ENHANCING THE IMPLEMENTATION OF COOPERATION AND EQUITY PRINCIPLES IN SPACE LAW FOR THE FUTURE BENEFIT OF DEVELOPING COUNTRIES

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No longer can nations, or people, live in isolation. They must come together in education and global (space) cooperation".[1]

[1] *Space Science and Microgravity Research and Their Benefits,* Third United Nations Conference on the Exploration and Peaceful Uses of Outer Space [hereinafter UNISPACE-III], A/CONF. 184/BP/6, at 4 (1998).

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ABSTRACT

Considering the importance that space applications have nowadays, this thesis aims to analyze how an equitable and responsible utilization of space natural resources can be achieved for both established and new space actors. Accordingly, the thesis will attempt to answer the question concerning whether equity in the use of space resources can only be achieved through international cooperation, and eventually how.

The first chapter will expose the legal regime surrounding the cooperation and equity principles, from the evolution of international cooperation mechanisms and instruments, to the introduction of equity as a fundamental principle in the development of Space Law. The current legal regime, some initiatives and different models regulating resource utilization in non-sovereign areas will be described in the second chapter, as to determine until which extend cooperation ensures equity. The third chapter, provides the essential elements in the creation of a new international legal regime in which the creation of an International Space Authority is deemed necessary. Finally, it is confirmed that international cooperation is key in achieving equity, but such must be achieved together with consensus, with the active role of States and with an international body that monitors and enforces compliance with the rules.

INTRODUCTION

International Law of Outer Space was born in the context of the Cold War, as an attempt to avoid that the ongoing conflict between the US and the URSS was to be moved to outer space. The creation of the *corpus iuris spatialis* marks a millstone for humanity, characterized for its progressive development and which is based in the consensus, trust and international cooperation.

Since the early 1950s, international cooperation has been a key enabler in the development strategy of most States involved in space activities. Certainly, Space Law resulted from the joint effort of States to create and strengthen the legal regime governing the activities in outer space. Countries mainly cooperate when they can obtain some benefits for the interests of their people. The level of development of each country determines its access to certain technologies, creating barriers which are overcome by complying with the cooperation principle.

Political, scientific and economic arguments ensure that international cooperation will remain as one of the pillars of outer space law. However, the new context and the challenges of the globalization era have substantially changed the nature and scope of this principle. Certainly, in the recent years new faring nations reflect their commitment to cooperate in the space sector. Further, outer space is no longer subject to the interest of developed nations, since developing countries have become part of the new actors with varying degrees of capability contributing to the development of the space industry. Additionally, the post-Cold War era is characterized for the removal of inter-bloc cooperation barriers, with new perspectives for short and long-term cooperation programs in future endeavors.

Sustainable development is a worldwide goal of the 21st century. It is a fact that planet earth is in need of alternatives to the utilization of natural resources, in order to avoid the catastrophic consequences that climate change threatens to produce on Earth. The International Resource Panel (IRP) Co-Char Alicia Bárcena adverted about the alarming rate at which materials are now being extracted and, thus, called "*for rethinking the governance of natural resource extraction to maximize its contribution to sustainable development at the global, regional, national and local levels. A prosperous and equitable world that overcomes these problems will require transformative changes in how we live our lives and how we consume materials*".[2] Therefore, many believe that space resources offer alternative sources for materials, which would support commercial applications, stimulate technological developments and contribute to economic growth.[3]

Nonetheless, in the absence of a specific regulation that binds the international community and provides legal certainty to States and its individuals, the exploration and exploitation of natural resources on the Moon and other celestial bodies have become a controversial issue. In this light, the principle of international cooperation must be implemented to preserve areas beyond national sovereignty for peaceful purposes and to promote its exploration and use.[4]

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[2] Intervention of the Co-Chair of Expert Panel on Natural Resources, Alicia Barcena, about the UNEP report. *Worldwide Extraction of Materials Triples in Four Decades, Intensifying Climate Change and Air Pollution* [Press Release] (2016). Retrieved from: http://www.resourcepanel.org/news-events/unep-welcomes-alicia-barcena-ibarra-new-co-chair-expert-panel-natural-resources

[3] Lewis, H & Lewis, R. *Space resources: breaking the bonds of Earth,* at 394 (1989)

[4] Chukeat, N. International Cooperation for Sustainable Space Development, 31 J. Space L. 315, at 328 (2005)

CHAPTER 1

REGULATORY FRAMEWORK OF THE COOPERATION AND EQUITY PRINCIPLES.

In general terms 'international cooperation' is defined as the voluntary coordinated action of two or more States working together towards a common goal.[5] The term 'international cooperation' was firstly addressed in 1970, when the United Nations General Assembly adopted Resolution 2625 (XXV) proclaiming the Declaration on Principles of International Law concerning Friendly Relations and Cooperation Among States (hereinafter the Friendly Relations Declaration) in accordance with the Charter of the United Nations (hereinafter the UN Charter).[6] According to this Declaration, international cooperation is key to achieve international peace and security, which is why States are encouraged to work effectively together in the promotion of economic growth throughout the world, especially that of the developing countries.[7]

A report of a UN-facilitated meeting of experts defines that "international cooperation is best understood as a principle and methodology",[8] and as such it is how equity may be achieved, by the general compromise of the international community in reaching a balance where all stakeholders interests are safeguarded.

1.1. The evolution of International Cooperation in International Law of Outer Space

After the World War II the term 'international cooperation' was enshrined in the UN Charter as a basis principle of international law. Article 1(3) of the UN Charter defines as one of the purposes of the United Nations "*to achieve international co-operation in solving international problems of an economic, social, cultural, or humanitarian character (…)*". This principle is essential for those legal regimes that deal with areas beyond national sovereignty.[9] For this reason, without proper regulations competition among States for economic resources and for politic control would increase, leading easily to instability or more conflict.[10]

Since the beginning of the space career, it has been worldwide recognized the great importance of international cooperation, as a crucial element in exploring and using outer space for peaceful purposes.[11] All the five space Treaties emphasize the notion that activities in outer space and any benefits that may derive from it, should benefit all countries and humanity. Hence the importance of international cooperation in achieving this purpose happens through effective interaction among different actors. This principle has been enshrined not just in all the space Treaties, but also in the UNGA resolutions concerning outer space activities.

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[5] Wolfrum, R. 'International Law of Cooperation' in Rudolf Bernhardt (ed), Encyclopedia of Public International Law, Vol 2 (North-Holland 1995) 1242

[6] UNGA Resolution 2625 (XXV) (24 October 1970) 'Declaration on Principles of International Law concerning Friendly Relations and Cooperation Among States in accordance with the Charter of the United Nations'.

[7] Ibid

[8] UNHCR 'International Cooperation to Share Burdens and Responsibilities: Summary Conclusions' (Expert Meeting, Amman, Jordan, 27–28 June 2011).

[9] Currently, areas beyond national sovereignty include the high seas, seabed, Antarctica and outer space.

[10] Chukeat, *supra* note 4.

[11] Haanappel, P. *Co-operation between Canada and the United States in Civilian Space Activities,* XII ANNALS OF AIR & SPACE L. 235 (1987).

International cooperation in outer space had a rapid beginning, developed gradually and had a dramatic transformation in the 1990s. This section studies the evolution of international cooperation mechanisms and instruments, focusing in those that represent a milestone in the development of International Law of Outer Space.

1.1.1. International Cooperation in the Peaceful Uses of Outer Space, UNGA Resolution 1472 (XIV) December 12, 1959.

The United Nations Committee on Peaceful Uses of Outer Space (COPUOS) was the first mechanism of international legal space cooperation. In 1958, after the launching of the Sputnik-I, it was first established as an *ad hoc* committee through the UNGA Resolution 1348 (XIII) to facilitate international cooperation in the study and utilization of outer space for peaceful purposes, considering that such cooperation will promote mutual understanding and strengthening of friendly relations among peoples, and believing that the development of programs of international and scientific cooperation in this field should be vigorously pursued.[12]

One year later, COPUOS was established as a permanent body and its mandate was reaffirmed in the UNGA Resolution 1472 (XIV) of December 12, 1959. This Resolution requested from COPUOS "*To review, as appropriate, the area of international co-operation, and to study practical and feasible means for giving effect to programs in the peaceful uses of outer space […]*".[13] In doing so it has maintained close relations with governmental and non-governmental organizations interested in spatial activities, providing for the exchange of information relating to outer space activities and assisting in the study of measures for the promotion of international cooperation.[14]

Besides the many critics COPUOS has received, the Committee keeps dealing with contemporary discussions and issues regarding the exploration and use of outer space which often leads in the adoption of new documents.[15] COPUOS has demonstrated that it is truly a "unique platform at the global level for enhancing international cooperation for the benefit of all countries, in particular in the area of using space applications for sustainable development".[16] Ever since COPUOS was established, international cooperation has proved to be an immutable characteristic in exploring and using outer space.[17]

1.1.2. International co-operation in the peaceful uses of Outer Space, UNGA Resolution 1721 (XVI) of December 20, 1961.

[12] UNGA Resolution 1348 (XIII) (13 December 1958) 'Question of the peaceful use of outer space'.

[13] UNGA Resolution 1472 (XIV) (12 December 1959) 'International co-operation in the peaceful uses of Outer Space'.

[14] COPUOS history. United Nation Office for Outer Space Affairs (UNOOSA) website. Retrieved from: http://www.unoosa.org/oosa/en/ourwork/copuos/history.html (Last visited 8 June, 2018)

[15] An example of this are the *Space Debris Mitigation Guidelines of the Committee on the Peaceful Uses of Outer Space* which after a multi-year discussion, were finally endorsed by the General Assembly as a way to regulate the issue.

[16] Para. 11. *Report of the Committee on the Peaceful Uses of Outer Space* to the 2007 General Assembly (A/62/20)

[17] Voronina, A. The How's and Why's of International Cooperation in Outer Space: International Legal Forms of Cooperation of States in Exploration and Use of Outer Space. *Theses, Dissertations, and Student Research in Space, Cyber, and Telecommunications Law.* 1. (2016), at. 38.

The legal principles governing space activities are first mentioned in Resolution 1721 (XVI), titled 'International cooperation in the peaceful uses of outer space'. This Resolution recognizes the importance of strengthening international cooperation in this field and commends two principles to be used as guidelines by States in the exploration and use of outer space. One principle states that the exploration and use of outer space, including the Moon and other celestial bodies, must be carried in accordance with international law. The other principle refers to that outer space and celestial bodies are free for exploration and use by all States and are not subject to national appropriation.[18]

This was the first time a Resolution recognized COPUOS as a focal point for international cooperation in outer space and for the development of international space law. Further, Resolution 1721 (XVI) recognizes that the UN must be the main element of international cooperation for the peaceful uses of outer space and, thus, invites those States that have launched or are planning to launch objects to outer space, to inform the Secretary-General in order to keep a public register of these launches. In this way, this Resolution places the concrete demands of international cooperation for the peaceful uses of outer space in three different actors: States, especially those performing space activities, the UN specialized agencies, and the UN Secretary-General.[19]

1.1.3. International cooperation in the peaceful uses of Outer Space, UNGA Resolution 1802 (XVII) of December 14, 1962.

Through Resolution 1802 (XVII), the General Assembly declares the importance of the progressive development of international law regarding: i) a further detailed elaboration of basic legal principles governing the exploration and use of outer space by all States; ii) liability for space vehicles accidents; iii) assistance to and return of astronauts and space vehicles; iv) other legal problems.[20]

In order to achieve all the proposed goals, this Resolution calls upon States to cooperate in the further development of international law of outer space, since never in the past laws pertaining to such new activities in outer space have existed. The result of international cooperation was reflected in the joint effort of States with different legal background and capabilities in space activities to make proposals that resulted in the elaboration of three of the main outer space Treaties: Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies (hereinafter the Outer Space Treaty), the Agreement on the Rescue of Astronauts, the Return of Astronauts and Return of Objects Launched into Outer Space (hereinafter the Rescue Agreement), and the Convention on International Liability for Damage Caused by Space Objects (hereinafter the Liability Convention).[21]

Further, the especial needs of developing countries in the peaceful uses of outer space, were first taken into account in this Resolution. Thus, the benefit of international cooperation was linked to the economic and social progress of these countries.

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[18] UNGA Resolution 1721 (XVI) (20 December 1961), 'International co-operation in the peaceful uses of Outer Space'.

[19] Minwen, L. Evolution from Policy towards Law: International Cooperation in the Peaceful Uses of Outer Space, 56 Proc. Int'l Inst. Space L. 621 (2013).

[20] Para. 3. UNGA Resolution 1802 (XVII) (14 December 1962) 'International co-operation in the peaceful uses of Outer Space'.

[21] The OST is considered the Constitution of Outer Space, whereas the ARRA and the LIAB, are other main treaties that govern relations among States in specific fields of spatial activities.

1.1.4. Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies, UNGA Resolution 2222 (XXI) of December 19, 1966.

