

# A Comparative Analysis between the Act on the Exploration and Use of Space Resources (Luxemburg) and the Commercial Space Launch Competitiveness Act (U.S.): Ways Forward for National Space Law

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## Abstract

The Act on the Exploration and Use of Space Resources (the Space Resources Act) adopted by Luxemburg Parliament in July 2017, in particular Article 1 which stipulates that “Space resources are capable of being appropriated”, has raised various discussions in the international community. Along with the U.S. Commercial Space Launch Competitiveness Act of 2015 (CSLCA), State Parties to the Outer Space Treaty (OST), which prohibits national appropriation of outer space whereby, has taken the first step towards an overall commercial exploitation of space resources by national recognition of private property rights thereon. Yet, such initiative, creating property rights over space resources obtained in missions conducted by private entities, has raised an inevitable question for other space-faring nations who might be State Parties to the OST or the Moon Agreement (MOON) or both of them: what should they do in their domestic laws?

The CSLCA, in particular Title IV, was deliberately designed in a way that obviously act in accordance with existing international law. However, it grants ownership and other rights of space resources only to citizens of U.S., because of which the controversies raised by this nationality-oriented approach are continuing to focus on if its unilateral interpretation does accord with Art. I and II of the OST. The Space Resources Act, however, by stipulating conformity with Luxemburg’s international obligations in Art. 2(3) in the Space Resources Act, has taken an approach that is heading to the same direction yet different goal. Luxemburg is neither one of the super space powers nor a potential one when it officially announced its ambition on a domestic regulatory framework for commercial space industries. At the current stage,

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the legal certainty provided by the Space Resources Act works for the blueprint for the promising commercial investment in the space field. This article examines the similarities and differences between the CSLCA, in particular Title IV, and the Space Resources Act. By such review, this article presents the legal interpretation of core principles of international space law which converge to States' practices on a national basis, and demonstrates to what extent are they in consistency with international space law to try to figure out for other States if there are more options of establishing a national legal framework for exploiting space resources.

## 1. Introduction

It has been the tendency in recent years that private entities are proactively seeking for exploitation of resources in outer space, which is not limited to but mainly focuses on natural resources of celestial bodies. Celestial bodies, such as the Moon, Mars, comets and asteroids, have been proved to be able to provide huge amounts of natural resources which are scarce on Earth or essential for space travels.<sup>1</sup> Studies show that the "value of each asteroid could be somewhere in the trillions [of dollars] or higher".<sup>2</sup> With the rapid pace of the development of space technology, space resource utilization is becoming acknowledged as an essential part of domestic space law, even for non-spacefaring nations. Apart from the long-lasting debate and change of divergent opinions expressed by officials and legal experts in various international conferences (such as those held by the United Nations Office for Outer Space Affairs, hereinafter UNOOSA) and forums, States are establishing different national law and policies for this emerging industry. Different domestic laws adopted by the United States and Luxembourg before establishing an international framework as stipulated in Article 11 of The Agreement Governing the Activities of States on the Moon and Other Celestial Bodies (hereinafter the Moon Agreement) have become quite controversial among the international community. This has also raised heated discussion in the session<sup>3</sup> of the Legal Subcommittee of the UN Committee on the Peaceful Uses of Outer Space (hereinafter COPUOS). However, it is satisfied that both of these two States' move, especially Title IV of the Commercial Space Launch Competitiveness Act (hereinafter CSLCA) of the

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1 Sarah Coffey, Establishing a Legal Framework for Property Rights to Natural Resources in Outer Space, 41 CASE WESTERN RESERVE JOURNAL OF INTERNATIONAL LAW 119, 119 (2009); Kevin MacWhorter, Sustainable Mining: Incentivizing Asteroid Mining in the Name of Environmentalism, 40 WILLIAM & MARY ENVIRONMENTAL LAW AND POLICY REVIEW 645, 652 (2016); Market For Metals, PLANETARY RESOURCES, <http://www.planetaryresources.com/asteroids/market-for-metals/>.

