Ibid, Art. 4(2).

⁷⁸ UNCLOS, Art. 1(1).

⁷⁹ Ibid, Art. 137.

⁸⁰ Ibid.

⁸¹ 1994 Implementation Agreement, Annex, s. 6(1)(a).

⁸² Ibid, s. 1(2).

⁸³ UNCLOS, annex III, Art. 5.

⁸⁴ 1994 Implementation Agreement, Annex, s. 5.

The creation of the ISA was made necessary by the designation of the Area as the Common Heritage of Mankind, as there was a need for a central institution that could protect investors developing deep seabed resources by granting them exclusive access to nominated zones⁸⁵.

It is stated in Art. 157 of the UNCLOS that the ISA is:

'The Authority is the organization through which States Parties shall, in accordance with this Part, organize and control activities in the Area, particularly with a view to administering the resources of the Area.'

Still, the ISA only has competence over the seabed mineral resources, meaning solid, liquid or gaseous mineral resources in or beneath the seabed⁸⁶.

The membership of the ISA come *ipso facto* with the status of state party to the UNCLOS. It is composed of three principal organs: the Assembly, the Council and the Secretariat; and two subsidiary bodies: the Legal and Technical Commission (which assists the Assembly and the Council, and deals with scientific and technical issues) and the Finance Committee.

Decisions taken within the organs of the ISA are to be reached through consensus, or by vote, if no consensus is reached⁸⁷. So far, all decisions on matters of substance have reached consensus⁸⁸. This shows the functional viability of the organs of such a regime.

The Assembly is composed of all the states parties to the UNCLOS. It is the highest decision-making organ of the ISA⁸⁹. It has competence, under the UNCLOS provisions, to issue general policies over activities relating to the resources of the deep seabed. This translates into the adoption of regulations, rules and procedures covering such activities⁹⁰. Such powers include the competence to review and approve all regulation related to the equitable sharing of financial and economic benefits derived from activities in the Area, with particular attention being given to the interest and needs of developing states⁹¹.

This shows that the ISA is not only a regulating actor of the Area, but is also a direct protector of the effectiveness of the CHM principle, by having due regard over the redistribution of resources that arise from it.

⁸⁵ Rothwell D., *The Deep Seabed*, pp. 127 – 154.

⁸⁶ UNCLOS, Art. 133.

⁸⁷ 1994 Implementation Agreement, Annex, s. 3.

⁸⁸ Satya Nandan, *Administering the Mineral Resources of the Deep Seabed*. In: Freestone D., Barnes R. and M Ong D. (2006) *The Law of the Sea: Progress and Prospects*, Oxford, Oxford University Press.

⁸⁹ UNCLOS, Art. 160.

⁹⁰ *Ibid.*

⁹¹ *Ibid.*

The Council is the executive organ of the ISA. It has responsibility for supervising and coordinating the implementation of the deep seabed mining regime⁹². Its competence includes the approval of plans of work for exploration and exploitation of resources in a specific site after a reviewed by the Legal and Technical Commission. Its 36 members are elected and must represent different groups of state parties⁹³:

- 4 must be from states having been major consumers or importers of minerals for the last 5 years.
- 4 must be from states that have been the largest investors in deep seabed mining, directly or through their nationals.
- 4 must be from parties being major net exporters of minerals.
- 6 must be from developing states that represent special interests (large population, landlocked, geographically disadvantaged).
- 18 are elected as to represent an equitable geographical distribution of seats.

Even though it looks balanced, the cumulation of seats coupled with the decision-making system could lead to industrialized states, especially the bigger ones (US, China), having the possibility to block or veto through the organs decision-making process.

Although seeming balanced, the seats-cumulation possibility in the Council shows that industrialized states may still have more influence in the activities of the ISA. A more numerous opposing-group could counter such influence in the Assembly, but such a scenario is only relevant in case of a vote.

3.2.2.2 The Seabed Dispute chamber

The Seabed Disputes Chamber is established by Part XI of the UNCLOS. It has compulsory jurisdiction over disputes between states parties regarding activities taking place in the Area⁹⁴. It also has competence for issuing Advisory opinion on legal questions arising within the scope of activities within the Area⁹⁵.

So far, the Seabed Disputes Chamber has only rendered one decision: the *Seabed Mining Advisory Opinion*⁹⁶. This advisory opinion was issued on request of the states au Nauru and Tonga, who were seeking for clarification about the liability regime applicable to their sponsoring of deep seabed mining.

Through its answer, the ISA examined three relevant issues arising from the question asked.

⁹² UNCLOS, Art. 162.

⁹³ 1994 Implementation Agreement, Annex, s. 3(15).

⁹⁴ UNCLOS, Art. 187.

⁹⁵ Ibid, Art. 190.

⁹⁶ *Seabed Mining Advisory Opinion*.

It first concluded that states' responsibility to ensure' that activities conducted by the sponsored contractors were conducted in conformity with the UNCLOS was an obligation of means, and not of results⁹⁷. This being motivated by the will to fight the apparition of states' of convenience', that would contravene the uniform application of principles applicable to the Area, especially the CHM principle⁹⁸.

Then, the liability of a sponsoring state only derives from its own failure to fulfil its due diligence obligation to take 'all necessary and appropriate measures to secure effective compliance'⁹⁹. Thus, establishing that there is no strict liability weighing over the sponsoring state. This poses the problem of damage occurring even though the sponsoring state, and maybe the contractor, discharged their due diligence obligation as then no redress could be claimed¹⁰⁰. The chamber then suggested the establishment of a trust fund to compensate for damage not covered by the liability regime¹⁰¹.

Finally, it explained that such a due diligence obligation consists of adopting and enacting laws and regulations to ensure that the contractor respects the UNCLOS obligations. Contractual obligations between the contractor and the sponsoring state not being considered sufficient substitutes to such regulations¹⁰².

3.2.3 Current ISA activities

The ISA works on a Mining Code that gathers various relevant UNCLOS and 1994 Implementation Agreement provisions, and ISA regulations in order to render the legal framework covering deep seabed mining easily accessible to the contractors.

It also aims to lower transactional costs of deep seabed mining by providing a two-page standard form contract, consequently reducing the amount of negotiation with every contractor by establishing a set of standard clauses to be systematically used¹⁰³.

