Avatar Film
Perspectives from Space Law

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Abstract

Avatar is a 2009 American epic science fiction film set in 2154, when humans depleted Earth's natural resources, leading to a severe energy crisis. The mining company RDA (Resources Development Administration) exploits for a valuable mineral – unobtanium – on Pandora, a densely forested habitable moon of gas giant in the Alpha Centauri star system. Unobtanium is a room-temperature superconductor that can mitigate the Earth's energy crisis, but the expansion of the mining colony threatens the continued existence of a local tribe of Na'vi, a 10-foot tall (3.0 m), blue-skinned, sapient humanoids. To explore Pandora, whose atmosphere is poisonous to humans, scientists use Na'vi-human hybrids called "avatars", operated by genetically matched humans. Using this strategy, RDA intends to get intelligence about the Na'vi and the clan's gathering place, a giant arboreal called Hometree, on grounds that it stands above the richest deposit of unobtanium in the area. RDA heavily militarized its base and its personnel and had no restrictions in using this arsenal against anyone who tried to prevent the unobtanium's exploitation. Based on this plot, it can be assured that Avatar film is a rich case of study to Space Law, because it provides several situations where the international legal framework should be applicable. Did RDA get authorization from its State to exploit Pandora, according to Article 6 of the 1967 Space Treaty? Could RDA have installed a base in Pandora? Could RDA have militarized Pandora, by taking and placing weapons there? This paper aims to answer these questions, as well as to give other examples where the Space Law is reflected on the movie. The Treaty that regulates the exploration of the Moon and other celestial bodies is in analogy applicable to the Na'vi's homeland, so this paper also compares the Pandora's exploitation with the current discussions about the possibility of exploiting the Moon and asteroids.

I. Introduction

The rewarded director James Cameron directed, produced, and co-edited the record-breaking film Avatar. Avatar was officially budgeted at US$ 237 million,

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but other estimates put the cost between US$ 280 million and US$ 310 million for production and at US$ 150 million for promotion. Avatar premiered in London on 10 December 2009, and was internationally released on 16 December 2009 and in the United States and Canada on 18 December 2009, to positive critical reviews, with critics highly praising its groundbreaking visual effects.
During its theatrical run, the film broke several box office records and became the highest-grossing film of all time, as well as in the United States and Canada, surpassing Titanic, which had held those records for twelve years (and was also directed by Cameron). It also became the first film to gross more than US$ 2 billion, and the best-selling film of 2010 in the United States. Avatar was nominated for nine Academy Awards, including Best Picture and Best Director, and won three, for Best Art Direction, Best Cinematography and Best Visual Effects.
Following the film's success, Cameron signed with 20th Century Fox to produce three sequels, making Avatar the first of a planned tetralogy. The three sequels, all directed and co-written by Cameron, will be released each year starting from December 2017 to 2019.[1] Cameron probably did not realize that his spectacular film had so many implications in the area of Space Law, how it is expected to be shown in this paper.

II. Space Activities Carried out in a Celestial Body

In 2154, due to a severe energy crisis caused by the mitigation of Earth's natural resources, a private company, probably to attend a request from a specific State, decided to exploit resources from celestial bodies due to the great commercial potential of this activity. The mining company RDA (Resources Development Administration) established a base in Pandora, with a view to exploit for a valuable mineral – unobtanium – that could reduce the Earth's energy crisis. Therefore, a terrestrial company established a base in a celestial body – Pandora – where it was carrying out space activities. Since RDA is a private company, at a first glance someone could say that the international legal framework for space activities is not applicable to this case. In this particular aspect, Article VI of the Outer Space Treaty has to be highlighted:

> "States Parties to the Treaty shall bear international responsibility for national activities in outer space, including the Moon and other celestial bodies, whether such activities are carried on by governmental entities or by non-governmental entities, and for assuring that national activities are carried out in conformity with entities in outer space, including the Moon and other celestial bodies, shall require authorization and continuing supervision by the appropriate State Party to the Treaty. When activities are carried on in outer space, including the Moon and other celestial bodies, by an international organization, responsibility for

1 Data from https://en.wikipedia.org/wiki/Avatar_(2009_film).

> compliance with this Treaty shall be borne by the international organization and by the States Parties to the Treaty participating in such organization".