The importance of this Resolution is that the policy that had served as the basis for the development of international law of outer space, is finally materialized in the first binding legal instrument: The Outer Space Treaty. Resolution 2222 (XXI) highlights the will of all States in achieving international cooperation towards developing a common understanding and in strengthening the friendly relations between States and people, in the scientific and legal aspects of the peaceful exploration and use of outer space.[22] Certainly, the Treaty itself was product of the debate between the US and the USSR that ended when both space powers assumed a spirit of great cooperativeness in which each declared its interest to incorporate in its own draft provisions not covered therein that were in the other's proposal.[23] The Outer Space Treaty provides the legal framework and the legal basis for space activities, establishing the fundamental principles that guide the progressive development of international space law. As such, the Treaty deals with the principle of international cooperation in the following articles:

- **i.** Article I provides that the use of outer space shall be carried out for the benefit and in the interest of all countries, irrespective of their degree of development. Further, it grants the freedom of scientific investigation in outer space in order to promote international cooperation and understanding.
- **ii.** Article III established that space activities shall be carried in accordance with international law, including the UN Charter, in the interest of promoting international cooperation.
- **iii.** Article V indicates the cooperation that must be carried out to protect the life and health of astronauts.
- **iv.** Article IX qualifies it by the element of mutual assistance and due regard for the corresponding interest of other States. Its connection with Articles I and III is more evident as it is linked with the principle of free exploration and use of outer space and recognizes the importance of resorting to some form of international cooperation since without it many States Parties to the Outer Space Treaty cannot participate actively in the peaceful space exploration and research.

  Furthermore, international cooperation imposes in Article IX the obligation of precaution and of international consultations. Regarding the former, States have to avoid harmful contamination and adverse changes in the environment of the Earth resulting from the introduction of extraterrestrial matter, and adopt appropriate measures for this purpose. According to the latter, if a State believes that an activity or experiment planned by it or its nationals in outer space would cause potentially harmful interference with activities of other States Parties in the peaceful exploration and use of outer space, it shall undertake appropriate international consultations before proceeding with any such activity or experiment.
- **v.** Article X calls for international cooperation upon the request by other State Parties to observe the flight of space objects launched. The terms and conditions of such opportunity are defined by an agreement between the concerned parties.
- **vi.** Article XI promotes international cooperation, by States Parties sharing information regarding their national space activities with the UN, the general public and the scientific community.

[22] UNGA Resolution 2222 (XXI) (19 December 1966) Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies.

[23] Cheng, B. *Studies in International Space Law* (1997), at 222.

In general, the Treaty provisions underline that in the exploration and use of outer space, States shall be guided by the international cooperation principle which gives to it the status of a fundamental principle in conducting activities in outer space.

These provisions seek to ensure that all States access to outer space, guarantying its exploration even for those who have yet neither the resources nor the technology for reaching it physically, and to raise awareness within the space faring nations about other actors willing also to explore and use outer space and its resources. In doing so, the Outer Space Treaty confirms the value of international cooperation as one of the principles governing activities in outer space, conceiving it as the final purpose or goal of the process, acknowledging the existence of different cooperative mechanisms, providing the appropriate regulation, and elaborating the ways this principle should operate in outer space activities.[24]

In conclusion, the scientific and legal aspects of outer space resulted from international cooperation, which at the same time has helped to maintain peace in outer space. The Outer Space Treaty establishes international cooperation as one of the main principles to which States have to adhere in performing space activities.[25] As such, its provisions forms the basis for international cooperation in outer space but it is never established as a concrete unconditional legal obligation under which activities in outer space cannot be conducted.

1.1.5. The Moon Agreement

The benefits States can get from the Moon and other Celestial bodies were enough reason to join efforts in drafting the Moon Agreement back in 1979. Regarding the principle of international cooperation, this Agreement aims to promote, on the basis of equality, the development of cooperation among States in the exploration and use of the Moon and other Celestial Bodies.[26] As such, the Moon Agreement calls for international cooperation in the following articles:

i. Article 2 calls again for international cooperation in all activities on the Moon, including its exploration and use, and makes reference to the Friendly Relation Declaration and the UN Charter as evidence of generally accepted principles of international law which through which peace and security in outer space and on celestial bodies can be preserved.27
ii. Article 4(2) requests States Parties to strengthen international cooperation either on a bilateral or multilateral basis, and especially through international intergovernmental organizations, considering the high costs and the benefits that space activities entail for mankind.28
iii. Articles 12, 13 and 15 reemphasize the importance of international cooperation for humanitarian purposes and for the availability of the information in case of an accident.

All in all, these provisions recall the same principles contained in the Outer Space Treaty in the exploration and use of the Moon and other celestial bodies, and in that sense do not add anything that

[24] Voronina, A. *Supranote* n. 17 at 30.

[25] Piradov, A. International Space Law (Progress Publishers, Moscow 1976) 45, text originally in Russian: Mezhdunarodnow kosmicheskoe prao (Moscow 1974) 45 at. 62.

[26] Diederiks-Verschoor, K, & Kopal, V.*An introduction to space law* (3rd rev. ed.). Alphen aan den Rijn: Kluwer Law International (2008)

[27] Hobe, S. *Cologne commentary on space law. Vol. 2: Rescue agreement, liability convention, registration convention, moon agreement.* Köln: Heyman (2013) at 357

[28] Ibid, at 365.

the Outer Space Treaty has not addressed before. A further analysis of the Moon Agreement will be done in Chapter 2 as to understand its strengths and shortcomings to further determine how this provisions aimed to guarantee international cooperation and equity in activities in outer space.

1.1.6. Declaration on International Co-operation in the Exploration and Use of Outer Space for the Benefit and in the Interest of All States, Taking into Particular Account the Needs of Developing Countries, UNGA Resolution 51/122 (13 December 1996)

Treaties, declarations and resolutions that followed the Outer Space Treaty developed and clarified the principles governing activities in outer space. Even when this instrument is considered a mere declaration of intent that lacks binding force, within the international community it is considered to be the general framework for international cooperation,[29] as this section aim to describe. In 1988, after failing to defend their interests in the existing body of space law, the developing countries joined forces and presented a new agenda item in the Legal Subcommittee of COPUOS:

> *"Consideration of the Legal Aspects Related to the Application of the Principle that the Exploration and Utilization of Outer Space should be Carried Out for the Benefit in the Interest of all States Taking into Particular Account the Need of Developing Countries"*[30]

This item led to the presentation of a working paper containing a set of principles which, as Benkö affirms, was characterized by a heavy language imposing a New International Order aiming at forced cooperation and an automated transfer of financial and technological resources from North to South.[31]

The aggressive tone of this working paper resulted in the refusal by industrialized countries to discuss such text.[32] During the four sessions from 1991 to 1994, the spacefaring nations promoted a new tone for the debate, recognizing the real participation of some developing countries in space projects. The adoption of the 'Declaration on International Cooperation in the Exploration and Use of Outer Space for the Benefit and in the Interest of All States, taking into Particular Account the Needs of Developing Countries' (Declaration on Space Benefits), recognizes the growth of space cooperation and the importance for strengthening international cooperation. It is a Declaration highly influenced by the situation of developing States, which is why it emphasizes in that space exploration and use must be carried out for the benefit and in the interest of all countries, irrespective of their degree of development.

Further, this Declaration calls upon all the participants to consider the appropriate use of space applications and the potential of international cooperation for reaching their development goals. implement national and international agencies and organizations.[33] It also supports the efforts and role of the COPUOS, and finalizes by requesting States to support the UN Space Application Program.[34]

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[29] Benkö, M. Schrogl, K. *Space Law at UNISPACE III: Achievements and Perspectives*, 49 ZLW 74 (2000).

[30] Scholars believe that the long text of an agenda item can elicit controversy among the interested parties.

[31] Benkö, M. & Schrogl, K. *The 1996 UN-Declaration on 'Space Benefits' Ending the North-South Debate on Space Cooperation* in Proceedings of the Thirty-Ninth Colloquium on the Law of Outer Space October 7-11, 1996, Beijing, China (1996), at 230

[32] Ibid

[33] Para. 6. UNGA Resolution 51/122 (13 December 1996) 'Declaration on International Cooperation in the Exploration and Use of Outer Space for the Benefit and in the Interest of All States, Taking into Particular Account the Needs of Developing Countries', UN Doc. A/RES/51/122.

[34] Ibid, para. 7 & 8.

Further, it represents the end of the 'forced cooperation and transfer of resources' view set earlier by developing countries. Also, it is believed to have influenced the outcome of UNISPACE III as the conference focused on the benefits that space applications could provide for all mankind.[35]

The importance of the Declaration lies in that it provides the main rules under which space cooperation should be conducted in order to facilitate the exploration and use of outer space by more countries. Even though by that time there were emerging space actors from developing countries, the Declaration maintained the gap between developed countries with relevant space capabilities versus developing countries with particular needs.[36] As opposed to the initial view by developing countries, the agreed text does not force cooperation and instead fosters it through a developed net of space cooperation, in which the spacefaring nations must not forget to integrate the developing countries into spatial activities. It is perhaps the first instrument in which international cooperation is linked with equitability. Certainly, it indicates that international cooperation shall be carried on an "equitable and, mutually acceptable basis", meaning that developing countries with interests in exploring or using outer space have now the incentive of becoming active space actors as the space community is willing to cooperate, without depending just on how accessible certain technology is.

1.1.7. Conclusion

All these mechanisms recognize that the wide scope and benefits of activities in outer space make it an optimal scenario for international cooperation. Further, through time they acknowledged the importance to achieve a global commitment for a responsible and fair use of outer space. While the Outer Space Treaty constitutes the first and most important international legal basis for international cooperation in space activities, as discussed, there are a number of non-binding instruments that try to fill the gaps that the five space Treaties failed to address. Such instruments, often referred to as 'soft law', do not oblige States but can be perceived as recommendations in the exploration and use of outer space. Soft law can serve to pursue agreement between States in areas where the law may be settled.[37] Considering that in the last thirty-nine years not a single treaty has reached consensus within the COPUOS, the contribution of soft law to the development of international space law has gain importance.

The instruments discussed in this section represent mechanisms of cooperation, however, it is yet not clear how this international cooperation should be addressed. On the one hand, the mandate could concern cooperation in the regulatory area. That is to say, whether these resolutions should aim to promote the establishment of regulatory frameworks or even 'soft law' rules that enhance foreseeability and better guide the activities of the interested States. On the other hand, the mandate could refer to cooperation in certain projects or programs, which would entail specific contractual arrangements to ensure the project is carried out within the expected legality.[38] Even when its role seems not clear, at the fifty-third session of the COPUOS Legal Subcommittee, international cooperation was perceived as a necessary basis for dealing with new challenges, such as ensuring long-term

[35] Benkö, M & Schrogl, K. Supranote 31, at 233.

[36] Jimenez, C. Legal and Institutional Aspects of Latin-American Space Cooperation. AQUARELS at: The Water Monitoring Constellation. Doctoral Thesis. Leiden, 2010, at 130.

[37] Abbott. K and Snidal, D. "Hard and Soft Law in International Governance", International Organization 54, no. 3 (2000) 421–456.

[38] Voronina, A. *Supranote* n. 17 at 10.

sustainability of space activities and promoting peace and security in order to enable sustainable development of all countries.[39]

Even when a lot has been said about transforming the role of COPUOS,[40] it is a fact that it is still the only institutional system operating on an intergovernmental level supported by the UN machinery, as it was designed to be the center of international cooperation in the exploration and use of outer space for peaceful purposes. Further, at its sixty-first session, the Subcommittee noted its instrumental role in the development of the legal regime governing the use of outer space activities for peaceful purposes and in efforts to provide a unique multilateral platform at the global level for enhancing international cooperation for the benefit of all countries.[41]

1.2. Equity in International Law.

Through equity the view that law exists for the sake of law can be replaced with the view that law must serve the needs of mankind, which has enhanced the creation of rules designed to avoid injustice.[42] Equity is a complex concept to address as it entails notions of fairness and impartiality.[43]

Article 2 of the UN Charter gives States a special legal status based on the principle of the sovereign equality of all its Members, which aims to diminish and moderate the asymmetries between them. The International Court of Justice (ICJ) role is to settle, according to international law, legal disputes submitted to it by States.[44] Considering that the international community lacks of a legal regime regulating International Law, and of a judicial organ settling whole conflicts, Article 38 of the Statute of the ICJ becomes relevant as the starting point regarding the sources of International Law. However, the five distinct sources listed in the abovementioned Article represent an incomplete list, since it was built upon a strictly jurisdictional perspective and which was drafted more than 90 years ago, without taking into account the progressive development of International Law.[45]

In this sense, Kaczorowska proposes equity as an incidental source of International Law, which can be interpreted both under Articles 38(1)(c) and 38(2). In the *Gulf of Maine Case,*[46] the Court held that while a decision *ex aequo et bono* would allow a Court to examine socio-economic and political considerations, equity within Article 38(1)(c) would involve the Court in taking a decision on the basis of legal reasoning.[47] Accordingly, whenever a tribunal has certain margin of discretion equity may be used as a method for infusing elements of reasonableness and 'individualized' justice.[48]

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[39] Draft Report of the United Nations Committee on Peaceful Uses of Outer Space Legal Subcommittee, 53rd session, 24 March – 4 April, 2014, para. 29. A/AC.105/C.2/L.294/Add.2.

