

Space Doctrine and Guidelines for Long-Term Sustainability of Outer Space Activities as Basis for Sustainable Earth Development

Larysa Soroka

Doctor of Law, Associate Professor, Scientific Institute of Public Law (Kyiv, Ukraine)

E-mail: lsoroka_kw@ukr.net

<https://orcid.org/0000-0002-6979-6049>

Soroka, Larysa (2020) Space Doctrine and Guidelines for Long-Term Sustainability of Outer Space Activities as Basis for Sustainable Earth Development. *Philosophy and Cosmology*, Volume 25, 43-56. <https://doi.org/10.29202/phil-cosm/25/4>

The need for the development and adoption of outer space doctrine is becoming more and more evident. Daily space operations are conducted in a doctrinal void, and this void makes it difficult to predict how well-regulated space activities will be in current conditions and how sustainable it will be. Moreover, the tragic events of the present (pandemic outbreak) have shown that the world, despite all its adaptability, is not ready for such a scenario. Therefore, the issue of sustainability of all systems is relevant. The sustainability of outer space activities is no exception. Long-term sustainable space activities require a common approach to policy, theory and doctrine. This article describes how to achieve this balance. In spite of novelty of the processes described in this paper, they will be useful for establishing ideas on policy, theory, and doctrine in order to enable a coherent strategy for the development of space activities.

Keywords: doctrine, military doctrine, outer space doctrine, outer space activities, sustainability, international principles, guidelines, space commercialization, sustainable development

Received: 25 April 2020 / Accepted: 23 May 2020 / Published: 3 October 2020

Introduction

The world is no longer bipolar, but rather multipolar, since many States and non-public actors are actively involved in space activities; competing interests have become more diverse (Jakhu et al., 2017). States have become less willing to obey the new international binding standards. As a result, the United Nations and its specialized agencies have been unsuccessful in negotiating new space treaties. Instead, the number of mandatory soft law provisions has increased, as well as the number of entities involved in their creation, sometimes in parallel and sometimes controversially.

Space laws, enacted at an earlier stage, focused more on the public side of space activities, which were mainly regulated by the UN through UNCOPUOS. The rapid development of space commercialization has led to a decentralization of space law. First, the UN is no longer the only platform for the adoption of space laws; other international organizations become involved increasingly in the legislative process. Second, the legislation takes the form of both hard and soft law. Finally, international space law is actively supported and supplemented by national space law (Zhao, 2018). This contributes to the conclusion that space law acquires new features. That is, the meta-law derives from a complex branch of law (Ursul, 2013).

It is clear that since the adoption of the first acts, space legislation has been gradually updated, as evidenced by the presence of relatively modern international instruments. However, most contemporary issues are still outside the scope of international space law, as it falls outside its scope. Therefore, the regulatory framework for international space law needs updating, as it no longer controls the dynamics of space activities.

The rapid development of technologies and the transience of processes occurring in space markets require clear and consistent steps based on real opportunities and understanding of their priorities. Although today the private sector in the field of space activities is filling some technological gaps, using the concept of an unconventional approach to risk in order to achieve low cost of space products and services, taking into account the needs of consumers. But the sphere of space activities can achieve sustainable development only by institutionalizing space programs through the creation of a cost-effective strategic roadmap. This space doctrine should take into account, in addition to supply and demand, the security factor, innovation, inclusiveness, international cooperation and environmental friendliness.

Sustainable development of space activities: features of genesis

At the present stage, the key missions of the legal regulation of space activities are security in the military aspect, the safety of people and the environment, and sustainability in the use of outer space in the long run. All three tasks are interrelated and complementary (Hitchens, 2017). Therefore, sustainability, or lack thereof, is a complex and dynamic feature of communities and regions. It is both a process and an outcome that requires to: anticipate threats, reduce vulnerability, mobilize resources and assets, and plan for a better future.

Discussions about the balance between security factors, economic development, and international environmental protection, which began in the 1970s, had not attracted much attention, until 1987, when the concept of sustainable development was first used in the well-known Brundtland Report. It stated that this development should meet the needs of the present, with due regard for the needs of future generations, and further defined that sustainable development is a development that meets the needs of the present without compromising the ability of future generations to meet their own needs (Report, 1987: 41).

Since then, the concept of sustainable development has appeared in various international documents (Report, 1992), in the scientific literature (Lélé, 1991) from different perspectives, and has even been recognized as a general principle in the 1990s in the EU (Agreement, 1994). The global spread of sustainable development, combined with adverse changes in the space environment in the 1990s, has also attracted the attention of space scientists and practitioners (Mikesell, 1994) of the space community. Several issues required to be addressed immediately: the use of outer space for military purposes, the reduction of space debris, space traffic management, long-term exploration and exploitation of outer space, space weather, nuclear pollution, and radio frequency interference. Moreover, these challenges were more or less related to each other, but no optimal mechanism was developed to address them.

Therefore, the development of a more sustainable, innovative, and inclusive concept covering and addressing all of the above issues is required.

Therefore, the Long-Term Sustainability of Outer Space Activities (A/AC.105/L317, 2019) project has been included in the agenda of the UN Committee on Space since 2010. It includes four expert groups, established to address the following topics: Subgroup A “Sustainable Space Utilization supporting Sustainable Development on Earth,” Subgroup B “Space Debris, Space Operations and Tools to support Collaborative Space Situational Awareness,” Subgroup C “Space Weather,” Subgroup D “Regulatory Regimes and Guidance for Actors In the Space Arena” (Long-term, 2019).

