The Issue of International Legal Regulation of the Exploiting Natural Resources in Outer Spaceon the Basis of International Law

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ABSTRACT
The article analyzes the problem of international legal regulation of the exploiting natural resources in outer space. Special attention is paid to innovative proposals to amend current legislation offered by ague Space Resources Governance Working Group and Space Generation Advisory Council. The need to establish a distinction between the legal regimes of celestial bodies and resources of outer space is emphasized. Arising from the research, a conclusion about the need to update the existing rules of international space law and concretize the concepts such as celestial bodies, space resources, common heritage of mankind and use of outer space is formulated.
Keywords: mining resources in space, celestial bodies, asteroids mining, common heritage of mankind, ownership, commercialization of the space industry, national assignment ownership

As a result of the progressive development of technologies, the prospect of commercial activity in space has turned into a practical plane, transforming the space industry into a profitable area for investment. Compared to 1999, in 2005, the average annual revenue of the global space market increased by 93.3%, in absolute terms, the growth amounted to 168.2 billion US dollars (USD)[96] due to the fact that private companies actively provided services in various areas of the space industry and developed their own commercial projects.

In this connection, over the past decade, the idea of mining on celestial bodies has begun to take the form of national acts of individual States and specific private sector projects. However, what is the main motive for commercial exploration of space resources and global space projects in general?

Firstly, the economic benefits of such activities are obvious, and analysts predict that mining in space can turn into a multibillion-dollar industry. The idea of mining resources on asteroids — asteroid mining — is one of the latest trends in space exploration. Unlike Earth, where heavy metals are concentrated closer to the core, metals on asteroids are dispersed throughout the object[97], which directly facilitates the process of resource extraction.

Moreover, in total, the amount of resources contained in near-Earth asteroids is significantly higher than the average in the Earth's crust, which makes asteroids one of the main candidates in the mining space industry. According to NASA experts, the cost of asteroids can be about 700 quintln US dollars — this amount is approximately equivalent to 95 billion US dollars for each tellurian[98].

Secondly, easily accessible reserves of metals, mineral resources and rare earth elements on Earth are being reduced and depleted. Anticipating the coming crisis of depletion of natural resources, commercial companies offer to expand production beyond the Earth, that is, to extract resources in outer space. It should be noted that classes of celestial bodies are usually divided into three main groups: the C-group contains hydrated minerals (water); the S-group is the basis of the composition — silicates and aluminum; the X-group is rich in metals. It is assumed that the potential targets for the development will be as close to Earth asteroids, which, according to estimates by the Center for the near-earth objects studies (CNEOS) at NASA, at the beginning of 2017 was 17 272[99].

Thirdly, studies show that a class C asteroids contain a large amount of water is a valuable resource to produce rocket fuel, because water can be extracted and subjected to electrolysis to produce hydrogen and oxygen — the key ingredients used in rocket engines.

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96 General trends in the development of space activities [Electronic resource] // Baiterek: information resource. Url: http://bayterek.kz/info/space_activities.php (date of access: 06.01.2021).

97 Mineral resources in space [Electronic resource] // Gold mining: scientific information resource. URL: https://zolotodb.ru/article/10880 (date of access: 06.01.2021).

98 Bank of America report: 700 quintillion dollars from space [Electronic resource] // Habr: information resource. Url: https://habr.com/ru/company/edison/blog/438184/ (date of access: 06.01.2021).

99 Extraction of minerals outside the Earth: will the gold rush begin in space [Electronic resource] // Elements: scientific and journalistic resource. URL: https://elementy.ru/nauchno-populyarnaya_biblioteka/434283/Dostat_zvezdu (date of access: 06.01.2021).

This field can be used as a refueling station, which will significantly reduce fuel costs and launches, as well as reduce the cost of space missions.