Therefore, RDA had to have obtained authorization from its appropriate State to carry out space activities in Pandora. On the other hand, the appropriate State had to exercise strict surveillance on the activities carried out by RDA, because it had responsibility for the actions taken in Pandora, including the exploitation of mineral resources and the treatment for the local population. The principle of the State responsibility for space activities carried out by its own nationals is fully accepted by the international community.

III. The Establishment of a Base in a Celestial Body

Since RDA established a base in Pandora, which is considered a celestial body although it does not belong to the Earth's solar system, particular attention must be paid to Article II of Outer Space Treaty: "Outer Space, including the Moon and other celestial bodies, is not subject to national appropriation by claim of sovereignty, by means of use or occupation, or by any other means". Therefore, in accordance with Article II of the Outer Space Treaty, despite the establishment of a base in Pandora, RDA had no right of ownership or any property on that celestial body. In this context, RDA could keep its infrastructure in Pandora on a conditional basis, only for a sufficient period within which it would carry out its activities of exploration, using and maintenance of its assets, but not for mineral exploitation.
On the other hand, the exploitation of unobtanium from Pandora would only be admitted if there was an international legislation to regulate such an activity. Since other States Parties of the Outer Space Treaty, or even their private companies, could have interest on carrying out space activities in Pandora, before giving authorization to RDA, the appropriate State might have submitted prior consultations with other States Parties to the Outer Space Treaty, as provided in Article IX:

> "[…] If a State Party to the Treaty has reason to believe that an activity or experiment planned by it or its nationals in outer space, including the Moon and other celestial bodies, would cause potentially harmful interference with activities of other States Parties in the peaceful exploration and use of outer space, including the Moon and other celestial bodies, it shall undertake appropriate international consultations before proceeding with any activity or experiment. A State Party to the Treaty which has reason to believe than an activity or experiment planned by another State Party in outer space, including the Moon and other celestial bodies, would cause potentially harmful interference with activities in the peaceful exploration and use of outer space, including the Moon and other celestial bodies, may request consultation concerning the activity or experiment".

It is important to emphasize that:

a. the mentioned Article IX of the Outer Space Treaty must be updated, because at the time when it was issued, over than 45 years ago, the technological development was not able to forecast the current discussions about the exploitation of the Moon and other celestial bodies;
b. the exploitation of the Moon and other celestial bodies is conditioned to the establishment of an international legislation which will regulate such an activity;
c. the international legislation which will regulate the exploitation of the Moon and other celestial bodies may follow the provisions of the Article 11 of the Moon Agreement, especially its paragraphs 5, 6 and 7, regarding the establishment of an international legal regime.

IV. The Militarization of Pandora

With a view to exploit Pandora without any resistance from the natives, RDA took an impressive arsenal of weapons to that celestial body. Hence, there was a flagrant case of militarization of a celestial body. On this subject, Article IV of the Outer Space Treaty foresees:

> "[…] The Moon and other celestial bodies shall be used by all States Parties to the Treaty exclusively for peaceful purpose. The establishment of military bases, installations and fortifications, the testing of any type of weapons and the conduct of military manoeuvers on celestial bodies shall be forbidden […]".

Beyond that, dispositions of the United Nations Charter should also be respected, in accordance with Article III of the Outer Space Treaty, *in verbis:*

> "States Parties to the Treaty shall carry on activities in the exploration and use of outer space, including the Moon and other celestial bodies, in accordance with international law, including the Charter of the United Nations, in the interest of maintaining international peace and security and promoting international cooperation and understanding".