2 Kevin MacWhorter, *supra* n. 1.

3 Report of the Legal Subcommittee on its fifty-sixth session, held in Vienna from 27 March to 7 April 2017, COPUOS, 60th Sess., at 30-33, U.N. Doc A/AC.105/1122 (2017)

United States, has triggered the initiative to openly discuss issues concerning rights on space resources in UN meetings<sup>4</sup>. Domestic space law could be the ground of the long-drawn negotiation for a global legal regime of space resource utilization to the satisfaction of the international community.

## 2. Challenges Posed by International Law

The ambiguity of international space law needs to be discussed when it comes to the legality of space mining activities, especially such activities conducted by private entities. The purpose of the United States and Luxembourg stipulating property rights with regards to space resource utilization needs to be analyzed as well. Such domestic legal framework concerning the exploitation and use of space resources could provide to act as a model for space mining activities of other States.

From a legal perspective, the foremost challenge faced by States is apparently the *res communis* nature of outer space as enshrined in the 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).<sup>5</sup> According to Article I paragraph 2, outer space is free for access and use by States on the basis of equality and non-discrimination, which allows States to conduct activities in outer space without any permission from other governments.<sup>6</sup> This has granted outer space the nature of *res communis*. However, the non-appropriation principle stipulated in Article II has revealed a simple fact: States cannot claim exclusive property rights over outer space or celestial bodies.

American private entities such as Planetary Resources<sup>7</sup> and Deep Space Industries<sup>8</sup> had announced space mining plans on celestial bodies. From 2012 on, enterprises with different nationalities have publicized their ambition on investing in space resource utilization, even including building lunar base.<sup>9</sup> Private sector requires for a domestic legal framework to better regulate

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4 Report of the Legal Subcommittee on its fifty-fifth session, held in Vienna from 4 to 15 April 2016; COPUOS, 59th Sess., at 12-14, 38, U.N. Doc A/AC.105/1113 (2016)

5 Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies, entered into force Oct. 10, 1967, 18 U.N.T.S. 2410, 610 U.N.T.S. 205.

6 Stephan Hobe, Article I, I in COLOGNE COMMENTARY ON SPACE LAW 34 (Stephan Hobe, Bernhard Schmidt-Tedd & Kai-Uwe Schrogl eds. 2009)

7 Planetary Resources, Asteroid mining plans revealed by Planetary Resources, Inc., (2012) <http://www.planetaryresources.com/2012/04/asteroid-mining-plans-revealed-by-planetary-resources-inc/>

8 Alan Boyle, Deep Space Industries' lofty asteroid ambitions face high financial hurdles (2013) [http://cosmiclog.nbcnews.com/\\_news/2013/01/22/16647738-deep-space-industries-lofty-asteroid-ambitions-face-high-financial-hurdles](http://cosmiclog.nbcnews.com/_news/2013/01/22/16647738-deep-space-industries-lofty-asteroid-ambitions-face-high-financial-hurdles)

9 Sarah Scoles, The Japanese space bots that could build 'Moon Valley' (2018) <https://www.wired.com/story/the-japanese-space-bots-that-could-build-moon-valley/>

activities concerning space resource utilization, along with the flourish of space industry. The vagueness of the Outer Space Treaty has to some extent resulted in the United States and Luxembourg establishing their domestic space law to provide investors with legal certainties that they would need to conduct private space activities, in which the existing international space law is not fully clarified yet.

### 3. Comparison of Space Resources Act and of CSLCA

Space Resources Act and CSLCA were established with similar entitlements yet different focuses. When referring to space resource utilization, the former focuses on the “commercial” element as provided in Article 3 and Article 4<sup>10</sup> which put its emphasis on commercial purpose of mission applied by companies<sup>11</sup> (in various forms, though), while the latter put its emphasis on citizenship without limitation on grantees.