Against the background of actively developing projects aimed at extracting resources in space, the question of the legitimacy of such activities is of particular importance. On the one hand, the increasing intentions of States and commercial companies to extract minerals valuable for industry from the bowels of celestial bodies run counter to the established international regime. Since the established principle of "non-appropriation" in the fundamental international act — the Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies, 1967 (hereinafter referred to as the Outer Space Treaty) prohibits States from appropriating, occupying and proclaiming sovereignty over outer space, the Moon and celestial bodies[100]. On the other hand, this restriction allows us to believe that the extraction and subsequent appropriation of resources do not violate this principle, since article II of the Outer Space Treaty considers only outer space, the Moon and celestial bodies, but not the minerals contained in them, which has already been used in a number of countries when developing relevant national laws.

In view of this, the most significant are the adopted legislative acts of the USA, Luxembourg and the UAE, which only actualized the discussion about the validity of such actions.

Of particular interest is the US Commercial Space Launch Competitiveness Actof 2015. It is aimed at developing commercial research and the use of space resources to meet national needs. In particular, chap. IV "Space Resource Exploration and Utilization" contains a provision according to which a US citizen engaged in the commercial acquisition of asteroid resources or space resources is entitled to any asteroid resource or acquired space resource, including the right to possess, own, move, use and sell asteroid resources or space resources extracted in accordance with applicable law, including US international obligations[101].

On April 6, 2020, the Executive Order of the US President "Encouraging International Support for the Recovery and Use of Space Resources" was signed. The order grants U.S. citizens the right to conduct commercial exploration, extraction and exploitation of resources in space in accordance with "applicable law"[102]. The listed legislative acts allow us to believe that the United States unilaterally introduced the right of private ownership of the extracted resources from the bowels of space bodies.

The law on the Exploration and Use of Luxembourg's space Resources — the "Space Law"[103] of July 20, 2017 — unlike the provisions of US acts regulating only the activities of its own citizens, it is established that any foreign company with a representative office in the duchy has the right to participate in the development of resource extraction.

Luxembourg's mission in this regard is to issue a license and then monitor the company's activities.

Following Luxembourg, the United Arab Emirates (hereinafter referred to as the UAE) has formed its own approaches in two key areas of space exploration: exploration and commercialization of space resources. In 2019, the UAE Space Agency took steps to regulate the space sector based on its own legislative framework in order to allow private companies to retain full ownership of the extracted resources. The head of the agency, Mohammed al-Akhbabi, said: This is the same principle as going out into the ocean and disposing of the fish you catch. If you don't own a fish, then why go to the sea?"[104] At the moment, the UAE has adopted Federal Law No.12 on the regulation of the space sector. Article 14 of the Law mentions a ban on the possession of a space object and the implementation of space activities without the appropriate permission from the Agency[105].

The above facts lead to the following set of questions. Is the State authorized to issue permits to individuals and legal entities to extract resources without having ownership rights in respect of these resources and their territories? Who will own the extracted resources? Do private companies have the opportunity to acquire ownership or other property rights to a celestial body or its resources?

For a more detailed consideration of these aspects, it is necessary to consider the status of outer space and celestial bodies.

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100 Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies. Article II [Electronic resource] // UN website. URL: https://www.un.org/ru/documents/decl_conv/conventions/outer_space_governing.shtml (date of access: 20.01.2021).

101 U.S. Commercial Space Launch Competitiveness Act. Title IV. Sec. 51303. P. 129 STAT. 722 [Electronic resource] // USA Congress website. URL: https://www.congress.gov/bill/114th-congress/house-bill/2262 (date date of access: 20.01.2021).

102 Insight — Encouraging the Recovery and Use of Space Resources: Recommendations for Governmental Policies and Engagement [Electronic resource]. URL: https://swfound.org/news/all-news/2020/10/insight-encouraging-the-recovery-and-use-of-spaceresources-recommendations-for-governmental-policies-and-engagement (date date of access: 01/21/2021).

103 Law of 20 July 2017 on the Exploration and Use of Space Resources (Loi du 20 juillet 2017 sur l'exploration et l'utilization des resources de l'espace) // Official Gazette of the Grand Duchy of Luxembourg, No.674 (July 8, 2017), Legilux.