[40] Schrogl, K-U. *Is UNCOPUOS Fit for the Future: Reflection at the Occasion of the 50th Session of its Legal Subcommittee 2011*, 60 ZLW 93 (2011), at 93.

[41] Final Report of the United Nations Committee on Peaceful Uses of Outer Space Legal Subcommittee, 61st session, 20-29 June, 2018, para 23. A/AC.105/1177

[42] Christol, C. Equity and International Space Law, Proc. on L. Outer Space, at 271 (1990)

[43] Oxford dictionary. Retrieved from: https://en.oxforddictionaries.com/definition/equity (Last visited: 1 July, 2018)

[44] International Court of Justice. Retrieved from: http://www.icj-cij.org/en/court (Last visited: 16 June, 2018)

[45] Kaczorowkska, A. Public International Law, Third edition. Routledge Cavendish (2015), at 27.

[46] [1984] ICJ Rep 165

[47] Kaczorowkska, A. *Supranote* n. 45, at 56

[48] Francioni, F. Equity in International Law, Max Planck Encyclopedia of Public International Law. Retrieved from: http://www.mpepil.com (Last visited: 16 June, 2018)

1.3. Equity in International Space Law.

As Schrogl affirms, equity and fairness are two concepts enshrined in specific provisions of the Outer Space Treaty (i.e. Article I) and in single issue regimes such as the use of the GSO (i.e. the *a priori* planning procedure of 1988)[49]. The term 'equity' has raised some concerns regarding how such principle, and values associated to it, should be applied to activities in outer space, especially in the context of resource utilization. As Christol affirms, the main difficulty lies in the abstract nature of *equity*, which is based on fairness as justice[50]. Certainly, it does not represent an absolute standard and instead it is relational and depends of a specific context, in which the obtained reward is proportionate to the effort, contribution or investment.

Further, it is not clear how to understand the fact that Article I of the Outer Space Treaty declares that the benefits derived from spatial activities are "*for the benefit and in the interests of all countries (…) and shall be the province of all mankind".* These two statements in the same Article entail an inconsistency since it is not clear under which standards it is defined that equity preferences are given to a specific group, whereas equality of treatment is recalled for another.

Moreover, there is still a common misconception that equity and equality mean the same, leading to use both terms interchangeably.[51] The latter may found its reason in the fact that through time equity has been invoked in relation to different roles. In fact, as it was addressed in Section 1.2., potential roles appoint equity comparable to justice and fairness, to decisions *ex aequo et bono*, to a general principle of law, and it has been even used as a procedure itself.[52] Further, equity is a notion that has been invoked by General Assembly resolutions and other instruments as a synonym for distributive justice within the demands of developing countries for redistribution of wealth as part of a New International Economic Order.[53]

The foregoing considerations will explain the context in which equity was firstly addressed in outer space law, which will clarify the exact role this term has had in space activities. It will be proposed that in order to achieve equity in space activities, all involved actors must be treated fairly according to their circumstances *(Figure 1).* Therefore, the value of equity will require its transformation from a broadly stated goal of fairness and justice to a specific outcome in practical situations.[54]

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[49] Schrogl, K-U. The concept of space traffic management as a basis for achieving the fair and equitable use of outer space. In: Rathgeber W., Schrogl KU., Williamson R.A. The Fair and Responsible Use of Space. Studies in Space Policy. Vienna (2010) at 140

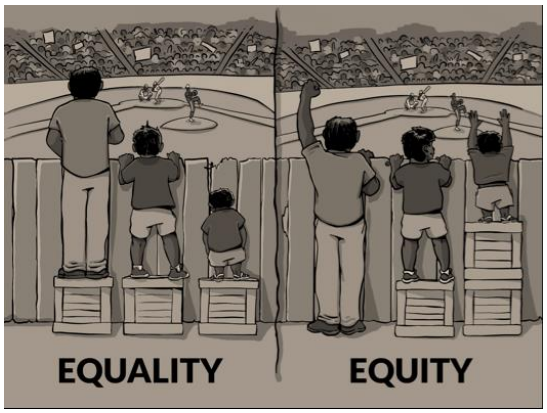
[50] Christol, *supra* note 42, at 270

[51] Tronchetti, F. *The Management of International Areas and their Limited Natural Resources: the examples of Antartica and ITU*. In: The Exploitation of Natural Resources of the Moon and Other Celestial Bodies: A proposal for a Legal Regime, at 179 (2009).

[52] McIntyre, O. Utilization of shared international freshwater resources – the meaning and role of "equity" in international water law, Water International, 38:2, 112-129 (2013)

[53] Boczek, B. International Law: A Dictionary. Dictionaries of International Law No. 2. The Scarecrow Press. Toronto, at 8 (2005)

[54] Ibid.



Source: Interaction Institute for Social Change

1.3.1. The progressive development of equity within the Space Law Treaties.

Even when the Outer Space Treaty is explicit about the equality among States, some scholars believe that equity was implicitly enshrined by means of Article I of the same instrument[55]. Even when Article I(1) of the Outer Space Treaty proclaims equitable rights to the exploration and use of outer space to all States irrespective of their degree of economic or scientific development, no guidance is provided on how States would receive the benefits derived from other State's space activities. Notwithstanding, the 1972 Liability Convention preamble seems to displace until some respect equality by considerations of equity.[56] Certainly, it is recognized as the objective of the agreement "*to obtain a full and equitable measure of compensation to victims of such damage*"[57] and further, on its Article 12 is reasserted that the payment of compensation will be "*in accordance with international law and the principles of justice and equity"*. This provision represents just an attempt to ensure that compensation was to be paid, but lacks of clarity since it is ambiguous what should be understood as just and equitable in the context of damages.[58]

Four years later, Article VI of the 1976 Convention on Registration of Objects Launched into Outer Space (hereinafter the Registration Convention) calls States Parties to the agreement to assist other State Party in providing the information on the identity of a space object "*under equitable and reasonable conditions".*

However, in 1979, the alleged wide acceptance of equity was compromised by the Moon Agreement in which, together with the Common Heritage of Mankind formula, the benefits derived from space natural resources were established to be subjected to *"an equitable sharing by all States Parties".* In doing so, the Moon Agreement, recognized that "*the interests and needs of developing countries, as well as the efforts of those countries which have contributed either directly or indirectly to the exploration of the Moon*" require special consideration.[59] Since these factors must be taken into account by the signatory Parties to this Agreement in the utilization of space resources, it became problematic how this equitable sharing of benefits was meant to happen, which is the main reason why, as at June 2018, this

[55] Schrogl, K-U. *Supra* note 40.

[56] Christol, C. *Supra* note 42, at 272.

[57] Preamble of the Liability Convention.

[58] Christol, C *supra* note 42, at 273. The author affirms that States were unable to consolidate the different proposals in a single one with a concrete formula.

[59] Article 11(6)(d)

instrument has been ratified just by 18 States. As stated before, Chapter 2 will elaborate on this as a case-study.

1.3.2. Equity in the International Telecommunications Union (ITU)

The origin of the equity principle in International Law of Outer Space is also linked to the early 1960s, when developing countries started the debate of a fair access to the Geostationary Satellite Orbit (GSO). As the satellite industry started to evolve, developing countries exerted political pressure within the ITU and its radio conferences to prevent the economic and social development turn against them in the access to this orbit.[60] Throughout the time, depending on the situation and context, the ITU regime has addressed three different approaches to the term equity: equitable use, equitable access and equitable planning.

First, the term was initially applied to the radio spectrum during the 1963 Extraordinary Administration Radio Conference, after developing countries expressed their concern about the then existing policy of *a posteriori* allocation in respect of the Radio Frequency Spectrum and the GSO. As the outcome of the Conference, the principle of the equitable and rational use of the radio spectrum was established in Recommendation 10A,[61] but the position of developed countries in managing the Orbit Spectrum Resource (OSR) under an *a posteriori* approach prevailed. Later on, the 1971 World Administrative Radio Conference (WARC) adopted Resolution 2-1, which extended the policy by calling for the equitable use of frequency bands allocated to space services and of the geostationary orbital position. However, this Resolution is a clear example of the confusion referred to at the beginning of Section 1.3. Certainly, Resolution 2-1 addressed that such use should be available to "all countries with equal rights", conjoining two entirely separate and inconsistent policy objective.[62]

Second, regarding the equitable access, during the Plenipotentiary Conference of 1973, Article 33 of the ITU Radio Regulations became the first binding legal instrument addressing that equitable access to the GSO was to be granted to all countries, assuring somehow to developing countries they would not find all positions gone by the time they decided to carry a launch.[63] In the 1979 WARC, Resolution 3 called for a two-part conference on 1985 and 1988, with the purpose "*to guarantee in practice for all States equitable access to the geostationary-satellite orbit and the frequency bands allocated to space services*".[64] The outcome of the two sessions WARC signified the most successful development of the equity principle in the use of the GSO, in which all States were granted an orbital position and frequency for telecommunications purposes. Since there was no time restriction set to access to an allotment plan, this new procedure benefited especially developing countries.[65]

Finally, the equitable planning was a central discussion during the 1977 WARC regarding the Planning of the Broadcasting-Satellite Service (BSS), in which the first step towards liberalizing the use of the Orbit Spectrum Resource was made.[66] It was decided to establish an *a priori* allotment plan for

[60] Tronchetti, F, *supra* note 51, at 164

[61] Talaie, F. Legal Issues Concerning the Radio Frequency Spectrum and Geostationary Satellite Orbit. Australian International Journal, at. 50 (1998)

[62] Christol, *supra* note 42 at 273

[63] Tronchetti, F. *Legal aspects of satellite communications.* In Von der Dunk, F. Handbook of Space Law (2015) at 481

[64] See *Final Acts*, World Administrative Radio Conference, Geneva, 1979, RESPB-1.

[65] Tronchetti, F. *Supra* note 51, at 181

[66] Ibid at 175.

the BSS, attributing to each member of the ITU a geostationary slot and frequency in Regions 1 and 3.[67] The *a posteriori* and *a priori* ITU mechanisms for sharing the orbit spectrum resource are further addressed in Chapter 2.

1.3.3. Conclusions

All in all, cooperation among developing countries made major contributions to international telecommunications policies, in order to protect themselves of being excluded from the benefits of the globalization era. In doing so, they secured their use and access to the GSO and frequency bands, while challenging the main principles governing outer space. Ever since, the high status of the equity principle has been represented in the drafting of Article 38 of the Statute of the International Court of Justice, in the UN Charter's provisions, and in many instruments of space law.

Even when the origin of the UN Space Treaties and the ITU Radio Regulations was marked by the principle of equality, both areas have addressed until some extent the principle of equity. On the one hand, the Space Treaties expressly established the equal use by all States of the space environment and, twelve years later, the Moon Agreement recognized the need of an equitable sharing of benefits derived from the utilization of it and its natural resources. On the other hand, and even though the ITU has tried to reach equity standards, this has been done so far towards the planned allotments, which do not grant the same capacity than the non-planned ones[68]. Nonetheless, it is clear that the process has involved a serious commitment from all the stakeholders, which means that such success could be transposed to the issue regarding the utilization of space natural resources. The next chapter aims to analyze such issue exposing the urgency of a clear and global binding regime.

[67] Radio Regulations. For the allocation of frequencies, the world has been divided into three Regions.

[68] Pérez, M. A satellite and the solution to the telecommunications issue in Colombia. (Undergraduate Thesis). University of Los Andes. Retrieved from: https://derecho.uniandes.edu.co/images/stories/programas_academicos/Espacio_Ultraterrestre/t_perez_manuela.pdf (2017) (Last visited 20 June, 2018)

CHAPTER 2

CASE STUDIES FOR FUTURE PERSPECTIVES

The interest of spacefaring nations such as the United States, Russia and China for outer space resource utilization keeps growing since in the recent years it has been discovered the precious value of space minerals when used on Earth. According to Bob Richards, CEO of Moon Express "*We know that there's water on the Moon, which is a game-changer for the solar system. Water is rocket fuel. It also can support life and agriculture. So exploring the Moon commercially is a first step towards making the Moon part of our world, what humanity considers our world*".[69] Furthermore, other companies such as Deep Space Industries, Orbital Science and Blue Origin, are building autonomous spacecraft that can extract materials from asteroids as they constitute they may an inexhaustible reserve of minerals and elements that begin to be scarce in our planet.[70]

Considering that most of the technological discoveries have occurred in the last decades, it is possible to state that a legal regime regulating drafted forty to fifty years ago, happens to be insufficient to regulate the new challenges in the exploration and utilization of space natural resources. Firstly, this chapter analyzes the current legal provisions governing resource utilization as to determine which elements of such regimes can be used in developing through international cooperation a clear binding legal framework in which equity is granted. The second part of this chapter will study the role of international cooperation and equity as addressed by The Hague Space Resources Governance Working Group, and in the case of the high seas and the ITU in the management and utilization of natural resources, as to discover which elements of such proposals can be transposed to that binding legal framework while achieving a balanced resource management in outer space.