As an example, it includes the Nodule Regulations deal¹⁰⁴, which covers notifications of prospecting from contractors, and reviews their plans of work. Firmly focused on the prevention of environmental harm resulting from deep seabed mining activities, it entails states to follow

⁹⁷ *Seabed Mining Advisory Opinion* [110].

⁹⁸ *Ibid* [159].

⁹⁹ UNCLOS, Art. 139(2).

¹⁰⁰ Rothwell D., *The Deep Seabed*, p.147.

¹⁰¹ *Seabed Mining Advisory Opinion* [205].

¹⁰² *Ibid* [226].

¹⁰³ Developing a Regulatory Framework for Mineral Exploitation in the Area (2016), Annex I: Working draft of Exploitation Regulations and Standard Contract Terms, International Seabed Authority.

¹⁰⁴ Regulations on Prospecting and Exploration for Polymetallic Nodules in the Area adopted 13 July 2000, International Seabed Authority (Nodules Regulations).

a precautionary approach, as reflected in Principle 15 of the Rio Declaration¹⁰⁵. Under it, the ISA is to keep under periodic review its rules, regulations and procedures¹⁰⁶; and it empowers the Secretary-General to issue emergency orders binding on contractors when made aware of serious actual or potential environmental harm¹⁰⁷.

3.2.4 Deep Seabed Mining Regime's functioning

The Deep Seabed Mining regime divides the mining process into three stages: prospecting ('the search for deposits of polymetallic nodules in the Area...without any exclusive rights'¹⁰⁸), exploration ('searching for polymetallic nodules in the Area with exclusive rights'¹⁰⁹) and exploitation ('the recovery for commercial purposes of polymetallic nodules in the Area and the extractions of mineral therefrom'¹¹⁰).

Prospecting may be freely conducted. First, the applicant must notify the ISA of its intention of prospecting, supported by a written promise that it will comply with the UNCLOS' requirements. Even though prospecting does not confer rights over resources to the applicant, he may recover reasonable amounts of minerals for testing purposes¹¹¹.

Then, for exploration, the applicant may apply for approval of plans of work, by the ISA¹¹². If made by a non-state entity, such an application must be supported by a certificate of sponsorship from the which state the entity is a national, or from which the persons controlling it are from¹¹³. Through these plans, the applicant must demonstrate that he is financially and technically capable of carrying them, including its financial contribution to the ISA¹¹⁴.

There intervenes, the 'parallel system' involving the Enterprise. Indeed, the plans of work must cover an area large enough for the Council to designate a part which will be reserved to the Enterprise or developing states (directly or through sponsorship) for future exploitation¹¹⁵. Therefore, it ensures that least developed states will benefit from such activities: if not undertaking them themselves, they will at least receive benefits from the profits made by the Enterprise through redistribution. Once again, even watered down by the 1994 Implementation, the

¹⁰⁵ Nodules Regulations, reg. 31(2)

¹⁰⁶ Ibid, reg. 31(1).

¹⁰⁷ Ibid, reg. 32.

¹⁰⁸ Nodules Regulations, reg. 1(3)(e).

¹⁰⁹ Ibid, reg. 1(3)(b).

¹¹⁰ Ibid, reg. 1(3)(a).

¹¹¹ UNCLOS, Annex III, Art. 2(2).

¹¹² Nodules Regulations, reg. 9.

¹¹³ Ibid, reg. 11.

¹¹⁴ Ibid, reg. 12.

¹¹⁵ Ibid, reg. 16(2).

CHM principle shows its presence and effectiveness (at least on paper, as the Enterprise did not undertake any activities in the Area yet).

Still, not to harm the development of deep seabed mining activities, the applicant may apply for a plan of work concerning the reserved area if no competent entity (Enterprise or developing state) did so within 15 years after the initial plans of work approval, if it guarantees the inclusion of the Enterprise to these activities through a joint-venture partnership¹¹⁶. The application fee for exploration is 500,000US\$. When the exploration materially begins, follows an obligation to pay additional annual fees.

After the plans of work's approval by the Council, it is converted to a contract between the ISA and the applicant. The contract provides the now contractor exclusive rights to explore and exploit the resources present within the area (not exceeding 150,000 km²) covered by the plan of work¹¹⁷.

During the period of the contract, the ISA has a duty of monitoring the contractor's performance according to the contract's term. The Council has the power to suspend or terminate the contract if, after written warnings, the contractor violated provisions of the contract, UNCLOS, the 1994 Implementation Agreement, or of rules and regulations adopted by the ISA.

¹¹⁶ Ibid, reg. 17(3).

¹¹⁷ Nodules Regulations, reg. 24(1).

3.3 Outer Space

From 1967 until today, Space law has been developed internationally through the adoption of treaties and non-binding provisions, such as UN General Assembly Resolutions or works from International law committees.

In order to understand the progressive development and consolidation of Space Law, its building has to be divided following three chronological phases described earlier.

Additionally, it is essential to realize that the International Space Law framework is more structured by the principles it establishes than the instruments that establish them. Indeed, as these instruments lack clarity and coherence, and as they are divided between ‘soft’ and ‘hard’ law, these principles seem to be the core rules structuring the actual International Outer Space regime.

3.3.1 The 1st cycle of Space law-making (1959-1979) – Outer Space Treaty and Moon Agreement

This first cycle, started by the UN General Assembly Resolution 1472 (XIV) adopted on the 12th of December 1959¹¹⁸, establishing the United Nations Committee on the Peaceful Uses of Outer Space (UNCOPUOS), this cycle led to the five following agreements:

- The 1967 Outer Space Treaty

With 107 ratifications as of the 1st of January 2019, the OST is the most important international agreement on human activities in Outer Space. Its principles, as described in the following, strongly influence the rest of Space Law and Space Law-making. These principles being: Freedom of exploration and use¹¹⁹, the Non-appropriation principle¹²⁰, Principle of application of International Law to human activities in Outer Space¹²¹, Principle of the use of Outer for peaceful purposes¹²², Principle of responsibility of States for their activities in Outer Space¹²³, by themselves as public entities or by private entities under their jurisdiction, the Principle of International Liability of states in case of damages caused by space objects¹²⁴, and the Principle of registration¹²⁵.