104 UAE Looks to Regulate Asteroid Mining As It Aims to Lure Private Space Sector [Electronic resource] // The National. URL: https://www.thenationalnews.com/uae/science/uae-looks-to-regulate-asteroid-mining-as-it-aims-to-lure-private-space-sector-1.943028 (date of access: 20.01.2021).

105 Federal Law No.12. Chapter 3. Article 14. Issued on 12/19/2019. Corresponding to 22 Rabi 'Al-Akhar 1441H. On the Regulation of the Space Sector [Electronic resource] // Offi cial Gazette, issue No.669. Url: https://www.lexmena.com/lawdiff/en_fed~2019–12–19_00012_2020–02–13%5Een_fed~2019–12–19_00012_2020–02–22/ (date of access: 20.01.2021).

During the development of international space law, the question of the legal status of space and its resources was raised: is outer space res communis[106] or terra nullius[107]? Since the adoption of the Outer Space Treaty of 1967, the doctrine of res communis has prevailed — the concept according to which the sovereignty of no State can extend to the space that is in common use of all peoples. Perhaps a striking example of the concept of terra nullius is the territory of Western Sahara, which was claimed by Morocco and Mauritania after its decolonization by Spain. In 1975 The International Court of Justice of the United Nations ruled that during the Spanish colonization, which began in 1884, Western Sahara was not a territory belonging to one of the two States, even though the territory has a legal connection with Morocco and Mauritania, these ties are not of such a nature that could affect the application of the General Assembly resolution on the decolonization of this territory[108]. That is, through Spain's renunciation of the territory, the status of Western Sahara qualifies as terra nullius. In relation to outer space, the application of this concept is untenable, since outer space has not been and is not subject to anyone's sovereignty and jurisdiction, and the prohibition on establishing sovereignty has been approved by treaty. Here it is appropriate to agree with G. G. Shinkaretskaya that the status of outer space is a special kind of sui generis status: therefore, this space is subject to the unified jurisdiction of all States[109]. Which confirms art . II of the Outer Space Treaty, which assigns outer space as a territory outside the jurisdiction of any State, and no State can exercise any sovereign rights over outer space, the Moon and celestial bodies.

We could do worse than heed to the extremely interesting position of the United States in the previously mentioned Executive Order: "Outerspaceis a legally and physically unique main of human activity, and the United States does not view it as a global commons"[110], which literally means the intention of the United States not to consider space as the common heritage of mankind. According to the provisions of Article I of the Outer Space Treaty, outer space, as well as celestial bodies, cannot belong to a single State, and their use and exploration is the property of all mankind[111]. At the same time, the mentioned US laws declare commitment to the current legal regulation. It follows that by allowing commercial production, the United States violates the same provision to which they refer. Along with this, it should be noted that Article I of the Outer Space Treaty does not qualify outer space as the property of all mankind,

but considers its use and exploration to be a common property. In other words, the result obtained through the use and exploration of outer space is the property of all mankind. However, there is no clarity as to what is meant by "use" and whether this concept includes the extraction of resources in accordance with current legislation.

Analyzing the provisions of Article I of the Outer Space Treaty, some Western experts come to the conclusion[112] that the concept of "use" is similar in meaning to the concept of "exploitation". They argue this point of view by the fact that in the legal sense, the word "use" means the use of property in order to make a profit as a result of the exploitation of this property. However, the Moon and other celestial bodies cannot be attributed to immovable property and transferred to ownership — these are objects that cannot fall into the sphere of civil circulation at all (it is hardly appropriate to talk about withdrawal from civil circulation here)[113]. A special international legal regime established by States applies to outer space, as well as celestial bodies and their resources.

In addition to the Outer Space Treaty, such issues are regulated in the 1979 Moon Agreement, where article 11, paragraph 1, explicitly states that the Moon and its natural resources are the common heritage of mankind. Moreover, in the same Article 11, paragraph 3 contains a clear prohibition on the ownership of the surface and bowels of the Moon, its sites and natural resources[114]. Thus, it can be said with sufficient certainty that the provisions of article 11 of the Moon Agreement could be used in understanding the provisions of the Outer Space Treaty. However, as of April 8, 2020only thirteen states have signed and ratified the treaty, they do not include such major space powers as Russia and the United States. In this regard,

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106 Everybody's territory.