Article 1, paragraph 1, of the UN Charter states that the primary purpose of the United Nations is

> "to maintain international peace and security and to that end: take effective collective measures to prevent threats to peace and the suppression of acts of aggression or other breaches of the peace by peaceful means and in conformity with the principles of justice and international law, adjustment or settlement of international disputes or situations which might lead to a breach of peace".

Therefore, the UN Charter prohibits not only the use of force among countries, but also the threat of use of force. Francisco Rezek, a Brazilian jurist, former Judge of the International Court of Justice, affirms that there are currently only

two hypotheses for a just war, it means a lawful use of force: the legitimate defense against aggression and sustained armed struggle for self-determination of a people against a colonial domination.[2] In this context, it is important to point out that RDA was trying to colonize Pandora and impose slavery to the locals, in order to exploit freely unobtanium. Therefore, the Declaration on the Granting of Independence to Colonial Countries and Peoples, approved by the United Nations General Assembly Resolution 1514 (XV) of 14 December 1960, was infringed. Paragraphs 1 and 2 of this mentioned Declaration state that:

> "1. The subjection of peoples to alien subjugation, domination and exploitation constitutes a denial of fundamental human rights, is contrary to the Charter of the United Nations and is an impediment to the promotion of world peace and co-operation.
> 2. All peoples have the right to self-determination; by virtue of that right they freely determine their political status and freely pursue their economic, social and cultural development […]".

The right of self-determination is one of the purposes of the United Nations, as mentioned in Article 1, paragraph 2 of the UN Charter:

> "Article 1 – The purposes of the United Nations are:
> […]
> 2. To develop friendly relations among nations based on respect for the principle of equal rights and self-determination of peoples, and to take other appropriate measures to strengthen universal peace".

Therefore, the appropriate State infringed the right of life and self-determination of Na'vis, because it allowed RDA to colonize Pandora. Although the UN Charter refers to human rights, it seems that its provisions can also include civilizations from other planets. In fact, undoubtedly the inhabitants of other worlds must be treated like us, human beings. The collective use of force against another State is an exclusive decision of the Security Council of the United Nations, as establishes Article 24 of the UN Charter:

> "1. In order to ensure prompt and effective action by the United Nations, its Members confer on the Security Council primary responsibility for the maintenance of international peace and security, and agree that in carrying out its duties under this responsibility the Security Council acts on their behalf.
> 2. In discharging these duties, the Security Council shall act in accordance with the Purposes and Principles of the United Nations. The specific powers

2 Rezek, Francisco. *Direito Internacional Público* (International Public Law), in Portuguese. São Paulo: Saraiva, 2005, p. 373.

> granted to the Security Council for the discharge of these duties are laid down in Chapters VI, VII, VIII, and XII".

David Rodin stresses: "National defense is currently the sole casus belli explicitly recognized in law as a justification for the use of force by States without Security Council authorization".[3] Article 51 of the UN Charter states:

> "Nothing in the present Charter shall impair the inherent right of individual or collective self-defense if an armed attack occurs against a Member of the United Nations, until the Security Council has taken measures necessary to maintain international peace and security. Measures taken by Members in the exercise of this right of self-defense shall be immediately reported to the Security Council and shall not in any way affect the authority and responsibility of the Security Council under the present Charter to take at any time such action as it deems necessary in order to maintain or restore international peace and security."

The aforementioned David Rodin remarks that "the right of national-defense may deter aggression, but it may also serve as a mask and justification for dangerous military adventurism, particularly when the right is liberally interpreted".[4] The most modern and advanced weapons, excepting those defined as of mass destruction – nuclear, chemical and biological – have today free access to outer space. Article IV of the Outer Space Treaty prohibits only the placement, installation or station of these weapons into Earth's orbit. When weapons of mass destruction cross outer space, it does not mean putting them into Earth's orbit nor installing or stationing them in some way in outer space. Therefore, it seems to be allowed. But to prevent conflicts anywhere, this dangerous situation must be changed.