¹¹⁸ UNGA Res.1172 (XIV), International Cooperation in the Peaceful Uses of Outer Space, 12 December 1959.

¹¹⁹ Outer Space Treaty, Art. I.

¹²⁰ Ibid, Art. II.

¹²¹ Ibid, Art. III.

¹²² Ibid, Art. IV.

¹²³ Ibid, Art. VI.

¹²⁴ Ibid, Art. VII.

¹²⁵ Ibid, Art. VIII.

Through these articles and the principles they carry, the OST lays the foundations of International Space Law and defines the orientations it is supposed to follow.

- The 1968 Rescue Agreement.¹²⁶

- The 1972 Liability Convention.¹²⁷

- The 1975 Registration Convention.

With 68 ratifications as of the 1st of January 2019 (only around 2/3 as many ratifications as its predecessors), the Registration Convention¹²⁸ develops the principle of registration of objects launched into Outer Space by the launching state, as introduced through Art. VIII OST. The Registration Convention requires states involved in space activities to establish and maintain a registry of such activities, and to report specific related information to an international registry under the supervision of the Secretary-General of the United Nations.

- The 1979 Moon Agreement.

With only 18 ratifications as of the 1st of January 2019, it is evident that the Moon Agreement weights less than the OST regarding its legal effectiveness and its influence in International Space Law. Still, it is relevant as it refers to the Moon and also Other celestial bodies, including asteroids, who are being today the objects of growing commercial interest from entrepreneurs because of their natural resources.

The Moon Agreement repeats essential principles of the OST but enlarges its scope. It shall not be examined in isolation, ignoring its roots in the OST¹²⁹. It is, therefore, to be taken into consideration as it reiterates OST principles (such as the non-appropriation principle¹³⁰) and develops a new principle, the Common Heritage of Mankind principle¹³¹. According to this principle, the exploitation of natural resources on the Moon and, implicitly, the other celestial bodies shall not benefit solely to the exploiting company or country, but shall benefit to the whole community of states and, according to certain interpretations, to future generations.

¹²⁶ Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Objects Launched into Outer Space, 672 UNTS 119, adopted on the 22nd of April 1968, entered into force on the 10th of October 1967.

¹²⁷ Convention on International Liability for Damage Caused by Space Objects, 961 UNTS 187, adopted on the 29th of March 1972, entered into force on the 1st of September 1972.

¹²⁸ Convention on Registration of Objects Launched into Outer Space, 1023 UNTS 15, adopted on the 14th of January 1975, entered into force on the 15th of September 1972.

¹²⁹ Lyall F. & Larsen P.B., Space Law (2007), London, Routledge, p. 178.

¹³⁰ Moon Agreement, Art. 11.

¹³¹ Ibid.

Still, the Moon agreement does not provide any details about this principle and the redistribution it implies. Such an obligation of redistribution diminishes the commercial viability and interest of the recovery and exploitation of these natural resources. It is an obvious reason for such a lack of states willing to ratify the Agreement.

3.3.2 The Second cycle of Space law-making (1982-1996)

This second cycle began with the UN General Assembly Resolution on Direct Broadcasting by Satellites¹³² in 1982. This cycle is characterized by the change from the adoption of binding international agreements to the adoption of non-binding UN General Assembly Resolutions. Their material is not of particular importance regarding the topic of this thesis, but they show the International Space Law's tendency to "soften" over time. This was not a potential problem at the time, as space activities were considered less attractive, and too costly, than during the first cycle. However, as such activities are getting more and more accessible, will be seen further in this thesis why such 'soft law' will not be enough to ensure the establishment of an effective international regime.

These resolutions are the:

- UN General Assembly Resolution on Direct Broadcasting by Satellites.
This Resolution provides an answer to the problem of the authorized amount of broadcasting overspill into foreign territory under International Law.
- UN General Assembly Resolution on Remote Sensing.
This Resolution provides with the "Principles Relevant to Remote Sensing of the Earth from Outer Space"¹³³.
- UN General Assembly Resolution on Nuclear Power Satellites.
This Resolution¹³⁴ provides with principles covering the use of nuclear power sources on board of satellites, and requires specific preventive measures would their use be potentially dangerous.

3.3.3 The third cycle of space law-making (1996-Today)

¹³² UNGA Res. 3792, Principles Governing the Use by States of Artificial Earth Satellites for International Direct Television Broadcasting, 10 December 1982.

¹³³ UNGA Res. 4165, Principles relating to Remote Sensing of the Earth from Outer Space, 3 December 1986.

¹³⁴ UNGA Res. 4768, Principles Relevant to the Use of Nuclear Power Sources in Outer Space, 14 December 1992.

This third phase is characterized by a switch from the creation of norms of International Space Law to the further interpretation of the already-existing principles. This happened mostly through soft law acts such as:

- The 1996 Space Benefits Declaration.
This UN General Assembly resolution¹³⁵ develops the provisions of Art. I, para. 1 OST:
‘The exploration and use of outer space, including the moon and other celestial bodies, shall be carried out for the benefit and in the interests of all countries...’
It provides that "States are free to determine" how and with whom they want to cooperate in the exploration and use of Outer Space. It thus rejects the claim of developing countries for an automatic institutionalized cooperation¹³⁶ similar to the one attached to the exploitation of natural resources in the International Deep Seabed, such as established by Part XI of the Law of the Sea Convention.
- The 2004 UN General Assembly Resolution on the launching State¹³⁷
- The 2007 UN General Assembly Resolution on Registration Practice¹³⁸
- The 2013 UN General Assembly Resolution on National Space Legislation.
This Resolution¹³⁹ is derived from the general principle provided by Art. VI OST, stating that private activities in Outer Space are allowed if authorized and continuously monitored by the responsible State. It furthers it, and the national legislation building process, as its provisions relate to the competent national authority regarding authorization and supervision, a possible recourse mechanism, transfer of ownership in Outer Space, insurance requirements, etc.
- The 2007 UNCOPUOS Space Debris Mitigation Guidelines¹⁴⁰

¹³⁵ UNGA Res. 5122, Declaration on International Cooperation in the Exploration and Use of Outer Space for the Benefit in the Interest of All States, Taking into Particular Account the Needs of Developing Countries, 13 December 1996.