107 Nobody's territory.

108 Mark, A. A. Smith, Jr. Sovereignty Over Unoccupied Territories — the Western Sahara Decision, 9 Case W. Res. J. Int'l L. 135 [Electronic resource] // Case Western Reserve Journal of International Law. 1977. URL: https://scholarlycommons.law.case.edu/jil/vol9/iss1/8 (accessed date: 20.01.2021).

109 See: Shinkaretskaia, G. G. International Space Law and Juridical Persons // Proceedings of the Institute of State and Law of the RAS. 2019.Vol. 15.No.1.P. 59–80.

110 Insight — Encouraging the Recovery and Use of Space Resources: Recommendations for Governmental Policies and Engagement [Electronic resource]. URL: https://swfound.org/news/all-news/2020/10/insight-encouraging-the-recovery-and-use-of-spaceresources-recommendations-for-governmental-policies-and-engagement (date of access: 20.01.2021).

111 Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies. Article I [Electronic resource] // UN website. URL: https://www.un.org/ru/documents/decl_conv/conventions/outer_space_governing.shtml (date of access: 20.01.2021).

112 See: Su J. Legality of Unilateral Exploitation of Space Resources under International Law. [Electronic resource] // International and Comparative Law Quarterly, 66 (4), 991–1008. 2017. doi: 10.1017/S0020589317000367. URL: https://www.cambridge.org/core/journals/international-and-comparative-law-quarterly/article/abs/legality-of-unilateral-exploitation-of-space-resources-under-international-law/EE17641F7B7C6404A79B77AEB627D5F4 (date of access: 19.03.2021).

113 Verbitskaya Yu. O. Space objects as objects of civil turnover // Objects of civil turnover: a collection of articles/ Executive editor M.A. Rozhkova. M.: Statut, 2007.P. 466.

114 Agreement on the Activities of States on the Moon and Other Celestial Bodies, adopted by General Assam resolution 34/68 UN bleys of December 5, 1979, entered into force on July 11, 1984 [Electronic resource] // UN website. URL: https://www.un.org/ru/documents/decl_conv/conventions/moon_agreement.shtml (date of access: 20.01.2021).

in 2018, at the 57th session of the UN Space Committee, the opinion was expressed that there is no uniform understanding of the two principles according to which, firstly, the exploration and use of outer space are the property of all mankind, as defined in the Outer Space Treaty, and, secondly, the Moon and its natural resources are the common heritage of mankind, as defined in the Moon Agreement[115]. According to the delegation that expressed this view, these concepts require in-depth discussion in the Legal Subcommittee to ensure their uniform interpretation.

It should be noted that since 2017, the UN Committee on the Peaceful Uses of Outer Space and its Legal Subcommittee have officially included the item "General Exchange of Views on possible models of legal regulation of activities for the exploration, development and use of space resources" in the official agenda. However, in comparison with the specialized agencies of the United Nations, the Hague International Working Group on Space Resources Management managed to take the most in-depth look at the current situation in space activities and develop its own regulatory model on this basis. The organization, which includes representatives of governments, industry, space agencies and scientists from around the world, was established in 2016 with the support of the Dutch Foreign Ministry. The main activity of the working group is based on the identification and development of "building blocks" — elements representing potential solutions to the future regime of regulation of space activities. On November 12, 2019, the Working Group published the final text of the Main Provisions for the Development of a Legal Regime for Mining Activities in Space (Building Blocks for the Development of an International Frame work on Space Resource Activities). As indicated in the preamble, the document does not regulate the detailed activities of States, but fixes the general principles of the future regulation of space activities, which will take into account the principle of "adaptive management" — gradual management as scientific and technological progress[116].