#### 3.1 Space Resources Act

On July 13<sup>th</sup> 2017, the parliament of Luxembourg voted for the passage of the new space resources law, which means the Act, named the Act on the Exploration and Use of Space Resources (hereinafter the Space Resources Act) will become law on August 1<sup>st</sup> 2017.<sup>12</sup> This Act makes Luxembourg the first European country to establish the legislation granting private sectors the legal certainty regarding the ownership of space resources extracted from outer space.<sup>13</sup> By recognizing that space resources are capable of being owned in its very first Article,<sup>14</sup> this Act has become the focus of controversy from the international community. Being the second adopter of a domestic legal framework concerning the appropriation of space resources, Luxemburg has also stipulated the authorization and supervision procedures for missions attempting to exploit and utilize space resources. Since Luxemburg has not been considered as a space-faring nation with significant space capabilities, this Act, allowing Luxemburg to grow as a global hub for space activities, could be deemed as implemented out of financial concerns.

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10 Supra n. 5, art. 3 & art. 4.

11 Id. Article 4 of Space Resources Act has stipulated two conditions for applicants: 1. the form of the company; 2. physical existence in Luxembourg.

12 Jeff Foust, Luxembourg adopts space resources law (2017) <https://spacenews.com/luxembourg-adopts-space-resources-law/>

13 The official portal of the Grand Duchy of Luxembourg, A legal framework for space exploration (2017) <http://luxembourg.public.lu/en/actualites/2017/07/21-spaceresources/lindex.html>

14 Loi du 20 juillet 2017 sur l’exploration et l’utilisation des ressources de l’espace [Law of July, 20 2017 on the Exploration and Use of Space Resources], Mémorial A, n° 674, July 28th 2017, art. 1 (Lux.) (emphasis added).

As stipulated in Article 1, “space resources are capable of being appropriated”,<sup>15</sup> the direct and clear language of which has expressed its determination on the recognition of the private appropriation of space resources. As to the question of whether the terminology of Article 1 is in accordance with international law, especially the non-appropriation principle, the Conseil d’Etat of Luxembourg stated its opinion as that international law does not prevail on national law.<sup>16</sup> Apparently, for Luxembourg, the non-appropriation issue is not of Luxembourg’s attention. The biggest challenge for Luxembourg is how to build the mechanism for the authorization and supervision of space mining missions. The rationale of Article 1 was not further discussed in this Act.

For private entities seeking to appropriate space resources under Luxembourg’s regulatory framework, which are defined as the Operator, the Space Resources Act provides loads of requirements in various aspects. Its key components could be concluded as follows: (1) the Operator must obtain a written authorization from the appropriate minister(s) in Luxembourg; (2) the Operator must either be a public company limited by shares (*société anonyme*), a corporate partnership limited by shares (*société en commandite par actions*), a private limited liability company (*société à responsabilité limitée*) or a European Company (*société européenne*); (3) the Operator’s central administration and registered office must be located in Luxembourg; (4) the Operator shall demonstrate a sound and prudent operation; (5) the Operator’s annual accounts shall be audited by independent auditor(s), and (6) there must be a risk assessment of the mission(s) in the application for authorization.<sup>17</sup> Since Article 4 also allows for the applicability of European companies with registered office in Luxembourg, considering that Luxembourg does not have its own launching platforms, this Act is apparently aiming for becoming the hub for European space mining industry by attracting private sectors.

The Space Resources Act is not merely solitary, but also belongs to the Luxembourg national strategy to promote this country as the space industry hub of Europe. As the European center of the space mining business, Luxembourg has committed 200 million euros to fund space exploration related companies.<sup>18</sup> The funding is designed to encourage ventures and

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15 *Supra* n. 5, art. 1.

16 Conseil d’État, *Projet de loi sur l’exploration et l’utilisation des ressources de l’espace*, N°51.587, p. 9 (7 Avril 2007) (Lux.)