Turning to Avatar film, RDA may justify the placement of weapons in Pandora as a way of protecting its employees against the Na'vis attacks. However, it cannot be ignored that in this case, human beings were the aliens. Hence, the right of self-defense cannot be used in cases of invasion. In this scenario, we shall conclude that the appropriate State could not have authorized RDA to install and station weapons in Pandora.

The right of self-defense, mentioned in Article 51 of the UN Charter is not applicable to the case, because the aggression was caused by RDA and not by the natives. Beyond that, the right of self-defense is only valid for a State and not for a private company, such as RDA.

Therefore, RDA was obliged to use a peaceful approach with the locals, in order to try to exploit unobtanium under their permission and conditions.

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3 Rodin, DavId., *War and self-defense*, U.S., New York: Oxford University Press, 2002, p. 107.

4 Rodin, DavId., op. cit., p. 117.

V. The Exploitation of Mineral Resources from a Celestial Body

RDA established a base in Pandora with a view to exploit unobtanium, a room temperature superconductor than could mitigate the Earth's energy crisis.
According to RDA's experts, the richest deposit of unobtanium was situated below a giant arboreal called Hometree, a sacred place for the natives. RDA's strategy was to send avatars to Pandora and establish a close relationship with the Na'vi's tribe, with a view to get detailed information about the unobtanium's gathering place.
First of all, it is important to emphasize that someone could say that the Moon Agreement, specifically its Article 11, is not applicable to Pandora, because it does not belong to the Earth's solar system. Actually, Pandora is located at the Alpha Centauri star system. It is worth to remember that Article 1, paragraph 1 of the Moon Agreement foresees that the provisions of the Agreement related to the Moon "shall also apply to other celestial bodies within the solar system [...]" However, since there is no international legal framework to celestial bodies beyond our solar systems, it seems that the analogy with the disposition of the Moon Agreement is fully valid.
Turning to the Earth's current scenario, the natural resources have been used almost to the exhaustion, which has been caused serious concerns about the life for human's future generations. Regarding the sources of energy, the use of charcoal and petrol has poisoned the atmosphere. On the other hand, the use of nuclear energy always brings the risk of accidents, as those that happened in Chernobyl, Ukraine, in 1989; and in Fukushima, Japan, in 2013.
The use of clean sources of energy, such as solar energy and eolic energy, is not suitable to all countries, especially those situated near the North Pole. Beyond that, the energy generated by clean sources is usually not enough to attend the big companies' needs. Water is the main source of energy in Brazil. However, the Southeast Region of Brazil, the richest in the country, has been facing the worst drought of the past 85 years, dramatically affecting energy production by hydroelectric plants. This fact has drawn the attention of the Brazilian authorities to the rational use of water, as well as to the need of improving the use of other sources of energy, such as solar energy and eolic energy, abundant in a huge and tropical country as Brazil. Taking into account the mitigation of natural resources, some companies have been considered the possibility of exploiting mineral resources from the Moon and other celestial bodies.
Peter Diamandis, founder of the Planetary Resources, the first company devoted to the exploitation of asteroids, states that "all natural resources as you can imagine, energy, metals, minerals and water, there are virtually endless quantities in outer space". Diamandis is the creator of the X Prize competition that gives US$ 10 million prize to whoever can perform certain technological achievement (like sending a robot to the Moon or to create a machine capable of reading DNA at high speed, for example). Deep Space Industries is

other company that is interested in this subject – exploitation of asteroids. The four most desirable asteroids are:

1. 16238 – Diameter: 600 meters; distance from Earth: 12 million Km; estimated value already discounting the cost of mission: US$ 6.9 trillion;
2. 4034 Vishunu – Diameter: 420 meters; distance from Earth: 1.5 million Km; estimated value already discounting the cost of mission: US$ 5.28 trillion;
3. 65679 – Diameter: 730 meters; distance from Earth: 1.9 million Km; estimated value already discounting the cost of mission: US$ 1.74 trillion;
4. 7753 – Diameter: 1000 meters; distance from Earth: 1 million Km; estimated value already discounting the cost of mission: US$ 1.31 trillion.[5]