The main provisions of the document that are worth paying attention to:

- A rule is introduced on holding an international consultation before starting potential activities in outer space with reference to Article IX of the 1967 Outer Space Treaty, if there are grounds to believe that such activities are harmful (Article 4);
- States are responsible for non-governmental organizations engaged in mining activities; if the activity is carried out by an international organization, both the organization itself and the participating States are responsible (Article 5);
- States exercise jurisdiction and control over extracted resources (Article 6);
- Resource rights in respect of raw minerals and volatile materials extracted from space resources, as well as products derived from them, can be legally acquired through domestic legislation, bilateral agreements and/or multilateral agreements (Article 8);
- Resolution of potential disputes related to mining activities should be carried out through judicial, non-judicial or mixed mechanisms in accordance with the Optional Arbitration Rules of the Permanent Court of Arbitration for the Settlement of Disputes Related to Activities in Outer Space, dated December 6, 2011 (Article 9).

Of particular interest in the context of the proposed document is the regulation of the position of legal entities. The proposed principle is similar to the norms prescribed in the 1982 UN Convention on the Law of the Sea. An example is the following case. May 6, 2010 The International Seabed Authority has appealed to the Chamber of Disputes to issue an advisory opinion on the obligations[117] and duties of States that have vouched for individuals and legal entities in the Area. A "region" is a zone established by the UN Convention on the Law of the Sea, which represents the bottom of the seas and oceans and its subsoil beyond the limits of national jurisdiction. Such a zone and its resources are declared the common heritage of mankind. On February 1, 2011, the following decision was made. First, States have a direct obligation, for example, the obligation to apply the precautionary principle. According to the conclusion, non-compliance by legal entities and individuals with their obligations does not give rise to the responsibility of the sponsoring State. It arises only if a State fails to comply with its obligations under the Convention and thereby causes damage. That is, it is necessary to establish a causal relationship between non-fulfillment of obligations and damage. Secondly, the Convention requires the sponsoring State to adopt, within the framework of its national legislation, rules and administrative measures that are designed to ensure that legal entities and individuals comply with their obligations and release the sponsoring State from responsibility. Thus, the responsibility for the activities of legal entities and individuals should be borne by the State. This provision is also confirmed in article VI of the Outer Space Treaty: "The activities of non-governmental legal entities in outer space, including the Moon and other celestial bodies, must be carried out with the permission and under the constant supervision of the relevant State party to the Treaty"[118].

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115 Report of the Legal Subcommittee on Its Fifty-Seventh Session, Held in Vienna from 9 to 20 April 2018. IV. Status and Application of the Five United Nations Treaties on Outer Space [Electronic resource] // United Nations A/AC.105/1177. P. 11–13. URL: https://www.unoosa.org/oosa/oosadoc/data/documents/2018/aac.105/aac.1051177_0.html (date of access: 19.03.01.2021).

116 See: Popova, S. M. The Hague Model of Legal Regulation of Activities in the Field of Space Resources and Prospects for the Transformation of International Space Law // Space Research. 2018. No.2. P. 144–158.

117 Abashidze, A. S., Solntsev, A. M., Syunyaeva, M. D. Advisory Opinion of the International Tribunal for the Law of the Sea on the Responsibility of States for Activities on the Seabed Beyond the Limits of National Jurisdiction // State and Law. 2012. No.7. P. 72–81.

118 Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies. Article VI [Electronic resource] // UN website. URL: https://www.un.org/ru/documents/decl_conv/conventions/outer_space_governing.shtml (date of access: 20.01.2021).

The provision of clause 11.3, which directly concerns the creation of "safety zones", is of interest. Considering the principle of non-appropriation, according to article II of the Outer Space Treaty, States and international organizations have the right to establish security zones in the area designated for the extraction of space resources, as this is necessary to limit harmful effects and prevent interference. A State or an international organization may restrict access for a certain period if there is a notification sent stating the reasons for such a restriction. However, it is indicated that the creation of "safety zones" should not prevent free access in accordance with international law to any area of outer space for personnel, vehicles and equipment of another operator. It is noteworthy that the Main Provision of the working group contains its own terminology, in which the "operator" is a State, international or non-governmental organization engaged in activities in the field of space resources. There is not enough concretization here, since only a State is a subject of international space law, while international and non-governmental organizations are not.