2.1. The utilization of space natural resources under the existing regulatory framework.

The protection of the environment and all its resources was first raised in the XX century. Hence, in the XXI century the concern of misusing or breaching the fundamental principles governing outer space responds to the latent threat that climate change has perpetrated between States.[71]

This Section expose how the current legal regime approaches the issue of the utilization of space natural resources and whether the principles of international cooperation and equity have played an important role. Therefore, the purpose of this work is not to consider the different discussions surrounding the non-appropriation principle, but to understand the need of having a clear set of binding norms regulating such exploitation of resources in light of the principles of international cooperation and equity.

2.1.1. The Outer Space Treaty

[69] Morris, R. What if you could mine the Moon? *BBC News.* (13 March, 2013). Retrieved from: https://www.bbc.co.uk/news/magazine-21685995 (Last visited 8 July, 2018)

[70] Tynan, D. Galactic gold rush: the tech companies aiming to make space mining a reality. *The Guardian.* (December 6, 2016) Retrieved from: https://www.theguardian.com/science/2016/dec/06/space-mining-moon-asteroids-tech-companies (Last visited 8 July 2018)

[71] Gómez, S. Space Natural Resources: Proposal for a new legal regime regulating the exploration and exploitation of natural resources in the Moon and other celestial bodies. [Text originally in Spanish] (Undergraduate Thesis) University of Los Andes. Retrieved from: https://derecho.uniandes.edu.co/images/stories/programas_academicos/Espacio_Ultraterrestre/tesis_los_recursos_naturales.pdf (2017) (Last visited: 8 July, 2018)

As it was addressed in Chapter 1, the Outer Space Treaty represents the Constitution of outer space, under which space activities are regulated. Since its entry into force, this Treaty has fostered a successful period of peaceful, cooperative and progressively innovative space exploration and use of outer space.

The 'province of all mankind' concept enshrined in Article I, prescribes that the exploration and use of outer space must be carried out for the benefit and interest of all countries, irrespective to their degree of economic or scientific development. Considering again the context in which this Treaty was discussed, this statement aimed to represent and obligation to developed States to ensure that any activity conducted in outer space benefits all countries, irrespective of how far they are of achieving a spacefaring nation status. Regardless of their status quo as spacefaring nations, developing countries played a crucial role in the drafting of this Treaty. Certainly, among other States, the Brazil representative proposed the insertion of "*irrespective of their degree and scientific development*".[72] This provision states that though all nations have a common stake in the resources found within the province of space, only a few are in a position to utilize them.[73] Therefore, it protects not just developing countries directly involved in space activities, but also all States through the idea that space exploration and use is to be conducted "for the benefit" and "in the interest" of all mankind.[74]

However, the '*province of all mankind*' term has raised some discussions as it is yet not clear its obligatory nature. Some authors point out that this concept entails just a moral obligation without imposing any legal obligation since Article 1 does not develop how the exploration and use of outer space in the interest of mankind should take place nor how States should share the benefits derived from such activities.[75] Other views appeal to the *travaux preparatoires*[76] of the Treaty and UN Resolutions 1721 and 1962, and recognize them as instruments with binding nature which create a legal obligation to explore and use outer space for the common interest of all mankind. Trying to conceal both views, the Outer Space Treaty is not sufficient on providing the way in which countries may benefit of the activities conducted by another State in outer space. It is unclear if the State performing space activities would be obliged to share the collected resource, or to share the profit it collects out from the resource or even provide the benefits out of such resource to all countries, or if such share should be equal or equitable. Further, there is no certainty on who or what manages or prevent States from utilizing and consuming outer space resources without due regard to resource rationing and from turning such area and resources into a profit.

On the other hand, Article II of the Outer Space Treaty deters nations from extending their territorial rights over outer space, meaning that no public or private property was ever to be claimed therein. However, the future applications of space technologies were not foreseeable by the time the Outer Space Treaty was drafted. In recent years, private actors have shown their interest and commitment in reaching outer space for commercial purposes which is still a matter of debate. This is important since the 'use' of outer space may refer either for scientific or commercial reasons, being the latter not prohibited but read together with Articles I, III and IX of the OST. That is to say that States are required to explore and use outer space for the benefit and in the interests of all countries, to carry on

[72] Dembling, P. & Arons, D. *The evolution of the Outer Space Treaty*, J. Air & L. Comm 33 (1967), at 425

[73] Chan Sek Keong, "Opening Address," in Space Law Conference 2001, Singapore (March 2001).

[74] Tronchetti, F, *supra* note 51, at 63

[75] Tronchetti, F, *supra* note 51, at 24

[76] Under Art. 32 Vienna Convention, 'supplementary means of interpretations' entail the preparatory work of the treaty and the circumstances of its conclusions, when the meaning of a provision is ambiguous or obscure.

their space activities in accordance with international law, and to avoid potentially harmful interference with other States' activities.[77]

Opinions are divided regarding the applicability of the non-appropriation principle, one referring to celestial bodies and other extending it to its natural resources. One view holds that States are entitled to appropriate them as long as their activities are not contrary to Art. IX OST, meaning that the activities do not involve any permanent claims or authority over the areas in which the resources are being appropriated, and without preventing other States from doing the same.[78] Other scholars consider that the non-appropriation principle applies to outer space and its natural resources, since the Treaty never made distinction between outer space and its natural resources[79]. In brief, regarding the utilization of space resources, it remains unclear under this regime whether claiming property rights over the Moon or other celestial bodies' natural resources is allowed.[80]

In summary, even though Article I provides the freedom in exploring and using outer space and to perform scientific investigations on any area of a celestial body, it fails to set a clear definition of the term 'use' and whether its scope entails exploitation, utilization of resources, the management of the benefits from space activities, and the establishment of an authority supervising that those activities are in conformity with the Treaty.

Further, the ambiguity of Article II has led to broad interpretations as it can be seen in activities like telecommunications and remote sensing in which the imminent needs of mankind justifies the establishment of specific and unique guidelines. Hence, until a new binding legal instrument is adopted to address such vagueness of terminology the right of using outer space resources for exploitation or scientific investigation may be a valid option opened to all States, which could jeopardize States benefitting from activities carried out in outer space. Since such international authority does not exist, Section 2.2 will provide recommendations on the principle of such forum regarding how this kind of institutions have played an iconic role in similar scenarios.

2.1.2. The Moon Agreement

The voids of the Outer Space Treaty regarding outer space utilization are enough reason to understand why since 1970 the drafting of the Moon Agreement aimed to develop provisions relating to the exploration and utilization of outer space and its resources.[81] Surprisingly, as of July 2018 only eighteen States have ratified the agreement, from which none is a spacefaring nation engaged in manned exploration missions, making its binding force unsuccessful.[82]

During the 70s the world was experiencing the endeavor of developing countries in reaching a new international economic order in which equal participation was granted. The discussion of a new Treaty (The United Nations Convention on the Law of the Sea) to regulate natural resources in areas not subject to national sovereignty, was the ideal forum to address obligations such as the mandatory

[77] Tronchetti. F. *Supra* note 51, at 224.

[78] Ibid at 221

[79] See, for example, Gorove, S. *Limitations on the Principles of Freedom of Exploration and Use in Outer Space: Benef ts and Interests*, in Proceedings of the XIII Colloquium on the Law of Outer Space, (1970)

[80] Ibid.

[81] Hobe, S. *Supra* note 27 at 342.

[82] The aim of this section is not to discuss the different views regarding the binding character of the Moon Agreement, but to address its real legal impact as an important doctrine of space law.

transfer of technology from developed to developing States as part of the *common heritage of mankind* philosophy.[83] Its outcome was a regime for the international administration of an area in which States could freely use and were the deep seabed was the '*common heritage of mankind,*'[84] and which will be discussed in Section 2.2.

During the negotiations of the Moon Agreement, developing countries proposed either that launching States with the capacity to exploit celestial bodies were meant to share the benefits resulting from such exploitation with those lacking such aptitude, or to guarantee to future launching States, coming from developing countries, that resources would be available by the time they reach outer space.[85] This means that ever since the 70s it was foreseeable the possibility of space faring nations taking advantage of their position to ignore fundamental principles such the non-appropriation one. These fears delayed the negotiations for eight years, until the UN General Assembly approved it through Resolution 34/68 of December 5,1979.

The aims once sought by the Moon Agreement are gaining back importance in the international community since the States and private actors are eager to develop commercial activities with space natural resources.[86] Some scholars believe that the low number of ratifications of the Moon Agreement is a consequence of its Article 11 which establishes that the Moon and its natural resources are the common heritage of mankind and therefore cannot be subject to national appropriation and for providing that States will have an equitable participation in the benefits resulting from those resources.[87]

To understand the strengths and shortcomings of this agreement, and for the purposes of this work, the Articles 4, 6, and 11 will be analyzed regarding the feature of Common Heritage of Mankind, as to understand why this Treaty is an [failed] attempt to guarantee international cooperation and equity in activities in outer space. especially due to the lack of clear definition of the concepts they address.

Article 4

The first approach in this analysis should refer to the content of Article 4 as it recalls the common province clause as established in Article I of the Outer Space Treaty but in a much stronger way with the idea of intergenerational equity, as it introduces an environmental element to the concept of the province of all mankind.[88] Thus, intergenerational equity is introduced as a unifying theme that aims to join developed and developing countries to deliver a framework of international cooperation which considers the interests of each of them.

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[83] Hobe, S. *Supra* note 27 at 390. Such aims did not succeed as the *common heritage of mankind* approach was considerably changed for a more liberal meaning and scope.

[84] Ibid

[85] Mayorga, M, Peinado, Juan. Jornadas Latinoamericanas de Derecho Aeronáutico y Espacial [Latin American Conference of Aeronautical and Space Law] Málaga et al., Nuevos Enfoques Del Derecho Aeronáutico Y Espacial [New Approaches to Aeronautical and Space Law]. Marcial Pons, Ediciones Jurídicas y Sociales (2015), at 422

[86] Stephan, H. *Moon Agreement - Let's Use the Chance, The / The Moon Contract - A New Beginning / Le Traite de la Lune - Profitons of Chance*, 59 ZLW 372, 381 (2010)

[87] *See* Mayorga, M, Peinado, Juan., *supra* note 85; UN Doc. A/AC.105/891, Report of the Legal Subcommittee on its Forty-Sixth Session (26 March – 5 April 2007), Annex I, Report of the Chairman of the Working Group on the Status and Application of the Five United Nations Treaties on Outer Space, 2 May 2007; Von der Dunk, F. "The Moon and the Prospect of Commercial Exploitation of Lunar Resources," Annals of Air and Space Law Vol. XXXII (2007): 101

[88] Intergenerational equity has been developed as the main focus of the concept of sustainable development, and in that sense sustainable development has been defined as one meeting the needs of the present without compromising the ability of future generations to meet their own needs.

Article 6

Unlike the Outer Space Treaty, Article 6 of the Moon Agreement explicitly allows States to collect and remove samples of minerals and substance from a celestial body and declares that States shall have regard in making a portion of such samples available to other interested States Parties and the international scientific community. However, the wording of this provision does not set an obligation to share the resources they collect as it does not stipulate that they 'shall share' them. Further, the same vagueness is perceived from the right given to Member States to use such resources in '*quantities appropriate'* because it is not clear the limit on the amount of material a Member State can utilize.

Moreover, recalling the Outer Space Treaty, there is not an international authority to govern such extraction or consumption, and since the main spacefaring nations have not ratified the Moon Agreement, there is no power or way to enforce that a State shares the resource it collects or that it restrains to abuse in the amount of resources it collects. Therefore, if the exploitation of resources in outer space was to go unchecked, we could be risking that they become scarce and causing irreversible environmental damages. In the past, different natural disasters regarding the utilization of natural resources on Earth have been further prevented from a resource rationing philosophy which has not been yet implemented in the Outer Space Treaty nor in the Moon Agreement.[89] Such methodology could be applied for the space resources utilization, so the problems already occurred though the commercial activities performed on Earth could be avoided in outer space.

Article 11

The '*common heritage of mankind*' is addressed closely by Article 11 (1) of the Moon Agreement when stating that the Moon, its natural resources and other celestial bodies within the solar system are the common heritage of mankind. Further, Article 11 (4) introduces the economic component of commercial activities in outer space by establishing that the use of the Moon and other celestial bodies shall be without discrimination of any kind on the basis of equality and in accordance with international law. Then Article 11 (5) recognizes and mandates the creation of an international regime, including appropriate procedures, that governs the exploitation of space natural resources when such exploitation was to become feasible. Even when it seems that the Article sticks to the tradition *common heritage* approach, it goes further providing a guideline for a future and concrete international regime for the exploitation of natural resources. Certainly, Article 11 (7) of the Moon Agreement sets four main elements to be included in the future economic order in the utilization of space natural resources:

i. Natural space resources shall be orderly and safe developed.
ii. Natural space resources shall be rationally managed.
iii. The expansion of opportunities in the use of those resources.
iv. An equitable sharing by all States Parties in the benefits derived from those resources, whereby the interests and needs of the developing countries, as well as the efforts of those countries which have contributed either directly or indirectly to the expansion of Moon, shall be given special consideration.[90]

[89] Rajala, R. Clearcutting the Pacific Rain Forest: Production, Science, and Regulation, (Vancouver, British Columbia: UBS Press, 1998), at 169; Douglas, R. The Dust Bowl: an agricultural and social history, (Chicago: Nelson-Hall Inc. Publishers, 1981), 2.