¹³⁶ Hobe, S. (2019) *Space Law*, Baden-Baden, Nomos Verlagsgesellschaft, p. 64.

¹³⁷ UNGA Res. 59115, Application of the Concept of the “launching State”, 10 December 2004.

¹³⁸ UNGA Res. 62101, Recommendations on Enhancing the Practice of States and International Intergovernmental Organizations in Registering Space Objects

¹³⁹ UNGA Res. 6874, Recommendations on National Legislation Relevant to the Peaceful Exploration and Use of Outer Space, 11 December 2013.

¹⁴⁰ UNGA Res. 62217, Space Debris Mitigation Guidelines of the United Nations Committee on the Peaceful Uses of Outer Space, 22 December 2007.

3.4 Principles of relevance

Throughout these legal instruments are revealed International Space Law principles governing this area. As seen earlier, the CHM principle is not solidly established over Outer Space. Nevertheless, these principles play a role of influence over as they are relating to each other.

3.4.1 The non-appropriation principle

Mentioned in the OST and in the Moon Agreement¹⁴¹, the non-appropriation principle establishes that Outer Space and celestial bodies are not subject to national appropriation by claims of sovereignty, by means of use, of occupation or by any other means¹⁴². By proclaiming this, the non-appropriation principle makes Outer Space an international common and can be considered to be of *jus cogens* status¹⁴³: it is therefore of fundamental importance. Indeed, that is following this status that the CHM principle comes into play, as a principle indicating the international regime to be developed based on such a status.

Still, such a principle remains blurry, especially regarding Outer Space resources. Indeed, even though national appropriation of Outer Space is prohibited, the question of its resources is not adequately considered, and it therefore lets open the possibility of their appropriation without appropriating of the territory where they would be found. Allowing this would mean allowing a first come first served space mining race, a scenario that ought to be prevented, with the help of the CHM principle.

Still, such a complementary approach, pairing the non-appropriation principle with the CHM to exclude the appropriation of Outer Space and regulate the appropriation of its resources, may be considered contradictory to another fundamental Outer Space principle: the Freedom of Exploration and Use.

3.4.2 The Freedom of Exploration and Use

Art. I OST states in its para. 2:

'Outer space, including the moon and other celestial bodies, shall be free for exploration and use by all States without discrimination of any kind, on a basis of equality and in accordance with international law, and there shall be free access to all areas of celestial bodies'

¹⁴¹ Outer Space Treaty, Art. II ; Moon Agreement. Art. 11 para. 1

¹⁴² Outer Space treaty, Art.II.

¹⁴³ Hobe, S. (2019) Space Law, Baden-Baden, Nomos Verlagsgesellschaft, p. 70.

Once again, while there is explicit freedom of states to explore and use Outer Space, the implications of such terms remain unclear. Indeed, the term use could be considered as a use of Outer Space as a zone, for example for satellite communication, or if it includes the commercial use of its resources, such as mining resources, which are not infinite, and that one's enjoyment precludes the enjoyment of another.

However, the freedom of space principle establishes in its para. 1 that exploration and use of Outer Space shall be carried out for the benefit and in the interests of all countries¹⁴⁴. Therefore, it is coherent with the principle previously considered, as such exploitation is to be conducted under conditions.

However, these conditions lack precision and clarity, especially about how such activities shall be conducted so they benefit to all countries, or about mechanisms that could ensure it.

3.5 Conclusion

From this, we can conclude that the Deep Seabed regime is indeed a solid basis to which could be compared the international regime that would cover the exploitation of resources in Outer Space, whether it arises from the regime described in the moon treaty or from a whole new set of rules.

Indeed, the institutions established by the UNCLOS showed that they are effectively designed to ensure that they safeguard the consequences borne by the CHM principle while assuring the execution of a commercially viable deep seabed mining regime.

Therefore, regarding the need of getting as many states as possible to adhere to an international legal instrument in order to establish an effective international regime, it can be safely concluded that the Deep Seabed regime is a good example to follow, regarding the balance it found between the interests of the CHM principle and those of industrialized states.

Consequently, should be determined if such a regime could be adapted to the outer Space, respecting its established principles and especially taking into account the CHM principle, order to avoid the exploitation of resources in outer Space being exclusively reserved to developed states. Indeed, regarding how expensive and technologically demanding such activities are expected to be, it is highly unlikely that developing states will be able to consider conducting them, even benefitting from a transfer of technology mechanism, before a long time.

¹⁴⁴ Outer Space Treaty, Art. I.

4 A CHM-based regime transposition

As for now, the Outer Space international legislation does not provide with any mechanisms or institutions regulating the exploitation of its resources or the ones of celestial bodies. It is composed of a wide variety of treaties establishing different principles that lack details as of their implications and consequences, and their provisions and the terms they employ lack clarity and leave them open to too broad interpretation.

As an international regime covering the exploitation of Outer Space resources is growingly needed, the Deep Seabed regime presents an adequate model, as both zones are strongly linked to the CHM principle, through legal instruments and their common status.

4.1 Introduction

The need for an international regime covering the exploitation of Outer Space resources is motivated by a desire not to see them exclusively benefit to industrialized states. To avoid such an occurrence, the principles regulating Outer Space should be clear in order to be the basis for the adequate regime to be established.

The first issue to be considered in the actual Outer Space legislation is its lack of clarity and details, whether it concerns the rules or the terms it contains.

Firstly, the non-appropriation principle, as it is established in the OST¹⁴⁵, only prohibits the appropriation of Outer Space, the Moon and celestial bodies. It does not mention the resources they contain. Therefore, this led to divergent interpretations of the principle: some assume that the absence of such a mention is purposeful¹⁴⁶ and allows to freely exploit these resources when associated with the right to freely explore and use Outer Space¹⁴⁷; while others argue that the reference to Outer Space, the Moon and other Celestial Bodies also implies the natural resources they contain, as no distinction between Outer Space and its resources are made through the entirety of OST¹⁴⁸.

Another issue would be are loopholes in the space legislation, as the main international space law instruments were enacted at a time when only states were involved in space activities. As

¹⁴⁵ Outer Space Treaty, Art. II.