Moreover, the concept of "space resource" is also defined. The document contains the wording: a space resource is a recoverable and/or recoverable abiotic resource in outer space. According to the working group's understanding, this includes mineral and volatile materials, including water, but excludes: (a) satellite orbits, (b) radio-electronic spectrum and (c) solar energy, except when it is collected from unique and rare places. In this regard, it should be noted that there is no more detailed qualification for natural resources, which can be: inexhaustible, exhaustible, renewable, non-renewable. For example, at the EPSC Planetary Science conference in Riga in 2017, a group of thirty astronomers announced the possibility of mining only after specialists begin to understand the behavior of small celestial bodies through a comprehensive study, as a result of which they will compile a list of relatively slow objects where probes can reach[119].

It is necessary to specify the legal definition of a celestial body. According to S. P. Malkov, when defining the legal concept, it is necessary to distinguish between celestial bodies and natural resources of space and introduce separate legal regimes for these objects. It seems that the legal regime of celestial bodies is inseparable from the legal regime of the resources of celestial bodies. In turn, a different regime will apply to the natural resources of outer space. Thus, the highlighted definition of the legal concept of a celestial body will not include small asteroids that do not have sufficient gravity, small satellites of planets, as well as meteor bodies, comets, which must be attributed to the natural resources of outer space[120].

At the 57th session of the UN Space Committee, the opinion was expressed that the format of the work of this working group is of concern, since the fundamental principles of interest to all States were discussed by a limited group of individuals. It was pointed out that the wording in the preliminary draft submitted by the group in 2017 was similar to certain provisions of recent national acts on the extraction of space resources. The Delegation further noted that the working group had not considered the practice-oriented results of the work of the Scientific and Technical Subcommittee (for example, on the topic of ensuring long-term sustainability of activities). The inspirers and participants of the Hague Working Group should consider the existing criticism of it, so as not to repeat the example of the 1979 Moon Agreement mentioned earlier, which is so actively ignored by the group itself[121].

It is important to note that Greece and Belgium proposed the creation of a working group to develop alternative legal solutions necessary to ensure the legal certainty of the development of space resources at the 58th session of the Legal Subcommittee of the UN Committee on Outer Space in 2019. Belgium presented a preliminary list of issues indicating the need to define terms and the application of general principles of space exploration; institutional framework for resource management, etc[122]. Separately, at the initiative of the States, attention is focused on the already existing Agreement on the Moon. The principles formulated in paragraph 7 of Article 11 of the Agreement, in the opinion of the delegation, are fundamental, regardless of opinions on the ratification of this Agreement. Judging by the analysis of the draft report of the 58th session of the legal subcommittee, the subcommittee has scheduled informal consultations with the aim of a broad exchange of views and discussion on the establishment of a working group proposed by Belgium and Greece. Thus, the creation of a separate group on the development of space resources in the foreseeable future seems quite possible. It is necessary to discuss such issues precisely at the level of the legal subcommittee in order to consider the opinion of all parties.

Along with the approaches proposed by the Hague Working Group, it is necessary to note the proposals of the Space Generation Advisory Council (hereinafter referred to as SGAC). This non-governmental organization also considers it necessary to create an international regulatory framework regulating the extraction of resources in space. In a concentrated form, the proposals boil down to the following: the introduction of a fee for the lease of a site on an asteroid, a time limit on the lease and the creation of a space customs office, whose competence will include the inventory of materials returned to Earth[123]. To gain access to the "resource mine", the parties will be required to sign a lease agreement with an intermediary

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119 Scientists told what interferes with the extraction of minerals on asteroids [Electronic resource] // RIA Novosti. September 20th. 2017. URL: https://ria.ru/20170920/1505147158.html (date of access: 19.03.2021).

120 Malkov, S. P. International Space Law: Training Manual. SPb.: SPbGUAP, 2002.P. 112.

121 Timokhin, K. V. The Hague Space Resources Governance Working Group as an Example of the General Approach to the Development of the International Space Law // Space Research. 2019. No.1. P. 45–55.