[90] *See* Article 11 (7) UNGA Res. 34/68, Agreement Governing the Activities of states on the Moon and Other Celestial Bodies, 5 December 1979.

The first two elements regulate and anticipate the importance of an orderly utilization of natural resources which avoids resource wasting activities. As stated before, these elements reflect the shortcomings of the commercialization of resources on Earth in the past, and thus implement precautionary measures in the use of space natural resources, especially in the case of scarce resources, in which it is explicit forbidden any one-sided management of their utilization.

The third element could serve for encouraging States to adapt their technologies for utilizing these resources. However, according to Hobe, this would cause States to refrain from prematurely utilizing resources until they set where the waste should stay.[91]

Finally, the fourth element arouses controversy as it calls upon Member States for an equitable sharing in the benefits of space natural resources. It is clear that all the Member States interests shall be considered, and especially those countries which have made major contributions to the exploration of outer space shall be honored by this Article. Hence, the equitable sharing referred to in Article 11 should not be understood as the solely benefit of developing States. On the contrary, such provision seeks a balance for the return of the benefit between those States who invest and the non-contributing countries. The debate surrounding this Article is natural since it remarks an asymmetrical benefitting of the developing States in which, giving especial consideration to their interests, they get some return even when they have very little or nothing invested.[92] This kind of retribution is equivalent to the '*common but differentiated development*'[93] philosophy which, reinforced by the intergenerational equity addressed before, ensure that the legitimate right of developing countries is not sacrificed in name of future generations.

When the '*common heritage of mankind*' concept was first addressed in the Moon Agreement two radically opposed views arose. On the one hand, the developing countries considered that the Moon and other celestial bodies should be understood as the common heritage of mankind since "*the benefits obtained from the use of the natural resources of the Moon and other celestial bodies shall be made available to all peoples without discrimination of any kind*".[94] On the other hand, developed countries suggested that such resources were *res nullius*, that is, assets that have no owner and, thus, are subject to appropriation.[95] As reflected on the agreed text, it was decided not to regulate the way in which the exploitation of resources has to be conducted, but the door was left opened so that when such exploitation would be possible, the regime were to be created. However, the Article providing the creation of a future regime lends to several interpretations as well, regarding for instance the lack of certainty as to whether the non-appropriation principle applies to the natural resources that have been extracted or about the procedure that must be followed for the exploitation of said resources, or how the equitable participation of all States will be given when extracting natural resources from space.

In conclusion, the '*common heritage of mankind*' debate in the utilization of resources in space is still ongoing due to different interpretations. Faced with the imminent possibility to exploit these resources in a commercial manner, developed States may not be keen in creating an international authority that governs their mining activities since this would represent the materialization of Article 11(7). That is, all their findings would need to be reported and the benefits arousing from them would need to be shared with all, without certainty of being able to make profits out of them. Surprisingly, or

[91] Stephan, H. *Supra* note 86, at 378.

[92] Ibid, at 379

[93] Stone, J. Common but differentiated responsibilities in international law, AJIL 98 (2004), at 276

[94] Art. IV, Argentine Draft Agreement.

[95] Gangale, T. The Development of Outer Space: Sovereignty and Property Rights in International Space Law. Estados Unidos, Santa Bárbara: Praeger (2009)

not, the referred vagueness of the Moon Agreement caused a significant uncertainty also amongst the developing countries, not giving them concrete reasons or incentives to ratify the Agreement.[96]

2.1.3. Conclusion

The *'common heritage of mankind'* term found in Article 11 of the Moon Agreement as opposed to the 'province of mankind' one found in Article I of the Outer Space Treaty, is one of the main reasons States, like Russia or the United States, refrained from ratifying the former.[97] Certainly, whereas the *common heritage* expression entails benefit sharing of the natural resource found on the Moon and other celestial bodies to all States, regardless of their direct or indirect efforts, the *province of all mankind* term allows Member States to freely explore and use outer space without obliging them to share the benefits derived from the activities in space. The crucial concept of the *common heritage of mankind* thus legally defined lies in the role of equity. As shown in Section 2.1.2., the Moon Agreement addresses both terms which convey that while the exploration and use of space natural resources fall under the *province of all mankind* concept (Article 11), the exploitation of those resources falls under the common heritage of mankind concept.[98] Ratifying the Agreement supposes that States would be only able to undertake commercial activities provided that an international regime would ensure that all States, especially the developing ones, benefit from those activities.

At this point of the analysis it is clear that the international community is in need of a legal regime that regulates the relevant aspects of the extraction of natural resources in outer space, as the feasibility of such exploitation arrived. However, the problem of such regime is that none of the spacefaring States will be bound to its provisions, jeopardizing its effectiveness in managing the extraction, utilization and consumption of resources in outer space. Some believe that even when a moratorium clause exists in the Moon Agreement, those resources were vested in mankind and the creation of an international regime will not oblige the owners to give them up.[99] Opposing that view are those who argue that, and as stated during the preceding negotiations, the Moon Agreement "*places no moratorium upon the exploitation of the natural resources on celestial bodies, pending the establishment of an international regime*".[100] Further, since the agreement have not been ratified for the spacefaring nations, exploitation of the extracted resources is likely to occur prior to the establishment of the said regime.

Nonetheless, in considering a future international regime, together with the spacefaring nations interests, the developing countries views in refraining to ratify the Moon Agreement should be also considered. Certainly, both the large majority of industrialized countries and the large majority of developing ones, refrained from ratifying the Agreement. Even when their decision was partly due to their demanding interpretation of the 'equitable sharing' expression as an *equal* distribution of benefits derived from space activities by all States, the lack of clarity should have not sufficed to not ratify the Agreement as its provisions were clearly in favor of developing nations.

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[96] Tronchetti, F. *Supra* note 51, at 58.

[97] Tronchetti, F. *Supra* note 51, at 59.

[98] Von der Dunk, F. *Supra* note 87, at 103.

[99] Virgiliu, P. Who owns the Moon? Extraterrestrial Aspects of Land and Mineral Resources Ownership, (2008) at 151

[100] Hearings on the Agreement Governing the Activities of States on the Moon and Other Celestial Bodies, Before the Subcomm. on Science, Technology and Space, 96th Cong., 2d Sess. 37 (1980), at 12 (statement of Roberts B. Owen)

The key element of Article 11 was that it was widely ratified, including spacefaring nations, so that the international regime was designed to serve the interests of all countries, regardless of whose exploitation it would concern.[101] Nonetheless, with the low number of ratifications this Article loses its aim and the establishment of the regime may be considered to be done outside of the Moon Agreement. In doing so, the ocean, the Antarctica and the GSO examples will be addressed in the following Section to provide guidance of provisions on non-sovereign areas that ensure cooperation among States in the equitably sharing of benefits in those regions.

2.2. The Hague Space Resources Governance Working Group Initiative for Developing Countries

The Hague Space Resources Governance Working Group (HSRGWG) was established to assess the needs and prepare the basis for a regulatory framework for space resource activities.[102] The Working group consists of approximately 25 members and a number of observes and is supported by the Dutch Ministry of Economic Affairs and the Ministry of Foreign Affairs.[103] So far it has held four face-to-face meetings in which 19 'Draft Building Blocks' (DBD) were identified as the main topics areas a future regulatory framework could include.

Building-block 4 suggests, among other things, that the international framework should be designed as to promote the rational, efficient and economic use of space resources, and taking into particular account the needs of developing countries.[104] At first sight, there is no reference at all to equity in the use of such resources. However, building-block 12 maintains the especial consideration given to developing countries, and recognizes that the benefit-sharing from the utilization space resources must be achieved through the promotion of the especial participation of less developed States in space resource activities.[105] In doing so, it maintains many of the elements addressed in the legal framework studied in Chapter 1. The final report reasserts the voluntary basis in which cooperation must be conducted, and proposes different mechanisms to achieve it without imposing a compulsory monetary benefit-sharing.

The final report seems to designate the authorization of space resource activities entirely to States and Intergovernmental Organizations, meaning that the international body set forth in building-block 17 would not be granted enforcement powers and would be rather in charge of monitoring the implementation of the international framework and more administrative tasks. This conception is opposed to the regimes analyzed in the following sections, and even brings up the question on whether these actors would be able to comply with their international space obligations? Accordingly, it is doubtful that States lacking the proper skills, procedures and personnel would be allowed to authorize space activities.[106] Further, a regime in which the interests and the real needs of developing countries are granted, requires an international authority guarantying that developed States do not abuse of their dominant position.

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[101] Von der Dunk, F. *Supra* note 87, at 110.

[102] Para 243. Report of the Legal Subcommittee on its fifty-seventh session, held in Vienna from 9 to 20 April 2018. UN DOC. A/AC.1057/1177

[103] The Hague Space Resources Governance Working Group. UN DOC. 1/AC.105/C.2/2018/CRP.18 12 April 2018, at 2.

[104] The Hague Space Resources Governance Working Group. Final Report. Leiden,18 December 2017. Reference number: HSRGWG/FR/1/15122017.

[105] Ibid.

[106] Lyall, F. 'Small States, Entrepreneurial States and Space' (2006) 49 *Proc. IISL* 382–90.

However, and opposed to the views that believe that the progress made by the HSRGWG may create confusion and interfere with the work of the COPUOS,[107] it has truly achieved a transparent and active role in the production of building blocks that could serve as a starting point for the future discussions of and international framework that regulates the utilization of space resources. Even when the aim of this work gives especial consideration to the needs of developing States, for which perhaps a more inclusive discussion could be addressed in upcoming meetings of the Working Group,[108] this itself would only happen under the grounds of the adaptive governance principle in which the DBB are founded.[109] Certainly, even when they address most of the relevant topics regarding space mining, the DBB are more a basis in which the very first problems are set, in order to address them eventually as they start to come out. Accordingly, the fact that the interests of developing States were considered in several BB, reflects the need to come to give that topic proper attention.

2.3. Convention on the Law of the Sea

Oceans have been for long time proclaimed to be free to all countries, excluding the area along a nation's coastline. Technological developments encouraged States to move from utilizing the resource of the seas close to their coastline, to pursuit of resource exploration into the deep sea.[110] Once the value of worth on sea resources was set, States began to discover how to exploit and commercialize the available resources, which led to the creation of the 1982 United Nations Convention on the Law of the Sea[111] (hereinafter UNCLOS), as a mechanism addressing issues related to the resources in the sea, its non-sovereign nature and the protection of the environment.[112]

In several international instruments, especially those contemporary with the Moon Agreement, there is an express reference to the equity principle. That is the case of the UNCLOS which in its preamble refers to "*the equitable and efficient utilization"* of resources of the seas and oceans, for "*the realization of a just and equitable international economic order which takes into account the interests and needs of mankind as a whole and, in particular, the special interests and needs of developing countries, whether coastal or land-locked*". Articles 74 and 83 provide an "*equitable solution*" for the delimitation of the exclusive economic zone between opposite and adjacent States, and the continental shelf on the basis of Article 38 of the ICJ Statute, as discussed in Chapter 1.

According to Article 82 the income from payments made regarding the exploitation of the continental margin beyond the 200-mile zone, is to be distributed "*on the equitable sharing criteria*". Similarly, the perhaps most controversial and relevant provisions for the purpose of this work lay within Part IX[113] of the UNCLOS, envisaging that the profits to be derived from activities in the deep seabed lying beyond areas of national jurisdictions are to be distributed on the basis of equitable sharing. The

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[107] *Supra* note 103.

[108] ANNEX I – Participants of The Hague Space Resources Governance Working Group. Even when a considerable number of delegations are involved, developed countries represent by far the majority.