Prof. Ian Crawford, from the University of London – UK, points out:

> "Recent work has shown that the Moon does possess materials suitable for ISRU ('In Situ Resource Utilization'). Most important in this respect is evidence for deposits of water ice and other volatiles trapped in cold (less than 100 Kelvin or minus 173 degrees Celsius) and permanently shadowed craters at the lunar poles. In addition to being required for human life support, water is also a ready source of oxygen (required for both life support and rocket fuel oxidiser) and hydrogen (a valuable rocket fuel)".[6]

He stresses that

> "lunar surface rocks and soils are rich in potentially useful but heavy (and thus expensive to launch from Earth) raw materials such as magnesium, aluminium, silicon, iron and titanium. Therefore, if a lunar industrial infrastructure is gradually built up, the Moon may be able to provide more sophisticated products to Earth-orbiting facilities. Examples might include titanium and aluminium alloys for structural components and silicon-based photovoltaic cells for solar power".

Prof. Crawford advocates the possibility of exploiting the Moon based on the following arguments:

> "1. We have the option of using lunar materials to facilitate continued exploration, and future economic development, of the Moon itself. The concept is usually referred to as In Situ Resource Utilisation, or ISRU.
> 2. We could make use of lunar resources to facilitate scientific and economic activity in the vicinity of both Earth and Moon (so-called cis-lunar space) as well as future exploration deeper into the Solar System
> 3. We can consider the importation of lunar resources to the Earth's surface where they would contribute directly to the global economy".

5 http://super.abril.com.br/ciencia/a-pedra-de-r-5-trilhoes.
6 In his article "Why We Should Mine the Moon".

The current lack of a legal framework for the use of space mineral resources found on asteroids and other celestial bodies is already worrying the space lawyer's community. The Hague Institute for Global Justice convened a Roundtable on the Governance of Space Mineral Resources with a selected group of experts on 1 December 2014, attended by industrial leaders, scientists, diplomats, as well as political and legal experts from across the globe. Following the Roundtable, the initiative was taken to set-up The Hague Space Mineral Resources Governance Working Group to support this process and promote its advancement, within a reasonable timeframe and in accordance with international law. It is important to remember that Article 4 of the Moon Agreement states that:

> "1. The exploration and use of the Moon shall be the province of all mankind and shall be carried out for the benefit and in the interest of all countries, irrespective of their degree of economic or scientific development. Due regard shall be paid to the interests of present and future generations as well as to the need to promote higher standards of living and conditions of economic and social progress and development in accordance with the Charter of the United Nations.
> 2. States Parties shall be guided by the principle of cooperation and mutual assistance in all their activities concerning the exploration and use of the Moon. International cooperation in pursuance of this Agreement should be as wide as possible and may take place on a multilateral basis, on a bilateral basis or through international intergovernmental organizations."

Attention must also be paid to Article 11, paragraphs 1, 2 and 3 of the Moon Agreement:

> "1. The Moon and its natural resources are the common heritage of mankind, which finds its expression in the provisions of this Agreement, in particular in paragraph 5 of this article.
> 2. The Moon is not subject to national appropriation by any claim of sovereignty, by means of use or occupation, or by any other means.
> 3. Neither the surface nor the subsurface of the Moon, nor any part thereof or natural resources in place, shall become property of any State, international intergovernmental or non-governmental organization, national organization or non-governmental entity or of any natural person. The placement of personnel, space vehicles, equipment, facilities, stations and installations on or below the surface of the Moon, including structures connected with its surface or subsurface, shall not create a right of ownership over the surface or the subsurface of the Moon or any areas thereof. The foregoing provisions are without prejudice to the international regime referred to in paragraph 5 of this article".