17 See the English version of Draft law on the exploration and use of space resources (The French version prevails) at <https://spaceresources.public.lu/content/dam/spaceresources/news/Translation%20Of%20The%20Draft%20Law.pdf>; See the French version at <http://legilux.public.lu/eli/etat/leg/loi/2017/07/20/a674/jo>

18 Laurent Thailly, Luxembourg set to become Europe’s commercial space exploration hub with new Space Law (2017) <https://www.ogier.com/news/the-luxembourg-space-law>

foreign space mining companies such as US enterprises to fix their European headquarters in Luxembourg. Several companies have already built their head offices in Luxembourg or have cooperated with Luxembourg government to finance their proposed missions.<sup>19</sup>

### 3.2 CSLCA

The CSLCA, passed in 2015, by granting property rights over space resources,<sup>20</sup> enables US citizens to “engage in commercial exploration for and commercial recovery of space resources [including ... water and minerals] free from harmful interference.”<sup>21</sup> This Act specifically asserts that “the United States does not thereby assert sovereignty or sovereign or exclusive rights or jurisdiction over, or the ownership of, any celestial body.”<sup>22</sup> Except for the unprecedented Articles concerning exploration and utilization of space resources, the CSLCA also includes the extension regarding the “learning period” restrictions which limit the ability of the Federal Aviation Administration (hereinafter FAA) from enacting regulations with regard to the safety of spaceflight participants.<sup>23</sup> The most significant part, despite of other important amendments which should not be overlooked, is its Title IV that allows US citizens, individuals or legal persons, to enjoy every possible right over anything they brought back from outer space.

The CSLCA has reflected the legal needs of a rapidly flourishing industry and it aims at encouraging the competitiveness of the US commercial space industry. CSLCA’s key components could be concluded as follows: (1) Recognizing property rights of US citizens over obtained space resource, including possess, own, transport, use, and sell those resources; (2) Extending the operation of the International Space Station (hereinafter ISS) with a four-year extension of the ISS into 2024, ensuring ISS remains productive for scientific and commercial purposes; (3) Ensuring the continued development of space industry with a five-year extension of the regulatory learning period through 2020 to encourage the commercial space sector; (4) Streamlining the process for launch license from FAA; (5) Setting oversight mechanism for oversight of commercial space activities conducted by private sectors that would promote the US commercial space sector while meeting obligations of US under international treaties; (6) Defining “Government Astronaut” as

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19 Id.

20 Section 402 §51301 (2)(B) defines space resource as “an abiotic resource in situ in outer space” including minerals and water. Under CSLCA’s context, space resource refers to resources originated from and located in outer space excluding biological life thereof.

21 H.R.2262 - U.S. Commercial Space Launch Competitiveness Act, Sec. 51301 <https://www.congress.gov/bill/114th-congress/house-bill/2262/text>

22 Id, Sec. 403.

23 Id, Sec. 111.

special spaceflight passenger, differing from crew and “spaceflight participants”.<sup>24</sup>

As for Title IV, which is probably one of the most criticized when this Act was passed, there is one noteworthy thing about this Title -- the terminology “asteroid resource” and “space resource” are defined separately, with asteroid resource being defined in the first sentence of this paragraph. The language of this paragraph implies that US is setting the legal stage for space mining activities, although this Act was developed for a rather broad purpose “to facilitate a pro-growth environment for the developing commercial space industry”. To be more specific, the purpose of Title IV is to “facilitate commercial exploration and commercial recovery of space resources by the U.S. citizens”. Therefore, at this stage, CSLCA clearly aims at granting private entities with US citizenship the property rights on natural resources extracted by conducting space mining.