[109] The HSRGWG. *Supra* note 104, Building-block 4

[110] Christie, D. & Hildreth, R. Coastal and Ocean Management Law, 2nd Edition. St. Paul, MN: West Group (1999)

[111] United Nations Convention on the Law of the Sea (done 10 December, 1982, entered into force November 16, 1994), Vol. 1833 UNTS 396, I-31363 (UNCLOS)

[112] The United Nations Convention on the Law of the Sea (A historical perspective). Prepared by the Division for Ocean Affairs and the Law of the Sea, Office of Legal Affairs, United Nations. United Nations - Office of Legal Affairs (2012). Retrieved from: http://www.un.org/depts/los/convention_agreements/convention_historical_perspective.htm (Last visited 25 July, 2018)

[113] Ibid, Articles 140, 155, 160, 162, 173.

discussion surrounding these provisions were one of the reasons for which the UNCLOS took twelve years to enter into force, due the impossibility for developed and developing States to reach an agreement on how to understand the benefit sharing of exploited resources.[114]

Certainly, Article 136 uses a similar terminology addressed in the Moon Agreement, declaring the Area[115] and its resources to be the *common heritage of mankind*. According to Article 140 the International Seabed Authority set forth by the UNCLOS is responsible for ensuring "*equitable sharing of financial and other economic benefits derived from activities*" within a given area. Under Article 144, the same Authority shall promote and encourage the transfer of technology and scientific knowledge obtained from their activities within an area, to benefit all States Parties. However, in reality it is more likely that developed States precede the exploration activities which lead to the development of new technologies, rather than if a developing State assumes such task without the needed resources or the financial ability to invest in technological improvements. Even when in principle the agreed text seemed to favor the developing States, developed countries were in the position to address a more liberal approach regarding the introduction of the *common heritage of mankind* principle which reduced considerably the mandatory obligation imposed on developed States, thus achieving no mandatory transfer of technology.[116] Although often a developed State is not willing to transfer an advanced technology to any State, the latter was a needed action considering that the industrialized countries are supposedly the ones that contribute in helping the developing ones.

The agreed text in respect of the management of the Area was not free from discussion, especially when under Article 137 the International Seabed Authority was empowered to license and control the access to the seabed mining zones and the recovery of minerals from them. Moreover, such licensing would only proceed if conditions were set in order to allow other States, mainly the developing ones, to benefiting from the profits of any authorized activity.[117]

Developed countries delegations were highly opposed to the Draft Convention.[118] That was the case of the United States who ultimately refrained from signing the Convention of the UNCLOS considering the proposed legal regime to be detrimental to its political and economic interests and an obstacle to the development of seabed resources.[119] The uncertainty in respect of their interests and the lack of protection given by the Draft Convention for countries already exploiting and investing in seabed mining prior to 1982, made the U.S Congress to enact the Deep Seabed Hard Mineral Resource Act on June 28, 1980. Just as the Unites States did for the exploitation of resources in outer space by issuing the Commercial Space Launch Competitiveness Act[120], the Deep Seabed Hard Mineral Resource Act promotes the exploitation of sea resources and establishes a licensing system for those nationals wishing to participate in exploitation activities.

This approach represents a great example of a legal regime attempting to regulate the exploitation of resources in a non-sovereign area, and in which major States players refuses to sign it.

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[114] Tronchetti, F. *Supra* note 51 at 104

[115] Article 1. United Nations Convention on the Law of the Sea. *Supra* note 112. Area: The seabed and ocean floor and subsoil thereof, beyond the limits of national jurisdiction.

[116] Hobe, S. *Supra* note 27 at 391. The application of the *common heritage of mankind* principle was substantially changed and more flexible politic and economic requirements were introduced by the 1994 Implementation Agreement.

[117] Von der Dunk, F. *Supra* note 87 at 99.

[118] See *Official Records of the Third United Nations Conference on the Law of the Sea*, Vol. XVI (United Nations Publication, Sales No. E.84.V.2), Summary records of meeting, Plenary meetings, 157th meeting, para. 19.

[119] Tronchetti, F. *Supra* note 51, at 106-107.

[120] U.S. Commercial Space Launch Competitiveness Act, Adopted 14 Nov. 2015, as Public Law No: 114-90

The same scenario could be transposable in outer space exploitation, however, the Law of the Sea regime also represents the risk of a wrong balance of interests due to the influence of the *common heritage of mankind* principle. The idea of an equal share of resources and technology aroused the debate in both the UNCLOS and the Moon Agreement since it has never been an attractive way to promote innovation. Accordingly, the lack of economic incentives for private investors and the disparity of power between developed States holding the necessary technology and the risk capital, and developing States wanting to share the economic and technological benefits and controlled vote in the International Seabed Authority, represent the major shortcomings of Part IX of the UNCLOS.[121] Following the contemporary development of the *common heritage of mankind* principle in the outer space and in the maritime legislation, it is to affirm that it led to the widespread abstention of the industrialized developed countries from ratifying the Moon Agreement.

Consequently, the provisions lay down in the Outer Space Treaty regarding that activities must be conducted for the '*benefit and (…) interest of all countries*' end up being more convenient for those refusing to ratify the Moon Agreement because as long as they conduct their activities without significantly harming another State, they will be allowed the freedom to use and explore outer space. Indeed, under Article II of the Outer Space Treaty, outer space is a defined area where, just as on the high seas, freedom rules. Hence, only the community of States can legally establish a binding regime regulating activities in this area, but until such regime is not in place, the freedom governing outer space activities remains.

Although countries such the United States and Luxembourg already enacted national Space Acts as a legal basis needed to secure investments, they recognize that as parties to the Outer Space Treaty they are subject to its provisions and even call upon a reinforced and effective collaboration with other States for a subsequent future international arrange.[122] Moreover, even when such exploitation is better to be conducted under a national legal regime, rather than under other unregulated systems, States should join efforts in the creation of an international regime as to the imminent exploitation of resources in outer space is already happening.

The UNCLOS regime and its subsequent amendments shown how the common heritage of mankind approach had to be reshaped in order to adapt the system with political and economic realities, thus making it more readily acceptable by all States. However, the 1982 Convention may not be the most appropriate one to replicate for the exploitation of space resources and to grant real cooperation among States and in turn achieve a greater equitable benefit sharing. Instead, instruments such the 1994 Implementation Agreement[123] of Part IX of the Law of the Sea Convention could serve as an example of a way of amending the Moon Agreement provisions in which States may give another approach to the controversial elements addressed therein.

2.4. The Geostationary Satellite Orbit as a 'limited natural resource': The case of the International Telecommunication Union.

2.4.1. The Role of the ITU in Space Cooperation.

[121] Tronchetti, F. *Supra* note 51, at 108

[122] *See* Luxembourg Explanatory Statement. Draft Law on the exploration and use of space resources. (English Translation) (2016).

[123] Agreement relating to the Implementation of Part IX of the United Nations Convention on the Law of the Sea of 10 December 1982 (done 28 July, 1994, entered into force provisionally 16 November 1994, entered into force definitively 28 July 1996) 1836 UNTS 3

The ITU is a specialized agency within the UN system in charge of regulating the use of the radio spectrum, setting international equipment and other standards for telecommunications, and with a focal role in the utilization of the GSO.[124] The ITU's legal regime, codified through the ITU Constitution and Convention,[125] and the Radio Regulation,[126] address the main principles and regulations based in the main principles of efficient use and equitable access to the spectrum/orbit resources laid down in No. 196 of the ITU Constitution.[127]

Together with the ITU, COPUOS exerts similar functions which suppose that the competence of both institutions tend to overlap in some scenarios, meaning the relationship among them has not escape from conflicts. However, the General Assembly have recognized that the ITU is a major role player making it another regulator of space activities.[128] Moreover, Doc. A/AC.105/327 COPUOS respects the mandate given by the agreement between the UN and the ITU, and observes as well a regulatory hierarchy attached to the issued instruments of the Union by the issuance of regulations and recommendations.[129] In doing so, the ITU system makes easier activities allowed and regulated by Space Law. The ITU regime is produced through an international organization, with a similar status as the UN itself, but which, unlike the UN, is competent to create rules and control their compliance. Scholars and delegations within COPUOS have addressed the need of a closer cooperation between both organizations,[130] which may be why the relationship among them have been rather effective in avoiding undue divergences or incompatibilities within telecommunications law and space law.[131]

Although the connection of the ITU with international space cooperation may not be obvious, the Union has played a major role in modern cooperative space activities. Space activities could not be such a thing without the involvement of telecommunication as the all need interference-free access of radio frequencies.[132] Within the ITU, the interests of developing countries have also to be considered and met. One of the milestones set by the phrase '*benefit and interest of all mankind'* has been the transformation of the Union from having a merely technical functions to include in its scope the fostering of telecommunications of developing countries.

2.4.2. Allocation Mechanism of the Orbit Spectrum Resource (OSR)

Insofar as there is no sovereignty in outer space, no property rights are granted and only the use of outer space and its resources is allowed for a limited time and on a fair and just sharing system, meaning orbital positions and radio frequencies are freely to be used under Article I of the Outer Space

[124] Viikari, L., The Environmental Element in Space Law: Assessing the present and Charting the Future (2008), at 85

[125] Constitution of the International Telecommunications Union, 22 December 1992, 1825 UNTS 331, [1994] ATS 28, [1996] BTS 24 (entered into force 1 July 1994)

[126] Ibid, Article 31. The Radio Regulations are binding international instruments with Treaty status.

[127] Ibid, Article 44.

[128] UNGA Resolution 1721 (XVI). *Supra* note 18; Tronchetti, F. *Supra* note 63 at 492-93.

[129] Van Traa-Engelman, H. Commercial utilization of outer space, at 102 (1993)

[130] *See* COPUOS/LEGAL/T.773, 2008; Benkö, M and Schrogl, K. Essential air and space law 2: current problems and perspectives for future regulation (2005) at 50

[131] Von der Dunk, F. *Supra* note 63 at 493

[132] Von der Dunk, F. *A New 'Star' in the Firmament – Teaching Space and Telecoms Law as a Post-Graduate LL.M. Programme,* Korean J. of Air & Space L. (June 2011), at 419-20.

Treaty. Since the GSO and the frequency bands for radio services are limited natural resources, the ITU must guarantee its rational, equitable, efficient and economical use.[133]

The a posteriori or Coordination Procedure for Unplanned Services

In order to be awarded a GSO slot, emphasis was made from the outset on rational, efficient and cos-effective utilization, implementing a '*first come, first served'* procedure to ensure interference-free operation. In theory, this procedure entails a clear cooperation component, as it purports that the right to use the OSR is acquired through negotiation with the concerned administrations aiming to use the same portion of orbital segment.[134] However, allegations of harmful interference with neighboring satellite systems and accusations of lack of cooperation in the coordination of the use of frequencies, reflect that the management of the OSR is becoming increasingly challenging and in great need of practical solutions.[135] However, law of physics obliges parties to coordinate because one State cannot cause interfere to another State without it itself suffering interference.

The 'assignment' of a frequency to a particular radio station is the sovereign prerogative of the State having jurisdiction over the operator of the station.[136] In broad summary, if certain frequency band is called upon this procedure, the National Regulatory Agency (NRA) of the concerned State notifies the ITU Bureau of the OSR needed to satisfy their actual requirements.[137] This information is published so that other States can determine if their systems could be affected, and if so the notification would be returned for corrections. If the finding is favorable the coordination request starts with consultation with the affected State(s) to coordinate assignments. Once an agreement is reached, administrations communicate it to the ITU Bureau which records it into the Master International Frequency Register (MIFR), which gives international recognition and protection of a State's satellite system.[138]

The positive outcomes of this procedure is that, when applied to genuine needs, efficient spectrum/orbit management is achieved. Although, this procedure has shown to be effective regarding the allocation of the OSR, the coordination procedure hardly guaranties the equity and rational use of the GSO, since it still works under the '*first come, first served*' system, a long and complex process, which represents an obstacle and a disadvantage for developing countries[139]. Moreover, there is no a strong regulation that refrain States from filing for slots 'just in case', resulting in a waste of manpower and other valuable resources[140]. Finally, States with a real system ready to notify, find themselves in the duty to coordinate their system with the so-called 'paper satellites'.[141] Nevertheless, an 'administrative

[133] Article 44, Constitution of the International Telecommunications Union. *Supra* note 125. Article 33 of the 1982 Convention was transposed into Article 44 of the 199 ITU Constitution.

[134] Lyall, F. *Paralysis by phantom: problems of the ITU filling procedures*, in Proceedings of the Thirty-Ninth Colloquium on the Law of Outer Space (1996), at 189

[135] Buzdugan, M. Proceedings of the International Institute of Space Law of 2010, AIAA, Washington D.C., USA (2011) at 327.

[136] No. 1.18 of Article 1. Radio Regulations, signed in Geneva on December 6, 1979, as revised by the World Radiocommunication Conference of 2016 at Geneva. From 1 January, 2017 non API procedure is longer required for satellite networks subject to coordination.

[137] Ibid, Article 9.

[138] Ibid, No. 8.3 of Article 8.

[139] Radiocommunication Advisory Group (2003). Review to the Resolution 80 (Doc. RAG03-1/5-S), at 3.

[140] Von der Dunk, F. S*upra* note 67, at 483

[141] Tronchetti, F. *Supra* note 51, at 183

due diligence' has been introduced, in order to filter out those proposals that demonstrate the serious will to use an assignment.[142]

The a priori or Planning Procedure

The *a priori* plans were result of the saturation problems of the GSO due to its progressive exploitation, and the need of guarantying equitable access to the OSR for future use by all countries. The allocation of these assignments shall not be confused at all with sovereignty privileges, on the contrary, it is the right of use which is being vested, meaning they resemble a right of coordination priority[143]. The planned bands empower States to freely use the predetermined assignments that has been reserved to it, which normally covers only the country's territory, encouraging developing countries to make use of this resource, thus, promoting space development and a better provision of orbit services.