Therefore, the exploration of the Moon and other celestial bodies is acceptable if it is carried out in accordance with the dispositions of the Moon Agreement.

It should be emphasized that the low number of ratifications and signatures[7] of the Moon Agreement cannot be used as an excuse to avoid its provisions, because the UN General Assembly Resolution 34/68, from 5 December 1979, dully approved this Treaty. The discussions related to the Moon Agreement, which took place in the United Nations Committee on the Peaceful Uses of Outer Space (COPUOS), lasted around 10 years. Such a rich experience and solid debates must to taking into account by the occasion of the discussions related to the international legislation for the exploitation of the Moon and other celestial bodies. However, if the "exploration" of the Moon and other celestial bodies is legally admitted, the same cannot be said about "exploitation", which requires special regulation, as it will be shown in the following topic.

VI. The Need of Setting an International Legislation

It is important to set the difference between the concepts of "exploration" and "exploitation". "Exploration" is defined as the act of traveling to a place or searching a place in order to learn about it. "Exploitation" may be understood as the act of using someone or something for your own purposes and/or profits.[8]

In the scope of the United Nations Treaties on Outer Space, the term "exploitation" first appears in Article 11, paragraph 5, of the Moon Agreement, *in verbis:*

> "5. States Parties to the Agreement hereby undertake to establish an international legal regime, including appropriate procedures, to govern the exploitation of the natural resources of the Moon as such exploitation is about to become feasible. This provision shall be implemented in accordance with article 18 of this Agreement."

Paragraphs 6 and 7 of the mentioned Article 11 of the Moon Agreement present the conditions for the establishment of the referred international legal regime:

> "6. In order to facilitate the establishment of the international regime referred to in paragraph 5 of this article, States Parties shall inform the Secretary-General of the United Nations as well as the public and the international scientific community, to the greatest extent feasible and practicable, of any natural resources they may discover on the Moon.

7 According to COPUOS (document A/AC.105/C.2/2015/CRP.8), on January 1st, 2015, the Moon Agreement had 16 ratifications and 4 signatures.

8 Cambridge Dictionaries Online (http://dictionary.cambridge.org/us/dictionary/english).

7. The main purposes of the international regime to be established shall include:
   (a) The orderly and safe development of the natural resources of the Moon;
   (b) The rational management of those resources;
   (c) The expansion of opportunities in the use of those resources;
   (d) An equitable sharing by all States Parties in the benefits derived from those resources, whereby the interests and needs of developing countries which have contributed either directly to the exploration of the Moon, shall be given special consideration".

Therefore, the exploitation of the Moon and other celestial bodies could only occur after the establishment of an international legislation to regulate that kind of space activity. Article 18 of the Moon Agreement states that:

> "Ten years after the entry into force of this Agreement, the question of the review of the Agreement shall be included in the provisional agenda of the General Assembly of the United Nations in order to consider, in the light of past application of the Agreement, whether it requires revision. However, at any time after the Agreement has been in force for five years, the Secretary-General of the United Nations, as depositary, shall, at the request of one third of the States Parties to the Agreement and with the concurrence of the majority of the States Parties, convene a conference with the States Parties to review this Agreement. A review conference shall also consider the question of the implementation of the provisions of Article 11, paragraph 5, on the basis of the principle referred to in paragraph 1 of that article and taking into account in particular any relevant technological developments".

The Moon Agreement entered into force on 11 July 1984, however it was never updated, as happens with other four United Nations Treaties on Outer Space. Therefore, the international legal regime for the exploitation of the Moon and other celestial bodies is not yet dully established.
Turning to Avatar film, RDA created a *fait accompli*, because it started exploiting Pandora despite the establishment of an international legislation. Therefore, there was no legal support for the activities carried out by RDA in Pandora.