122 See: Alekseev, M. A. Prospects for the Coordination of the International Legal Regime of Natural Resources of Celestial Bodies // Space Research. 2019. No.1. P. 56–66.

123 See: Cheney Th. Space Resources At the UN [Electronic resource] // Thomas 'blog 2019.9 April. URL: https://thomascheneyblog.wordpress.com/2019/04/09/space-resources-at-the-un/ (date of access: 21.01.2021).

organization. SGAC notes the need to pay special attention to countries that do not have space technology, and that measures should be taken that will benefit them, such as assistance in financing their space programs or sharing resources obtained from space. The provisions proposed by the Council need to be defined and refined in more detail. For example, the article does not specify how resources will be shared with lagging countries.

Thus, the analysis of studies devoted to the development of the problem of legal regulation of the extraction of space resources allows us to draw the following conclusions.

Firstly, as it was noted earlier, outer space is under the joint jurisdiction of all States. Consequently, issues such as the legality of the extraction of space resources and property rights in relation to these resources should be resolved at the interstate level "on the basis of equality and in accordance with international law"[124]. In turn, the adopted legislative acts of the USA, Luxembourg and the UAE, to a certain extent interpret their own understanding of the rules of space exploration, which is due to the lack of a uniform interpretation of Article I and II of the Outer Space Treaty. The question of whether such unilateral initiatives of individual States are legitimate should be transformed into a separate item and included in the official agenda at the annual session of the UN Committee on the Peaceful Uses of Outer Space and its Legal Subcommittee.

Secondly, even though most experts consider the national acts of the USA, Luxembourg and the UAE to violate the current legislation, the very fact of the emergence of such legal precedents[125] suggests the need to modernize existing norms of international space law. The legal regime of outer space bears a concrete historical imprint of that time, since during its development, the extraction of resources in space seemed a distant prospect. The ambiguous interpretation of the articles of the Outer Space Treaty, the lack of full and clear regulation of the space activities of private companies indicates an insufficiently stable legal system that is unable to withstand the challenges of the 21st century, such as the potential extraction of space resources, the commercialization of outer space and the increasing role of the private sector in space exploration. The first step in the process of modernization of the legal regime is the concretization in space law of concepts such as: a celestial body, space resources, the common heritage of mankind and the use of outer space. Next, it is necessary to develop a uniform concept of interpretation of Article I and II of the Outer Space Treaty, while considering the provisions of Article 11 of the Moon Agreement, which can be used in understanding the principle of "non-appropriation" in the designated articles.

Thirdly, the extraction of resources is impossible without the location of the subject on the surface of a celestial body, therefore, the creation of "security zones" should be limited in time and territory. Considering the SGAC's proposal for a paid lease of a site on a celestial body, states should discuss such a prospect of creating an international fund, the main financing of which will come from funds received from such a lease. The fund's work can be aimed at monitoring and supporting the environmental situation in outer space or at assisting States that are just beginning to develop their own space sector.

Fourth, in order to eliminate the legal uncertainty of resource extraction, it is necessary to establish certain criteria regarding the rules of resource extraction: 1) to distinguish the concepts of a celestial body and its resources and the resources of outer space; 2) to establish a requirement to extract the maximum permissible mass of resources from a celestial body from the total mass, thereby prohibiting mining on celestial bodies whose mass is below the minimum established; 3) to establish a rule for processing a certain part of resources on the spot so that the bulk of the resources remain inside the celestial body.

Thus, the extraction and exploitation of minerals in space is a progressive phenomenon that requires regulation. It is necessary to establish an international legal regime for the extraction of resources in space before the emergence of numerous international conflicts and disputes. In addition to the above proposals, it seems important to submit to the UN General Assembly a draft resolution on measures for transparency of space activities and expansion of cooperation. The ancient Roman saying "Quod omnes tangit ab omnibus Approbari debet" — "What concerns everyone must be approved by everyone" — acquires special significance in the context of this issue.

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