This is not to say that US citizens are allowed to do anything in outer space protected by domestic umbrella. To this extent, the applicability of Title IV is subjected to delicate legal conditions. CSLCA promotes that governmental barrier should not discourage “discourage government barriers to the development in the United States of economically viable, safe, and stable industries for commercial exploration for and commercial recovery of space resources in manners consistent with the international obligations of the United States”.<sup>25</sup> Therefore, the authority should be limited to ensure that the space mining activities conducted by US citizens do not “jeopardize public health and safety, safety of property, U.S. national security or foreign policy interests, or international obligations [of the U.S.]”.<sup>26</sup>

Although being criticized, the entitlement provided by Title IV is nevertheless a valuable reference for space-faring States heading to establish domestic space law, at least it could be a good model for domestic framework before the Moon Agreement could finally be widely recognized with international regime of Article 11<sup>27</sup> being discussed on an international plane.

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24 Supra n. 21.

25 Supra n. 21, Sec. 51301 (a)(2).

26 Joanne Gabrynowicz, Title IV of the 2015 U.S. Commercial Space Launch Competitiveness Act (2017), <http://www.unoosa.org/documents/pdf/copuos/lsc/2017/symp-05.pdf>.

27 As provided by Article 11 paragraph 5, “States Parties to this Agreement hereby undertake to establish an international regime, including appropriate procedures, to govern the exploitation of the natural resources of the Moon as such exploitation is about to become feasible.” The Moon Agreement may have to wait for a long time until space forces start to negotiate about the regime insofar as it has only 18 State Parties, see [http://www.unoosa.org/documents/pdf/spacelaw/treatystatus/AC105\\_C2\\_2018\\_CRP03E.pdf](http://www.unoosa.org/documents/pdf/spacelaw/treatystatus/AC105_C2_2018_CRP03E.pdf)

### 3.3 Accordance with Treaty Interpretation

International debates has been focused on if the unilateral move by Luxembourg and US would result in the violation of principles of international law, while another aspect, the way of sharing benefits originating from the utilization of space resources, needs to be considered as well, since it is widely recognized that considerable profits would come from space mining.

As long as space resource utilization is becoming feasible for private parties in the very near future, it should be questioned that whether specific articles of CSLCA and Space Resource Act comply with the non-appropriation principle stipulated in the Outer Space Treaty, which is widely recognized as Magna Carta of international space law.<sup>28</sup> The first step to resolve this is to ask if space mining constitute the so-called “appropriation”. For clarifying this, the definition of national appropriation needs to be discussed as well. Moreover, regarding interests of other States as stated in Article IX, is it possible and to what extent does private appropriation contradict with this clause? Such kinds of questions have long been discussed by various parties and this situation is clearly to be continued.<sup>29</sup>

The core issues concerning national laws of space resource utilization could then be concluded as follows: Firstly, does the commercial use of outer space fall within the scope of Article I paragraph 2 of the Outer Space Treaty? Secondly, in what way and to what extent would the benefits arising from such activities be shared equally by all countries, despite of their economical situations? Thirdly, does private appropriation of space resources constitute contravention to customary law?<sup>30</sup>

As commented by Deputy Prime Minister and Minister of the Economy Etienne Schneider: “The legal framework we put in place is perfectly in line with the Outer Space Treaty. Our law does not suggest to either establish or imply in any way sovereignty over a territory or over a celestial body. Only the appropriation of space resources is addressed in the legal framework.”<sup>31</sup>

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28 Vladlen Stepanovich Vereshchetin & G. M Danilenko, Custom as a source of international law of outer space, 131 *Journal of space law*, 31 (1985); UN GA Res. 1962 (XVIII), UN GAOR, 18th Sess., UN Doc. A/RES/18/1962 (1963)

29 Ricky Lee, *Law and Regulation of Commercial mining of minerals in Outer Space*, p.153–202 (2014).

30 Fabio Tronchetti, *The Space Resource Exploration and Utilization Act: A move forward or a step back?*, 34 *JSPA SPACE POLICY* 8 (2015); IISL Directorate of Studies, Background Paper: *Does International Space Law Either Permit Or Prohibit The Taking Of Resources In Outer Space And On Celestial Bodies, And How Is This Relevant For National Actors? What Is The Context, And What Are The Contours And Limits Of This Permission Or Prohibition?* (2016)

31 The Luxembourg Ministry of the Economy, *Luxembourg’s New Space Law Guarantees Private Companies the Right to Resources Harvested in Outer Space in Accordance with International Law* (2016) <https://gouvernement.lu/fr/gouvernement/etienne-schneider/actualites.gouvernement%2Bfr%2Bactualites%2>



It could be seen that one of the most reasonable ground Luxembourg takes is that the Outer Space Treaty had not explicitly referred to neither the use of in situ space resources nor rights generated from commercial use.