¹⁴⁶ Williams M., *The Exploration and Use of Natural Resource in the Law of the Sea and the Law of Outer Space*, Proceedings of the Twenty-Ninth Colloquium on the Law of Outer Space (1987), 198.

¹⁴⁷ Outer Space Treaty, Art. I.

¹⁴⁸ Gorove S., *Limitations on the Principle of Freedom of Exploration and Use in Outer Space: Benefits and Interests*, Proceedings of the Thirteenth Colloquium on the Law of Outer Space (1971), 74.

an example, Art. II OST bans states from appropriating Outer Spaces and its celestial bodies. Still, it does not explicitly prohibit private subjects from doing so¹⁴⁹. Of course, such a claim does not resist a reasoned answer, especially when states are, themselves, prohibited to conduct such activities that private entities would need them to allow under their jurisdiction¹⁵⁰.

Nevertheless, this indicates that there is a need for a new or extended legal regime covering the exploitation of resources in Outer Space. As such terms or loopholes are usually the objects of collective agreement amongst scholars and state representatives, they need to be legally addressed for International Space Law to ensure the role of basis for a proper Space-mining regime.

Parallely to this need for clear principles is the need for an international regime in order to ensure that states do not act unilaterally regarding space mining activities, and to provide for mechanisms to ensure that such activities can be safely conducted, from a legal point of view.

As we saw earlier, states are enacting their own space legislation regarding the exploitation of space resources. The actual space law principles being broad and quite underdeveloped, this left a wide range of manoeuvre for states to interpret them accordingly to their aim. Thus, they do so while claiming that their domestic laws, enabling the exploitation of Outer Space resources, respect the established international legislation.

This is problematic, as it lets states unilaterally grant licenses of exploitation of resources located in an international area. In other words, they express their sovereignty beyond their borders, thus indirectly impacting the situation of other states.

As an example, Luxembourg established that space resources are capable of being appropriated¹⁵¹, without indicating on which jurisdictional basis the property rights arising from such an appropriation rely. Initially, Luxembourg précised that such an expropriation was possible in accordance with international law, but withdrew this statement after its *Conseil d'Etat* stressed that there could possibly be a contradiction between international law and such an affirmation¹⁵².

This illustrates the conscious moves states are undertaking by adopting legislation they know may be contradictory to International Legislation. As this could be considered as state practice influencing the development of international Space Law in a certain way, not regulating such

¹⁴⁹ Tronchetti F., Legal aspects of space resources utilization, p. 779.

¹⁵⁰ *Privateering and profiteering on the Moon and Ohter Celestial Bodies: debunking the Myth of Property Rights in Space*, Stern P.M. & Tenner L.I. In: Proceedings of the Forty-Fifth colloquium on the Law of Outer Space (2003), 59.

¹⁵¹ Loi du 20 juillet 2017 sur l'exploration et l'utilisation des ressources de l'espace, Art. 1, entered into force on 20 July 2017.

¹⁵² Conseil d'Etat, Projet de loi sur l'exploration et l'utilisation des ressources de l'espace, Avis v. 7.4.2017, N°CE 51.987, Luxembourg.

practices could lead to a *fait accompli* situation that would be contradictory to the aims of the international community, especially the CHM principle.

Private entities interested in space mining activities may, therefore, be refrained to invest in them as they would not be certain of the potential economic gains¹⁵³. Indeed, such unilateral national legislation is disputed, may be thwarted by the development of an international regime or by concurrent legislation from other states. Therefore, it harms the whole international community as it slows down the growth of the space mining economy by private operators, and consequently, the gains that will undoubtedly arise from it.

Such a unilateral process happened in relation to the Deep Seabed, as the industrialized states began to set up an alternative regime for exploitation on the Deep Seabed resources, in order to protect the interest of their companies already engaged in the development of Deep Seabed Technologies. This 'Reciprocating States Regime'¹⁵⁴ consisted of each of these states adopting similar domestic legislation to emit licenses to private entities (at a lower cost than under the ISA), and a commitment to coordinate legislations and activities allowed.

Such an alternative regime was unbearable for UNCLOS effectiveness. This led to the development and adoption of the 1994 Implementation Agreement.

The 1994 Implementation Agreement led to the final and consensual form of the Deep Seabed regime, through the introduction of a new and more market-oriented interpretation of the CHM Principle.

This new Deep Seabed regime presents an interesting potential to serve as an inspiration for the development of an Outer Space regime, and proves that an international system managing resources beyond national borders is possible.

First, it displays a complete and effective procedural regime regarding the grant of licenses for prospection, exploration and exploitation by entities willing to engage in deep seabed mining. Additionally, it establishes a sponsoring-state mechanism comparable to the actual launching-state responsibility mechanism already established in Outer Space.

However, the essential point to consider when evaluating the adequacy of the Deep Seabed regime to Outer Space is the optimized balance of interests it reached thanks to the 1994 Implementation Agreement.

Indeed, it confirmed that an adequate interpretation of the CHM involves accompanying its redistributive implication with economic ease and measures aimed at inciting industrialized states to get involved with the resources it is covering. The best success-indicator of this being

¹⁵³ Twibbel S., *Space Law: Legal Restraints on Commercialisation and Development of Outer Space*, 65 University of Missouri Kansas City Law Review (1997), 589.

¹⁵⁴ Tronchetti F., p. 794.

the number of signatures UNCLOS received from industrialized states after the 1994 Implementation Agreement.

Additionally, even if it is more market-oriented than before, the Deep Seabed regime still shows efficiency in helping developing states getting involved in Deep Seabed mining. Indeed, as the Republic of Nauru illustrates it, developing states are highly attractive to deep seabed mining companies as they allow them, through sponsorship, to access mining areas reserved to these developing states' activities¹⁵⁵. It has nevertheless to be noted that the economic benefits for the Republic of Nauru's government are uncertain¹⁵⁶. Considering this, it is now the role of such developing states to implement legislation that will ensure them benefits from sponsored deep seabed mining activities while staying attractive to the entities conducting such activities.

This confirms that, beyond the similarities of their situations, the Deep Seabed regime is an excellent example for Outer Space thankfully to the optimized balancing of interests it establishes, such as we saw earlier.