VII. Some Remarks

The opinions and understandings presented in this paper may be summarized as follow:

1. The appropriate State should have given its authorization to RDA had started carrying out activities in Pandora and should take responsibility for these activities, in accordance with Article VI of the Outer Space Treaty;
2. As provided in Article II of the Outer Space Treaty, despite the establishment of a base in Pandora, RDA had no right of ownership or any prop-

erty on that celestial body, unless if there was an international legislation to assure those rights;
3. It would be recommendable that the appropriate State had submitted prior consultation to other States Parties of the Outer Space Treaty, as foreseen in Article IX;
4. In accordance with Article IV of the Outer Space Treaty, RDA could not have established a military base, nor has used and tested any type of weapons, and could not have conducted military manoeuvers in Pandora;
5. The appropriate State infringed the United Nations Declaration on the Granting of Independence to Colonial Countries and Peoples, because it admitted the colonization of Pandora by its national company RDA;
6. RDA could not have exploited unobtanium from Pandora before the establishment of an international legislation to regulate this kind of activity.

Jake Sully, Avatar's film main character, when decided to become a Na'vi warrior, expressed his position about human beings (called "Sky People" in the film):

> "The Sky People have sent us a message [...] that they can take whatever they want. That no one can stop them. Well, we will send them a message. You ride out as fast as the wind can carry you. You tell the other clans to come. Tell them Toruk Macto calls to them! You fly now, with me! My brothers! Sisters! And we will show the Sky People [...] that they cannot take whatever they want! And that this [...] this is our land!"[9]

When reflecting on his experience in Pandora, Jake Sully repeated a line he first said at the beginning of the film where he said he eventually had to wake up from his dreams of flying that he used to have when he first lost the ability to walk. He said: I was a warrior who dreamed he could bring peace. Sooner or later though, you always have to wake up.[10] Jake Sully's words may be applicable to the current scenario of outer space exploration, specifically in the subjects of "militarization of space" and "exploitation of space minerals". Unfortunately, peace has become an utopia and we live under the constant fear of seeing outer space become a battlefield. There are no longer warriors of peace, but, instead, there are many people who advocate the possibility of taking weapons to space as a measure of self-defense. Along centuries, mankind is not giving the due attention to the environment and, nowadays, natural resources are increasingly disappearing. As if that was not enough, we almost depleted the natural resources of the Earth and now we consider the

9 www.imdb.com/title/tt0499549/quotes.
10 http://avatarblog.typepad.com/avatar-blog/2010/05/the-best-avatar-movie-quotes.html.

possibility of exploiting minerals of the Moon and asteroids. Concerning the exploitation of space minerals, the following steps must be observed:

a. all space nations, especially the developed ones, must undertake to reduce the pollution and to preserve the environment;
b. the exploitation of the Moon and other celestial bodies is subjected to the establishment of an international legislation to regulate this kind of activity, or at least, the establishment of an international legal regime, such as the one foreseen in Article 11, paragraph 5, of the Moon Agreement.

Taking into account the current technological development, the authors consider that the five United Nations Treaties on Outer Space must be updated. For this purpose, the role of the United Nations, through its Committee on the Peaceful Uses of Outer Space (COPUOS), must be reinforced. It should be emphasized that the authors have no restrictions on the academic discussions regarding the exploitation of space minerals, as those that are occurring within the framework of The Hague Space Mineral Resources Governance Working Group. However, they consider that the commitment of all space nations, especially the developed ones, to reduce the pollution and to preserve the environment, should come first that any experience of exploiting mineral resources from outer space. Besides, the exploitation of the Moon and other celestial bodies would only be valid after the establishment of an international legislation to regulate this kind of activity, or at least, the establishment of an international legal regime, such as the one foreseen in Article 11, paragraph 5, of the Moon Agreement.

Avatar's film had a happy end, because the majority of RDA's staff was banished from Pandora before that celestial body was destroyed. Only a few researchers were allowed to remain there. If it is true that sometimes life imitates art, let us hope there is still time for Earth!