According to Article I paragraph 2 and paragraph 3, the scope of activities in outer space which are granted freedom include exploration, use, and scientific investigation.<sup>32</sup> The terminology “exploration and use” does not necessarily preclude other uses, such as commercial use and exploitation, from the context of the Outer Space Treaty. As for paragraph 3, the scientific element is not the sole core of this clause, or it could totally be integrated into paragraph 2 along with “exploration and use”. Apparently, paragraph 3 has put its emphasis on promoting international cooperation. The commercial space activities conducted in modern society are highly probable to involve scientific investigation and international cooperation, which makes them conforming to Article I. The non-appropriation principle enshrined in Article II explicitly prohibits national appropriation by any means including use or occupation,<sup>33</sup> yet the prohibition of private appropriation is nowhere to be found in the Outer Space Treaty while other uses going against the spirit and purpose of this Treaty are specifically mentioned in other provision, such as the prohibition on in-orbit nuclear weapons and lunar military bases.<sup>34</sup> Therefore, it is natural to reason that commercial use of outer space, including private appropriation on space resources obtained by extraction or other means, does not constitute violation of the Outer Space Treaty. What Luxembourg and US need to be cautious of, is the easily-misleading transition of appropriation to “national” appropriation. Moreover, the commercial-oriented interpretation only stands sound so long as other principles and provisions get to be duly observed as well.<sup>35</sup>

Further regarding commercial use, Article I paragraph 3 of the Outer Space Treaty apparently recognizes and encourages the scientific use of outer space by providing for the freedom to conduct scientific investigation. However, commercial use of outer space and its resources are not clearly referred to in this treaty, or at least not as clear as the promotion for scientific use. Due to the high value of natural resources in outer space, space resource utilization, especially space mining, does have a promising blueprint originating from the considerable profit of this industry. However, although the means of exploiting and utilizing space resources will definitely involve the process of

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32 Supra n. 5, Art. I para 2&3.

33 Supra n. 5, Art. II.

34 Supra n. 5, Art. IV para 1&2.

35 Supra n. 29, p. 41.

scientific investigation,<sup>36</sup> commercial profit is still the primary goal of space mining.<sup>37</sup>

The recognition from CSLCA on relevant rights over space resources depends on three major factors: (1) the entity must have US citizenship; (2) the entity has to receive an authorization from the State; and (3) the entity's space mission must comply with the international obligations of US.<sup>38</sup> As for compliance with international law, the obligation of authorization and supervision of States over national space activities has been reflected in Title IV, which stipulates that missions will be reviewed by the State to make sure the accordance with international obligations of US.

The rather controversial issue of Title IV is concerning the prohibition of national appropriation under Article II of the Outer Space Treaty. In Sec. 403, it reads that "It is the sense of Congress that by the enactment of this Act, the United States does not thereby assert sovereignty or sovereign or exclusive rights or jurisdiction over, or the ownership of, any celestial body."<sup>39</sup> Hence, the IISL holds the opinion that the legislative effort of US to the entitlement of space resources was "independent from the claim of sovereign rights over celestial bodies, which the United States explicitly does not make".<sup>40</sup>

Therefore, rather than exploiting the advantage of Article II of the Outer Space Treaty, it could be acknowledged that the establishment of CSLCA has initiated a national process that ensures the observation of and further establishment of international law.