To provide for the Outer Space Regime needed, some public and private entities have advocated for modification, by way of amendments, of the OST¹⁵⁷, others have suggested leaving such a pillar of Space Law untouched, and seek for clarity through multilateral agreements and consensual definitions¹⁵⁸. However, this illustrates the need for the establishment of a detailed regime covering the exploitation of Space resources, as a prolongation of the already existing international legal instruments.

4.2 The Common Heritage of Mankind principle

4.2.1 Concept and evolution

First appearing in the Moon Agreement, and then being considered for the Deep Seabed, the CHM principle is a highly debated notion of international law, and no agreement regarding its definition and consequences has been reached¹⁶¹.

¹⁵⁵ Feichtner I., Mining for humanity in the deep sea and outer space: The role of small states and international law in the extraterritorial expansion of extraction, *Leiden Journal of International Law* (2019), 32, pp. 255-274.

¹⁵⁶ World Bank, *Pacific Possible: Long-term Economic opportunities and Challenges for Pacific Island Countries* (2017).

¹⁵⁷ Foust J., Cruz Interested in Updating Outer Space Treaty to Support Commercial Space Activities, *SpaceNews*, 26 April 2017.

¹⁵⁸ Gold M., Testimony of Mike Gold Before the Subcommittee of Space, Science and Competitiveness of the Committee on Science, Space and Technology, United States Senate, 23 May 2018.

¹⁶¹ Tronchetti F., *Legal Aspects of Space resources utilization*, p. 783.

It is considered to be an evolution of the *res communis* status of an international area¹⁶², following which all states are to be allowed equal access to natural resources.

The CHM strictly extends this concept as it seeks to establish a framework that legally ensures states equality of access and enjoyment of resources, if not by fact, then by means. Therefore, it considers that such areas shall be commonly managed by all states, as they are thought to represent the whole humankind.

Following this, activities in areas covered by the CHM principle shall be managed internationally to ensure orderly management of the area resources, and equitable redistribution of the benefits derived from their exploitation.

The CHM principle is closely linked to the political state of the international community at the time it began to be evoked. Indeed, it derives from the view of a new international economic order consequent to the emergence of newly independent developing states. From this conception, industrialized states had to balance the gap between them and developing states, in order to compensate for the benefit they got from previously exploiting those states resources and economies.

Under this new International economic order, industrialized states had to mandatorily transfer technology to developing countries, financially assist them and create a licensing system for international goods which gave preferential access to less technologically advanced states¹⁶³.

This has directly influenced the conception of the initial Part XI of the UNCLOS, which establishes the CHM principle as the foundation of the regime covering Deep Seabed's resource exploitation. This led to the establishment of the ISA, and the redistribution mechanisms envisaged in the pre-1994 implementation agreement version of the UNCLOS.

The latter agreement modifying the regime in order to make it less strict, redistributive, and more market-oriented led to an almost unanimous adoption of the Convention by the international community.

In Outer Space, the CHM principle was firstly introduced by the Declaration of Legal Principles Governing the Activities of States in the Exploration and Use of Outer Space¹⁶⁵; that declared that the exploration and use of Outer Space should be carried out for the benefit and in the interests of all Mankind.

Following this Resolution, it was involved in the following treaties, as Art. I OST establishes that Outer Space has to be considered as province of all Mankind. Furthermore, has to be

¹⁶² Rana H.S., *The Common Heritage of Mankind and the Final Frontier: A revaluation of Values Constituting The International Legal Regime for Outer Space Activities*, 26 Rutgers Law Journal (1994), 225.

¹⁶³ Ibid, referring to UN GA Res. 3201 (XXIX), Declaration on the Establishment of a New International Economic Order, 1 May 1974.

¹⁶⁵ UNGA Res. 1962 (XVIII), 13 December 1963.

mentioned that, during the drafting of the OST, was also considered the use of 'Common Heritage of Mankind', but was not retained as 'province of all mankind' was considered more closely related to the principles of freedom of Outer Space, and of non-appropriation¹⁶⁶.

Nevertheless, along with reiterating 'province of all mankind', it reiterates the non-appropriation principle but explicitly pairs it with the CHM principle. It is considered the main obstacle to states' ratification, which led to its low number of signatures today.

The Moon Agreement does not fully elaborate the CHM, or at least not as much as the UNCLOS does. It only advocates for the establishment of an international regime, with specific related goals, but does not mention any mechanisms or institutions.

Still, it further develops the implications of the CHM principles as it calls for 'equitable' sharing. This adds further uncertainty as it could be interpreted both as a way to redistribute more to developing countries because of their economic needs, or more to the industrialized states as they are the one that would invest the most in the development of space mining activities¹⁶⁷.

The implementation of the CHM principle, both in the Moon Agreement and in the UNCLOS, contributed to the emergence of two conceptions of it. The success of the UNCLOS, through the 1994 Implementation Agreement, and the failure of the Moon Agreement to reach a significant number of signatures illustrate the divergence of interpretations of the CHM principle.

4.2.2 The need to reach a unified interpretation of the CHM principle

As described through John Noyes' sliding scale of legal regimes governing the development of natural resources¹⁶⁹, there are different states' interpretations of the two zones respective regimes.

Indeed, considering Outer Space, the countries enacting national space legislation seem to consider it as a zone like the high seas, where no actor can claim having exclusive rights to resources that would preclude other from enjoying them until they effectively retrieve them.

On the other hand, the Deep Seabed regime, as it is established, is explicitly recognizing the zone being ruled by the CHM principle, therefore leading to the regime where all states participate to the resource management regime, this meaning establishing an effective regime altogether.

Still, as we saw earlier, the similarity of the two zones, and the possibility of a race to space resources excluding developing countries, call for a common interpretation of the principle ruling the exploitation of their resources.

¹⁶⁶ Wolfrum R., *Common Heritage of Mankind* (2009), *Oxford Public International Law*, Oxford, Oxford University Press.

¹⁶⁷ Moon Agreement, Art. 11 para. 7.

¹⁶⁹ Noyes J., *The Common Heritage of Mankind: Past, Present and Future* (2011-202), 40 *DENV. J. INT'L L. & POL'Y* 447 (2012).

As it is already present in the Moon Agreement, and as it is quite underdeveloped in this instrument, the most obvious solution would be to model the CHM principle found in the Outer Space legislation after the CHM as interpreted in Deep Seabed legislation.