Even when some consider the planned allotments a breakthrough for developing countries, as the GSO is reaching its limit capacity and the coordination procedures are too difficult and detailed,[144] others believe these allocations are insufficient and obsolete, and do not represent a genius materialization of equity, but instead a fake protection to less developed countries. States are not required to demonstrate a real need or technical capability to use an assignment. This has raised many critics, since some developing States with no interest on pursuing the space race, block in this way their assigned slots.[145] However, the aforementioned practices have not been sanctioned nor forbidden by the ITU, and in any case the efficient and economic use of the GSO is also being assured somehow.

2.4.3. Conclusion

In conclusion, as the OSR, and more precisely the GSO, and the frequency spectrum are *res communis* and no State have sovereign rights over them, international cooperation is necessary and international organizations like the ITU have a major regulatory role in order to guarantee the efficient and equitable use of the OSR. On the other hand, regarding the *a priori* plans the goal of equitable access to the GSO should not be accomplished just by ensuring an orbital position to each State, but also by an active role of the ITU in following the State's interest on utilizing it. Nonetheless, the ITU preserves its leading role as it has a satisfactory institutional structure to keep the pace of the changing area of outer space. As such, it has been suggested that the nature of the ITU, as an international organization, is the most appropriate form of cooperation for achieving the Union goals set forth in Article 1 of its Convention – harmonization of the member-States' activities and promotion of "*fruitful and constructive cooperation and partnership between Member States and Sector Members' in the improvement and rational use of telecommunications of all kinds*".[146] Certainly, in aiming a worldwide regulatory scope of its activities, requires a universal participation of [almost] all States. Further, international telecommunications are only possible when they are properly coordinated and uniformly

[142] Resolution 49, *Final Acts, World Radiocommunication Conference (Geneva, 1997)* (WRC-97 as amended by WRC-03 and WRC-07)

[143] Lawrence D. Roberts, A Lost Connection: Geostationary Satellite Networks and the International Telecommunication Union. Berk. Tech, (2000), at. 1128.

[144] ITU. The Regional Radiocommunication Conference begins: Development of a plan for digital terrestrial broadcasting (2004)

[145] Morozova, E. *Leasing of Orbital Positions.* In Hofmann, M. and Loukakis, Andreas, Ownership of Satellites. 4th Luxembourg Workshop on Space and Satellite Communication Law. (2017) at, 199.

[146] Voronina, A. *Supra* note 17, at 203.

regulates, thus the ITU's mandate requires a harmonized set of international regulations that supersedes national regulations addressing the same subjects.

The latter does not mean that successful international cooperation can be reached just by means of an international organization. If such a mechanism would not exist, still the law of physics would have promoted cooperation among the concerned States in order to avoid causing interference between them. This, however, would bring up the question of whether the involvement of developing countries would have been the same, and if the consideration of equitable access to the OSR would have been considered, especially regarding their successful accomplishment during the 1985 and 1988 WARCs in including *equity* as one of the principles governing the use of the GSO. Therefore, in this instance, developing countries interests and needs would have been hardly considered without the existence of such an organization like the ITU.

2.5. Assessing the two regimes

The low number of ratifications of the Moon Agreement leaves the door open to those who argue in favor of a specific regime governing the exploitation of resources in outer space. However, the debate remains in whether the unenforceable existent regime should be complemented by a set of balanced and fair rules through a re-interpretation of or an amendment to the Moon Agreement, or by replacing it with an alternative binding instrument more suitable to achieve broader consensus amongst States.[147]

Examples such as the US and Luxembourg Space Acts represent the risks posed by a legal lagoon regarding the exploration and extraction of natural resources in outer space, but even when they are attempts for a possible interpretation of Treaty Law, they do not embody necessarily the only correct interpretations. Moreover, it also reflects that the feasibility of the exploitation of such resources, as enshrined in Article 11 of the Moon Agreement, has arrived and therefore the creation of an international special regime is apparent. However, although national legislation is just present in a handful of States and may only deal with issues that have not been addressed at the international level,[148] the Outer Space Treaty is the one to ensure that outer space is *"free for exploration and use by all States without discrimination of any kind*". One of the main purposes of public international law is reaching a legal order that prevents States from entering into conflicts over any type of resources whether on Earth or beyond.[149] Thus, concluding an international regime relating to space resources rights would certainly benefit all stakeholders.

It is clear that in one an another instrument the notion of *common heritage of mankind* has different features. However, its general characteristics remain: the elements of non-appropriation, the demilitarization, the call for scientific investigation and, although still controversial, the economic one, are always present. With respect to this last element, a more liberal amended Part IX of the UNCLOS left behind the restrictive approach adopted in 1982, and therefore, technology transfer is no longer mandatory, States are not obliged to explore two fields for being allowed to explore one of them, and in

[147] Hobe, S. *Supra* note 116, at 107.

[148] Von der Dunk, F. "Another Addition to National Space Legislation: The Austrian Outer Space Act, Adopted 6 December 2011," in International Institute of Space Law, *Proceedings of the International Institute of Space Law* (2012), at 643-44. Different terminology which was not defined by the Treaties has been given a definition in national space acts.

[149] Masson-Zwaan, T. & Palkovitz, N. Regulation of space resource rights: Meeting the needs of States and private parties, *Questions of International Law* 35: 5-18 (2017)

general other initial obligations of developed states were reconsidered.[150] On the other hand, the Moon Agreement is by no means a too rigid or too radical regime, on the contrary, it is rather a well-balanced regime with an answer to the fact that freedom cannot exist without limits.

The UNCLOS model encompasses very detailed operational rules and establishes new decision making, monitoring and resolution of disputes structures.[151] Even when this approach could be transposed to space, it would require a massive, highly complex, and detailed negotiation for reaching another kind of constitution for space. Naturally, this would require major political cooperation and commitment on the part of the spacefaring nations as to avoid the 1982 mistakes, however, such commitment has not been shown so far. Accordingly, a better elaborated regime for the utilization of space resources will require leaving behind the analogy of the 'freedom of the seas' and the idea of security based on deterrence, to a new framework based on principles of equal protection in outer space, equitable access to space resources and where cooperation among nations and over administrative bodies is recognized as strongly necessary.

Alternatively, the ITU model provides a common denominator in the sense that both the GSO and the resources in outer space are 'limited natural resources', which may be managed and allocated as to prevent their wasteful use and to maximize their value.[152] The Legal Subcommittee recognized that the 'first come, first served' principle governing non-planned bands was not capable of satisfying fully the needs of developing countries, representing a disadvantage for those yet to have access to that orbit. Therefore, it was necessary "*to ensure equitable access between those countries already having access to the OSR and those seeking it*". The document recommended that In the case of comparable requests for access to the OSR by i) a country already having access to it and one that has not had it yet, or ii) by a developed country and a developing one, the coordination procedure should be avoided, thus enabling the developing country or the country that have not accessed yet to have equitable access to the requested OSR.[153]

Despite their polemic practical applicability, the concepts of equitable access and efficiency should be introduced in the new legal regime in order to strike balance between the needs and interests of developed and developing countries. In assessing whether to implement the procedures for the allocation of OSR, the *a priori* system represents the first success regarding the equitable access to the GSO. However, as it will be addressed in Chapter 3, neither of the two models can be effectively transposed without breaching the Outer Space Treaty.

[150] Hobe, S. *Supra* note 116 at 376

[151] Tannenwald, N. Law Versus Power on the High Frontier: The Case for a Rule-Based Regime for Outer Space. The Yale Journal of International Law. Vol. 29 (2004) at 420.

[152] Tronchetti, F. Supranote 51 at 187-188.

[153] Doc. A/AC.105/738, annex III

CHAPTER 3.

RECOMMENDATIONS: APPLICATION OF INTERNATIONAL COOPERATION IN ACHIEVING EQUITY IN THE EXPLOITATION OF OUTER SPACE

International Law has a progressive development, which means that it is evolving day by day in order to achieve a good balance between stability and change,[154] thus it cannot be static since this would constitute an obstacle to the development and evolution of society. Certainly, the continuous expansion in the range of space activities together and the increasing number of the space actors, justify the progressive development of new international rules governing activities in outer space.[155]

Article 15 of the Statute of the International Law Commission (hereinafter the Commission) defines 'progressive development of international law' as "*the preparation of draft conventions on subjects which have not yet been regulated by international law or in regard to which the law has not yet been sufficiently developed in the practice of States*". The Commission is aware that in order to achieve a progressive development of international law, its application and effectiveness is possible by means of international cooperation[156].

3.1. Crucial elements towards a future international regime governing space natural resources

The need to regulate the issue of natural resources in space is imminent especially when the number of countries deciding to regulate the issue internally keeps increasing, due to the absence of an international regime. Otherwise, peace would not have been possible in outer space. As a global trend, the social needs tends to prevail over the individual ones, and in this case international matters will prevail as a need for complement and unity among peoples fighting the individualistic mistakes from the past.[157] The future international regime governing the extraction and utilization of resources responds to the commitments of the States in intervening in space activities as agents of the common good. Such responsibility is derived from Article VI of the Outer Space Treaty, which entails that States must refrain itself and prevent others from appropriating space resources.

This future international regime must be built over the fundamental principles set forth in the Outer Space Treaty for which this instrument, together with the doctrine elaborating it, the universal consensus supporting it and the decision of the signatory States, has acquired a constitutional law status. This necessarily supposes that the new regime will be in harmony with the non-appropriation of any area or resource in outer space by claims of sovereignty. As it has been addressed, countries are not in the same conditions to access those resources, which may end up in the monopoly of areas or resources from those States with the effective dominant power to appropriate them.[158] Considering the impact of massive and uncontrolled extraction of natural resources on Earth, the subsistence of the planet and the human beings is being threatened.[159] In this sense, the following proposal does not argue

[154] Discussions during the Dumbarton Oaks Conference for the creation of the International Law Commission (1945)

[155] A/48/305. Study on the application of confidence-building measures in outer space. Report by the Secretary-General. New York (1993).

[156] General Assembly Resolution 94 (I). Progressive Development of International Law and its Codification. Fifty-fifth plenary meeting, 11 December 1946.

[157] Ferrer, M. Space Law. Ed. Plus. Buenos Aires (1976), text originally in Spanish, at 23.

[158] Report of the Legal Subcommittee on its fifty-seventh session. *Supra* note 102, para. 241.

[159] United Nations Environment Program. Global Material Flows and Resource Productivity. Full Report (2016). UNESCO (2016) Retrieved from: http://wedocs.unep.org/bitstream/handle/20.500.11822/21557/global_material_flows_full_report_english.pdf?sequence=1&isAllowed=y (Last visited 05 August, 2018)

against exploration and utilization of natural resources, but against doing so without a binding legal instrument limiting its scope and which offers guarantees and security for all States.

The essential elements in the creation of a new international legal regime are listed below:

i. Consensus

Even when the efficiency of consensus has aroused many critics in the last years,[160] the negotiation and further decision process should be conducted within COPUOS rules. As Cocca asserted once, consensus is evolving as the instrument with the greatest effectiveness and impact in international cooperation and peace, granting decisions the same legal value as the voting procedure.[161] Consensus is a desirable way of achieving international agreement as it provides them with broad international acceptance, especially from the major spacefaring nations, which could identify with the compromise solutions found in the COPUOS.[162] Additionally, it is effective in promoting peaceful negotiations as States are never coerced in the decision making process and, instead, it incentivizes dialogue between cooperating States thus, increasing the likelihood of adoption of a decision that benefits all concerned parties and strengthening the possibilities so that the rule of law will be respected in good faith by the majority of the States. Therefore, it is proposed that whether the Moon Agreement is amended or reinterpreted, or a new Treaty is promoted, such new legal regime will be reached via consensus.

ii. International Responsibility of States

The purpose of addressing this element is to introduce the Exploiting State concept which finds its basis in Article I of the Liability Convention when it creates the Launching State notion, and in Article I of the Registration Convention regarding the State of Registry term.[163]

It is relevant to revisit how the ITU manages a limited natural resource as the GSO. Recalling the outcome of the 1973 Plenipotentiary Conference, it is proposed that natural resources in outer space, including the Moon and other celestial bodies, "must be used efficiently and economically so that States or groups of States may have equitable access to both (…) according to their needs".[164] Considering the scarcity of OSR, it is to affirm that the way in which the ITU addressed the concerns of developing countries and find the balance with the interests of develop States, has been effective.

Naturally if a term is proposed, a definition is expected. Considering the state of the art, the current stage of the technology and how far the man has gone in developing activities in outer space, a possible definition of this term is proposed below:

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[160] Benkö, M. and Schrogl, K-U. *International Space Law in the Making: Current Issues in the UN Committee on the Peaceful Uses of Outer Space* (1993), at 9.

[161] Cocca, AA. (1991). Progressive development of International Law [Text originally in Spanish]. Buenos Aires: Publicaciones de la Fundación Casa de la Cultura de Córdoba; Galloway, E. "Creating Space Law," in N. Jasentuliyana and R.S.K. Lee (eds.), *Manual on Space Law*, Vol. I (1979), at 248.