#### **4. Implications of Space Resources Act and CSLCA and Their Effects on Other States**

Currently, the inherent question of the controversial situation where the Space Resources Act and CSLCA stand, is not how to interpret the Outer Space Treaty in terms of "commercial use" or "appropriation" or "property rights", but rather how to ensure the commercial use being carried out "for the benefit and in the interests of all countries" and being "the province of mankind".<sup>41</sup> The real reason of space mining raising the issue is that it is hard to negotiate an equal form of sharing of the benefit deriving from space mining thereof. For past years, outer space has been used mainly as platform for providing services. Exploiting natural resources in outer space will soon be feasible in the new era. Hence, the international community need to move

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36 ISPACE, Expand Our Planet, Expand Our Future, <https://www.youtube.com/watch?v=5cMEJTnPq-I>.

37 Kevin MacWhorter, *supra* n. 1.

38 *Supra* n. 21.

39 *Id.*

40 IISL, Position Paper on Space Resource Mining (2015)

41 *Supra* n. 5, Art. I para 1.

fast to be legally prepared on both domestic and international strings on their bows, to catch up with the pace of the development of scientific technology.<sup>42</sup> However, there is no further explanation in the Outer Space Treaty of what exactly constitute “benefit” and “interest” deriving from the use of outer space. It could also be deduced that private companies, whose primary goal is to make profits, would tend to be reluctant to share profits they could possibly earn from space resource utilization, yet the States that entitled them with property rights over space resources are still bound by treaty obligations. This is an economic reality that private entities, States enacted domestic space law and the international community need to face. More bilateral or multilateral agreements and State practices are needed to deal with this dilemma.

On the domestic plane, the legal framework of the Space Resources Act may not necessarily be applicable to all nations. The issue of whether the property rights granted by this Act could be accepted by other countries still remains to be debated,<sup>43</sup> due to that domestic laws, such as the Space Resources Act and CSLCA, are only binding under the sovereignty of the State enacted it. On one hand, a State is not obliged to recognize the property rights of a foreign entity on the territory of another State, on the other, space resource has long been considered as *res communis*, the nature of which makes it free from any jurisdiction. Yet, “every State has and shall freely exercise full permanent sovereignty, including possession, use and disposal, over all its wealth, natural resources and economic activities”, thus the property rights over space resources do not necessarily have to be restricted by this.<sup>44</sup> After all, there is no necessary opposition between constituting domestic legal framework and establishing an international regime on the utilization of space resources.

## 5. Conclusion

In reality, it is quite possible that until private companies start to retrieving space resources or at least to send probes to wherever they will exploit, no practical progress toward an international regime will be made.<sup>45</sup> For spacefaring nations without explicit regulations concerning rights on natural space retrieved from outer space, such as China and Japan, it could well serve the national interests to realize the initiative in every sense, since the legality of appropriation is gradually fading from the most heated arena while US

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42 *Supra* n. 4, p. 38.

43 Opinion of the Conseil d’État *op. cit.* n. 20, p. 6.

44 UNGA Res. 3281(xxix), UN GAOR, 29th Sess., art. 2(1), UN Doc. A/RES/39/163 (1974)

45 Karla Lant, *Ambiguous Laws Could Prevent Us from Taking Full Advantage of Celestial Resources* (2017) <https://futurism.com/ambiguous-laws-could-prevent-us-from-taking-full-advantage-of-celestial-resources/>

and Luxembourg have provided for more urgent issues. For non-spacefaring nations, even if these considerations may not be a priority at this stage, they are still another facet of a more critical concern: establishing a new international regime or new agreements will have to be based on various grounds. The issue of determining how should benefit be shared could only arise from negotiating the utilization of space resources. Should the spacefaring nations reach a consensus to follow the theory of “first come, first served” in spite of international law, these issues would be replaced by more complicated politics. Hence, it is primordial to consider various forms of international cooperation with the present situation of space resource utilization, if one wishes not to be a latecomer in this booming industry.