Therefore, by considering that the CHM principle benefits of a unified interpretation, both in Outer Space and in the Deep Seabed, then could be considered that it has the same consequences in terms of legal implications in the two zones. Thus, it would lay the ground in Outer Space for the same kind of regime than in the Deep Seabed, and may, therefore, overcome the reluctance of industrialized states toward the Moon Agreement, as it happened with the UNCLOS after the adoption of the 1994 Implementation Agreement.

It is crucial to keep in mind that even though the CHM principle is it explicitly and implicitly mentioned in the founding treaties of Outer Space, it is not as essential as it is in the Deep Seabed. Subsequently, the countries party to the OST but not to the Moon Agreement shall not be seen as having adopted the view that Outer Space shall be covered by a regime similar to the one covering the Deep Seabed.

For these state parties to the UNCLOS but not to the Moon Agreement, this illustrates a differing conception of the CHM principle, and the subsequent mechanisms it entails, regarding whether it is in Outer Space or the Deep Seabed.

4.3 Of developing a Deep Seabed-inspired regime

A regime covering the exploitation of Outer Space resources could be developed under different forms. Additionally, even though it could be inspired of the Deep Seabed regime, it will still require adaptations to the specificities of Outer Space regarding space mining activities.

4.3.1 An addition to the existing treaties

As considered earlier, as the CHM principle needs to benefit from a unified interpretation, both in Outer Space and in the Deep Seabed, establishing a regime covering the exploitation of resources in Outer Space through the Moon Agreement would be a convenient option.

Regarding the Moon Agreement, because of the blurriness of the CHM principle's implications, and the regime to be established, it contains, scholars have declared it as being of no use in International Law¹⁷¹. Still, as it is also the case for the OST, the Agreement could also be

¹⁷¹ Benson J., *Space Resources: First Come First Served*, Proceedings of the Forty-First Colloquium on the Law of Outer Space (1999), 46.

amended, or see annexes containing specific provisions establishing such a regime attached to it.

This is where the low amount of signature becomes an advantage, as a consensus and the development of an international regime consequent to Art. 11 of the Moon Agreement will be easier to reach than one developed under the OST.

Of course, such an initiative will initially have a low impact because of the small number of state parties to the Agreement. However, it may gain momentum as it would nevertheless be undertaken through one of the founding International Space Law conventions.

Finally, Art. 11 para. 5 calls upon state parties to establish such an international regime when the exploitation of the natural resources on the Moon or other celestial bodies become feasible. As the situation is getting closer, it may now be seen as an obligation for such states to develop it, unregarding of the potential outcome.

Alternatively, such a regime could be developed under OST, as it is a more consensual International Space Law Instrument, and it establishes the core principles of Outer Space legislation. Indeed, shall not be forgotten that Outer Space is also ruled by principles differing from the Deep Seabed Area. Indeed, as Art. II OST reminds us: Outer Space, the Moon or any other celestial body shall not be subject to national appropriation by claims of sovereignty, by means of use or occupation, or by any other means.

Thus, arises the issue of licenses granted to private entities obtaining control over a celestial body in order to exploit its resources. If the exploitation is total and exclusive, would it not be considered as an assertion of exclusive rights over territory in Outer Space?¹⁷²

This indicates that for it not to be contradictory with the established space legislation, such a regime could be developed under the OST, as an annex to it or a new part resulting from treaty amendment, like Part XI of the UNCLOS.

Finally, such a regime could be developed as a whole new instrument. Still, it does not seem like an adequate solution.

This because the Moon Agreement and the OST already establish general principles governing activities in Outer Space. These principles seem to be sufficient to form a basis for a resources-exploitation regime; and, as with saw earlier, these principles and the term they employ already suffer from lack of clarity leading to diverging interpretations. Therefore, establishing such a regime through a new legal instrument relying on its own autonomous principles would be the best way to aggravate these issues of clarity and coherence.

¹⁷² Roth S., *Developing a Law of Asteroids: Constants, Variables and Alternatives* (2016), 54 Colum J Transnat'l L827, pp. 841-842.

Unregarding the form it takes, such development will most likely happen under the auspices of the UN. Indeed, it can reasonably be expected that UNCOPUOS will remain the privileged multilateral forum within which International Space Law legislation will be developed¹⁷³.

To conclude, it seems preferable to develop such a regime under an already existing treaty. Indeed, it would be the best way not to affect the clarity of already complex Outer Space legislation regime, made of linked and overlapping treaties and soft law acts.

Especially, developing this regime under the Moon Agreement could be a way to offer it a second chance by providing it with its own '1994 Implementation Agreement'. Plus, even though the process would be initiated by a small number of states, other states non-parties to the treaty could be invited to participate to it, as it happened during the making of the 1994 Implementation Agreement with the industrialized states.

4.3.2 Adapting to the Outer Space specificities

Barely reproducing the Deep Seabed regime is obviously not something that could be considered, as Outer Space and Outer Space activities present specificities that make them unique, and therefore different than the Deep Seabed and Deep Seabed mining activities.

In order to reach an efficient and adequate international legal regime covering Outer Space mining activities, the Deep Seabed regime shall be considered as a basic formula that then requires to be declined to adapt to Outer Space.

A specificity of Outer Space is its geographical character. Indeed, contrary to the Deep Seabed, Outer Space is infinite and evolutive. Therefore, celestial bodies susceptible of exploitation, such as asteroids, may appear or disappear. In other words, Outer Space resources once exploitable may become out of reach, and *vice versa*.

Such a characteristic has to be taken into through the functioning of an Outer Space regime. Additionally to a license-emitting and monitoring institution equivalent to the ISA in Outer Space, such an institution should also regularly map the area, evaluate its resources potential, and consider this through the allowance of exploitation licenses by modulating them regarding the worth and accessibility of these resources.

Furthermore, as seen earlier, Outer Space activities, especially space mining, are highly expensive because of the level of technology they imply to be conducted, and the inaccessibility of Outer Space. Considering how the making of the Deep Seabed mining regime was influenced by the high costs of these activities and the need for them to be followed by benefit, there is no

¹⁷³ Freeland S., For Better or for Worse ? The Use of 'Soft Law' within the International Legal Regulation of Outer Space (2011), 36 *Annals of Air and Space Law*, pp. 409-446.

doubt that such element will have to be taken into account to an even greater extent in the making of the Outer Space, as the costs incurred are way higher.