[162] Jankowitsch, P. "The Background and History of Space Law," in F. G. von der Dunk (ed.), *Handbook of Space Law* (2014), at 12.

[163] This concept was proposed to the author of this thesis by the expert on the subject and former delegate at COPUOS, Professor Alfredo Rey Córdoba.

[164] Article 33 of the Radio Regulations as agreed during the Plenipotentiary Conference of 1973.

A State which, either directly or indirectly, exploits or procures the exploitation of natural resources in outer space, including the Moon and other celestial bodies by governmental or non-governmental entities.

An Exploiting State shall ensure that such exploitation of natural resources is carried out for the benefit of all countries in accordance with the principle of international cooperation. Accordingly, space natural resources must be used efficiently and economically so that States or groups of States may have equitable access to both (…) according to their needs"

As such, this new concept would regulate the utilization and exploitation of natural resources and would serve to make Exploiting States responsible for national exploitation, whether such activity is carried on by governmental agencies or non-governmental entities. Further, States would be subjected to the authorization to exploit certain areas in outer space only if the international body, addressed in the last item of this Section, grants such permission.

iii. International Cooperation

With the fast development of space technology and its applications in the recent years, major changes are happening. Firstly, space activities have become more complex; secondly, the number of demand in this field keeps growing; and thirdly, the number of actors in space activities has become increasingly plural.[165] This context has brought States together in developing International Space Law while carrying out wider and further international cooperation in facing the new current challenges.

Certainly, cooperation is now an integral part of the Space Policy as it gives to all States and intergovernmental agencies the opportunity to rationalize and optimize their planning and resources by coordinating the development of their missions.[166] Ciccarelli suggests that space cooperation with developing countries requires three main actions:

i) capacity building, education and training;

ii) access to information and data sharing;

iii) technical assistance and technology transfer.[167]

Even though agencies such as NASA acknowledges that their cooperation guidelines may need modification, so far it is addressed that cooperation between emerging space nations must be protected against unwarranted technology transfer and, therefore, adopt a minimum technology transfer approach.[168] However, as more technical cooperation is required, the conditions influencing the amount of cooperation is centered on the collective good rationale notion. This concept encompasses a process in which a dominant space actor influences others on the basis of an asymmetric distribution of

[165] Minwen, L. *Supra* note 19 at 646.

[166] Correll, R. and Peter, N. Odyssey: Principles for enduring space exploration. Space Policy 21 (2005) at 251.

[167] Ciccarelli, S. Space Cooperation with Developing Countries: The Case of Morocco. Journal of Middle Eastern Geopolitics (2006). Retrieved from: http://ojs.uniroma1.it/index. php/JMEG/article/viewFile/3130/3114 (Last visited 08 August, 2018)

[168] Balsano, A. Technology Transfers and Public International Research Organizations: The Example of ESA, Proceedings of the 37th Colloquium on the Law of Outer Space (1994) 121–130.

resources and knowledge to adopt cooperative policies that are congruent with its preferences.[169] This correlates with principle XIII set forth in the Principles Relating to Remote Sensing on the Earth from Outer Space, which reflects how the activities conducted by one State should consider the interests of others and how it should facilitate other States partaking in the benefit growth.[170]

In Chapter 1 international cooperation was the leading principle of each of the different instruments addressed. Therefore, looking to enhance the negotiation of an international legal regime, international cooperation as encouraged in those instruments, could serve as to increase the benefits and facilitate State's partake in the exploitations of outer space resources. That is to say, those countries with the potential to access outer space for exploration and exploitation purposes, namely *Exploiting States,* should inform other States via the International Space Authority about their intensions, in order to determine if other States, regardless of their degree of development, would be interested in participating. It is important that, as discussed, such cooperation cannot be forced and thus, an eventual transfer of resources or technology should happen under a voluntary basis.

iv. Equity: softening the *common heritage of mankind* ideal.

Since space natural resources in general, including the GSO and the frequency spectrum do not belong to the national domain of States, its management is deemed necessary. As analyzed in Chapter 1, the provisions of the 1996 Declaration on Space Benefits offer interesting solutions for the establishing of a new legal framework. Together with the abovementioned cooperation element, it must be clear that in such future regime no mandatory transfer of technology and sharing of benefits derived from commercial activities in space exists. The evolution that the common heritage of mankind concept has suffered, represent the acceptance by the developing States of the need for softening some of the most rigid elements of this concept, such as those regarding the mandatory transfer of technology and benefits.[171]

One of the main features of equity as a principle is to inspire laws with the capacity to achieve a 'correct balance' between competing outlooks.[172] The role of equity in international law has been a constructive one as seen in the case of the UNCLOS and the ITU. Only the Moon Agreement addressed a formula for the sharing of space extractible resources, which pursuant to the previous instruments would have been assessed under the *res communis* principle. Whereas the latter is found on equality-based principles, the *common heritage of mankind* philosophy calls upon the share of benefits.

Equity's concern for fairness and justice would be hardly achieved if the supporters of this principle cannot enter into suitable accommodations and compromises with those with the potential to support the virtues of efficiency, namely the developed spacefaring nations. This is reflected on the outcome of the UNCLOS before its 1994 Amendment. A new interpretation of the *common heritage of mankind* is a crucial point in the discussion of a future regime, as it was the breaking point during the negotiation stage of the UNCLOS and the Moon Agreement. However, this does not mean that the concept has to be deleted, or supersede by the previous *province of mankind*, as suggested for Von der

[169] Aganaba-Jeanty, T. Common benefit from a perspective of "Non-traditional Partners": A proposed agenda to address the status quo in Global Space Governance. Institute of Air and Space Law, McGill University, Canada (2015) at 174.

[170] UNGA Resolution 41/65 (03 December 1986) 'Principles Relating to Remote Sensing of the Earth from Outer Space'.

[171] Tronchetti, F. *Supra* note 51 at 84.

[172] Williams, S. "The Role of Equity in the Law of Outer Space" *International Relations* (1975) at 782-783

Dunk.[173] On the contrary, even when with the 1994 Implementation Agreement of Part IX of the UNCLOS the developing countries lost too much of the initial agreement, a similar mechanism could give the chance to readdress the *common heritage of mankind* concept, as to ensure that the developing countries will benefit in different levels from the utilization of outer space and its resources, without giving up the term itself.

In consequence, in order to promote the regulated exploitation of natural space resources, there should be an economic incentive for those States performing the extraction and exploitation of such resources which should be assessed according to the degree of involvement of other States in that exploitation. This assessment supposes many edges, but the main purpose would be that for example an *Exploiting State* could commercialize those resources they can bring to Earth, generating enough profits to continue such activities and while carrying out such exploitation according to the especial needs of the different countries and their will to cooperate.

3.2. International Space Authority

In considering the role of an International Space Authority (ISA) the relevant points studied in Chapter 2 from the International Seabed Authority and the ITU will be addressed. Outer Space, including the Moon and other celestial bodies, are amongst the few places not governed by a legal authority. The relevance of this international body is that Member States would be subjected to an authority in charge of regulating the exploitation and extraction of resources according to the fundamental principles of Space Law, as it has been done so far by the ITU regarding the special features of the GSO. Moreover, as suggested by the HSRGWG on its building-block 17, the creation of such body would also allow greater control, making the most out of the eventual discoveries while keeping States informed of the progress achieved in the course of the space activities.[174]

According to Article IX of the Outer Space Treaty, if a conflict arises and cannot be solved, Member States are entitled to request international consultations. So far there is no case law in Space Law as no genuine international conflict has occurred.[175] However, with the development of space science and technology and the increasing cooperation among States, irrespective of their degree of development, the number of actors is growing and so does competitiveness and the risks entail to it.

The lack of space mining regulation is holding some private entities to start exploiting outer space and its resources, which would raise the question whether a legal binding instrument would be useful in setting up clear obligations. That certainly would strengthen the will to cooperate as the needs of developing countries will remain a cornerstone in this future regimes.

The ISA's method to allocate rights of use would be different to that of the Seabed Authority. Whereas the latter authorizes exploration and exploitation applications for a fixed fee and on a first-come, first-served basis,[176] the ISA could grant licenses if this *Exploiting State* manages to include cooperation agreements in the developing of those activities that sustain the benefit of all countries. The payment made by the bidder would fund the ISA's mining-related activities such as recording of such

[173] Tronchetti, F. *Supra* note 51, at 122.

[174] Building-block 17. *Supra* note 104.

[175] Most of the potential conflicts have been due to the fall of space debris, however, these cases have been solved through directly negotiation among the concerned States.

[176] International Seabed Authority, Regulations on Prospecting and Exploration for Polymetallic Nodules in the Area (13 July 2000) 2, 12-13; Oxman, B., 'Law of the Sea Forum: The 1994 Agreement on Implementation of the Seabed Provisions of the Convention on the Law of the Sea'. American Journal of International Law (1994) 687, 692.

licenses, adjudicating disputes, the maintenance of a publicly available international registry for priority rights to search and recover space resources, etc.[177]

Ideally the ISA would have more limited functions than the Seabed Authority considering that the latter is in direct competition with licensees as it is entitled to mine resources in the reserved area.[178] In contrast, the proposed ISA would refrain from being both a mining competitor and the resource regulatory authority, and instead its role would be to facilitate mining by examining States applications.

Just as the ITU allocates a given frequency band for the purpose of its use by one or more service,[179] the ISA could follow the Institutional arrangements of the DBB and identify those celestial bodies or areas over them to be protected. The issue of the 'paper satellite' could arise in the exploitation of outer space as and its resources due to the not so realistic or rather tentative plans to mine, for which an 'administrative due diligence', as the one addressed for the GSO, could be implemented as to filter out those proposals that demonstrate the genuine will to use an assigned area or resource to exploit.[180] When the license for a site expires, the ISA could grant a new one under the same conditions addressed in the previous paragraph, and as guarantor of equity in space, parameters similar to the ones addressed in the Document A/AC. 105/738, annex III could be developed.

[177] Building-block 17. *Supra* note 104; NG, N. Fences in Outer Space: Recognizing Property Rights in Celestial Bodies and Natural Resources. The Western Australian Jurist. Vol. 7 (2016) at 164.

[178] UNCLOS annex III Article 8.

[179] No. 1.18 of Article 1. Radio Regulations. *Supra* note 136.

[180] Resolution 49. *Supra* note 143.

CHAPTER 4

CONCLUSIONS

The ideas and analysis addressed on this work have never intended to propose eliminating the chance to exploit outer space and its resources. On the contrary, it recognizes that the moratorium set forth in the Moon Agreement has arrived, and as such a regulatory framework is needed in order to give legal certainty to all the concerned actors. Further, the non-appropriation element, as a guiding principle for space activities, must continue being the cornerstone for future regulations.

The so-called postmodern society, is constantly changing, for which the Law should be dynamic as to ensure efficient, affective, appropriate and successful solutions that adapt the reality of the moment. As such, the controversial concept of *common heritage of mankind* has been accommodated across the years to the living and economic conditions of the stakeholders. Space Law is undoubtedly an example for the legal world, as it has shown that changes may occur in how Law is perceived. The 1994 Implementation Agreements and the 1996 Declaration on Space Benefits represent the mechanisms through which that notion has been given other chances to succeed, and which have the acceptance of both developed and developing countries.[181]

The trust intrinsic to the negotiation via consensus is the ideal ground to continue developing solid and efficient legislation that inspires respect for the regulations and principles in which it is based. International Cooperation is a fundamental principle in outer space, through which discrimination of any nature can be overcome. In the area of Space Law, international cooperation can eliminate social gaps of inequality through mutual help and support among States. History has shown that, in the absence of international cooperation, the dominant nature of certain countries has led to the exploitation of some areas and resources on Earth that have caused environmental damage, and have not considered at all involving less developed countries, taking away from them any possibility to obtain economic benefit of such areas. The freedom of using outer space finds its limits on international cooperation and, inspired in the principle of intergenerational equity, on the survival of mankind on Earth and in Outer Space.

The imbalance intrinsic to the existing gap between developed spacefaring nations and developing States may exclude the latter ones from access to the benefits of exploiting outer space and its resources, which could hamper the achievement of equity as addressed by all the studied legal regimes. Therefore, minimizing such inequities in scientific and technology cooperation agreements between these countries, for instance, may be a potential route forward. Additionally, although the potential of spacefaring nations will remain important, it is being diffused by more active, multilateral decision-making structures in which weaker States may organize blocking coalitions in defending their interests. Such trend might suggest that rules established on the basis of equity are more efficient and enduring than rules imposed by power.[182]

As studied, one single model does not suffice the needs of a new legal regime for the exploitation of space natural resources and, instead need to be replaced by several organizing principles. Hence, a better structured space regime will require more effective, collective decision-making processes, mechanisms to monitor and enforce compliance with the rules, supplemented by principles of equity and security.

[181] Tronchetti, F. *Supra* note 51, at 130.

[182] Tannenwald, N. *Supra* note 151 at 405

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