Therefore, such regime will have to be strongly market-oriented to receive the adhesion of industrialized states and their national space-mining operators.

Also, because it is less technologically and financially accessible to developing countries, Space mining has the potential to lead to an even greater situation of exclusivity, to the benefit of industrialized countries.

Therefore, while a market-oriented approach for such a regime is undoubtedly necessary to ensure its effectiveness, redistributive and technology transfer mechanisms will also undoubtedly be essential for developing countries to access space mining activities on the long-term. Indeed, the emergence of a 'space mining club' would simply counter the goals and *raison d'être* of such a regime.

Considering the implications of the CHM in the building of the regime to come, even though it is evident that it needs to be market-oriented in order to receive the adhesion of the international community, shall not be forgotten the redistributive aspects standing at the core of the principle. Following a long-term approach, establishing a two-steps regime may be a solution. Indeed, because of the financial and technological costs of space-mining activities, a market-oriented regime is essential for it to be considered suitable by the industrialized countries. However, as seen with the regime established in the Deep Seabed by the 1994 Implementation Agreement, such an approach highly reduces the redistributive implications and mechanisms initially attached to the CHM.

By establishing such a regime through an International Agreement, may be planned through such instrument the transition from a market-oriented regime, favourable to the industrialized states and their national/transnational private operators, to a more redistributive regime that would allow developing countries to access space mining activities and their benefits.

For such a transition to be deemed acceptable by the industrialized states, it will be necessary to avoid a scheme of strict redistributive or technology-transfer mechanisms that would threaten their, and their private operator's, position in the space-mining economy.

Therefore, the setting of a threshold will be needed to determine the point when such a transition will happen. Such a threshold could consist of a combination of factors such as: time elapsed since Outer Space resources effectively began to be exploited, a certain amount of benefits collected by operators from industrialized states from exploiting space resources, financial conductivity of Space mining activities, or even the amount of market shares already allowed and secured over time for industrialized states' operators.

With a balanced threshold, such as regime would not discourage operators of investing in space-mining, thus leading to normal development of an internationally regulated space-mining economy. Such a development will inevitably lead to a cheapening of the technology, allowing the conduct of space mining over, subsequently making it more accessible to a broader range of operators. Once this economy is established and stable, with insurance of profit, then the transition to a more redistributive regime could be operated, ensuring that benefits from Outer Space resources exploitation benefit to the whole international community.

5 Conclusion

From what has been written earlier, it is essential to realize that the two zones are at a different stage of their development. Indeed, the Deep Seabed has overcome the political problem arising from the initial conception of the CHM established in the 1982 version of Part XI. The exploitation of its resources is now covered by an efficient and consensual regime, which only begins to function by emitting licenses of exploitation.

On the other hand, Outer Space is still at a stage of development where it lacks consensus and prevision. The next step would be establishing an international legal regime that would adequately cover Space mining, an activity bound to happen anyway.

Therefore, hopefully, it should be considered that the Outer Space is developing in the wake of the Deep Seabed. Or, at least, that it should be aiming at.

According to this observation, the international community should attentively follow the potential problems that the ISA and the Deep Seabed regime may encounter during the development of deep seabed mining activities.

Indeed, as the regime is still young, and the exploitation process has not yet been completely undertaken, issues relating to the active exploitation of deep seabed resources by multiple operators have yet to be encountered. Additionally, the establishment of the Enterprise has yet to be done, and there are no doubts that it will be an undertaking that will lead to debates, financial and technical issues amongst the UNCLOS' signatories.

Finally, should be paid attention to the cases that could be taken to the Seabed Dispute chamber of the International Tribunal for the Law of the Sea. Indeed, could be brought in front of the chamber legal issues that may have been solved upstream by prescriptions in the International Agreements to which they relate, if considered at the time of their making.

Therefore, as the making of an international regime covering the exploitation of Outer Space resources will not be immediate; considering these potential issues would be a good way to orient and perfect the development of such a regime, for it to be as mature as possible by the time it becomes effective.

As considered earlier, a possible orientation would be to follow a two-steps regime, with an international instrument establishing first a more market-oriented regime, then giving more effect to the CHM principle.

However, such an International Agreement, only temporarily market-oriented, requires a strong will from the industrialized states to accept that the hegemony they actually have because of their financial and technological means will only be temporary. Therefore, there will undoubtedly be a conflict of interests between their political desire to be part of the development of the

international community as a whole, and their financial interests, considering that it may be more fruitful for their economies to stick to their unilateral space legislation, untouched by the CHM principle and its redistributive implications.

Such a will was non-existent when the Moon Agreement was opened for ratification, and this led to its failure. The UNCLOS was more successful thanks to the 1994 Implementation Agreement.

Nowadays, the urge to find an international compromise may lead to states being more willing to establish a consensual regime. Still, the latest developments of Space Law, involving soft law instruments, may say otherwise.

It is essential for the international community to force itself to establish such a regime, and for the legal community to push the international community to do so. In order to keep Outer Space peaceful, and to ensure that it will remain an area common to the whole Mankind, the rule of law has to be established over it in an effective manner as soon as possible. As reminded by Steven Freeland¹⁷⁵, our use of Outer Space should reflect underlying notions and share benefit, these being cornerstones of the UN *raison d'être*. That is why the CHM principle is a fundamental notion for Outer Space, and needs to remain so.

Considering the metaphor in the affirmation that 'Over time, the law of space will evolve in its own direction, and sail away from the current metaphorical relationship with the law of the sea'¹⁷⁶, one should realize that it is not about a diverging or exact transposition of an International Regime, but about the need for a common basis transcending the different zones specificities. To this purpose, the Deep Seabed regime is a candidate of choice for Outer Space.

¹⁷⁵ Freeland S., *For better or for Worse? The Use of 'Soft Law' in the International Legal Regulation of Outer Space* (2011), 36 *Annals of Air and Space Law*, pp. 409-446.

¹⁷⁶ Anderson S., Christensen K. & LaManna J., *The development of natural resources in Outer Space* (2019), *Journal of Energy & Natural Resources Law*, 37:2, p. 227-258.

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