In September 2015, the UN adopted a landmark 2030 Development Agenda, outlining Roadmap for Sustainable Development of World Society of 17 Sustainable Development Goals (SDG) to be achieved by each country by 2030 (17 Goals). These goals are an extension of the Millennium Development Goals (MDG) (Millennium, 2000) and continue to address poverty in the world and include a set of unique tools that will help address the challenges of protecting the planet from negative impacts, equal access to resources, meeting a range of social needs, etc.

In order to implement the SDGs in space activities, a Working Group on Long-Term Sustainability of Outer Space Activities was established at the UN, which executed the first arrangements for the twelve Draft Guidelines for Long-Term Sustainability of Outer Space Activities, announced at the Committee on the Peaceful Uses of Outer Space Fifty-ninth session in 2016 (A/71/20, 2016). At the session, the representatives of the countries reaffirmed their commitment to the principles previously adopted for the exploration and use of outer space for peaceful purposes and stressed their importance (A/71/20, 2016). Some delegations stated that transparency and confidence-building measures could make an important contribution to improving the security, reliability, and sustainability of outer space activities. To strengthen international cooperation in space, to establish standards of responsible behaviour across the entire spectrum of space activities, to commit to the principle of non-interference with peaceful exploration and use of outer space, to promote equitable access to outer space, and to enhance the transparency of outer space activities, it would be accurate to develop a renewed treaty on space that is to be negotiated within the United Nations (A/71/20, 2016; Long-term, 2019).

Notwithstanding the statements mentioned above by most countries, only twelve principles have been agreed upon. Others are still under negotiation. For example, the preamble and nine other principles were agreed in 2018 at the fifty-fifth session of the Scientific and Technical Subcommittee of the Committee on Peaceful Uses of Outer Space (A/AC.105/C.1/L.348, 2016). As with all international principles, the application of the Guidelines for Long-Term Sustainability of Space Activities is voluntary. It is hoped that States understand the importance of principles accepted for present and future generations that are the framework for a renewed space doctrine (Long-term, 2019).

As of early 2020, Part A of the Guidelines for the Long-Term Sustainability of Space Activities contained pre-agreed texts of 21 principles, and Part B included seven Guidelines. Others are still under discussion. The analysis of principles’ harmonization reveals that most of the discussions have arisen on issues related to the legislative regulation of a set of key aspects of space operations security. About the safe conduct of operations for the active removal or destruction of space objects in an emergency, with regard to a number of other precautions and self-restraints that States should, in good faith, use in the interests of operational security in space. That is because the unique nature of the space environment

means that the outer space activities of any participant easily influences the activities of others. For example, space debris, regardless of its country of origin, poses a serious threat to safe operation for each space object produced and launched or planned to be launched into outer space. Therefore, a number of issues to prevent and eliminate it would be successful provided cooperation and coordination between all space entities. In addition, outer space is a public domain that is accessible to everyone and therefore requires harmonization of rules to eliminate potential collisions due to the increasing number of satellites. In this regard, the UN should adopt rules to coordinate the space activities of its member countries.

Moreover, it should be noted that “sustainability” must include not only the technical component but also the political will (Sokiran, 2019). In other words, not only a technical capability to explore and use outer space in the long run, but also a political readiness to do so is required. In this respect, the Guidelines for Long-Term Sustainability of Outer Space are a concept that includes the five legal elements of sustainable development: the principle of equality, non-wasteful use, equality between generations, integration (cooperation) and peaceful exploration of outer space, all of them closely interconnected with existing international principles of space activities. ,

At the UNISPACE+50 International Conference (A/RES/73/6, 2018), the Committee on Peaceful Use of Outer Space identified seven thematic priorities in the use of space technologies for sustainable development, such as a global partnership in space exploration and innovation; regulation of the legal regime of outer space and global space governance; enhanced information exchange on space objects and events; international framework for space weather services; strengthened space cooperation for global health; international cooperation towards low-emission and resilient societies; capacity building for the 21st century (Hedman, 2019).

Next year, at the sixty-second session in Vienna of 12-21 June 2019, the strategic document was adopted, the Zero Draft of the “Space-2030,” and the plan for its implementation. UNOOSA presented this document as a comprehensive and promising strategy aimed at consolidating and enhancing the contribution of space activities and space technologies to the implementation of global programs and addressing the long-term sustainable development for the benefit of all mankind (A/AC.105/L317, 2019). Therefore, ensuring the long-term sustainability of space activities requires efforts at national, regional and global levels. That is, efforts by regional intergovernmental organizations can be one of the three main ways of strengthening by the regional level, thus complementing national and global efforts. Indeed, cooperation at the regional level seems to be more effective in practice than at the global level, since there are often fewer conflicts of interest, such as geopolitical, cultural, or economic ones.

Therefore, guidelines are voluntary rules, not binding laws. However, somehow their implementation may be an ideal way of solving complex problems associated with space activities. Since no international agreement has been concluded to address these issues at present, and the adoption of a treaty that would suit all parties requires a lengthy stakeholder discussion. In this regard, the bottom-to-top development of national space doctrines on the basis of the Guidelines for the Long-Term Sustainability of Outer Space Activities can help create a sustainable international space doctrine and adopt a new Space Convention, to be signed by most countries, ideally by all.

Categorical and conceptual interpretation of space doctrine in the discourse of scientific knowledge

A new doctrine in science derives from original ideas to solve certain problems of law and State, which originates from the formation of the relevant theory or teaching. Therefore, evidently developing a new doctrine requires to use the doctrinal provisions of the philosophy of law first. According to Sergey Maksymov, the analysis of legal doctrine as a special way of understanding and existence of the law, which has special ontological and epistemological foundations, methodological means, philosophical and legal substantiation and a special place in the structure of legal reality (i.e. both law and the levels of its reflection, such as the branch of legal science, theory of law and philosophy of law) (Maksymov, 2013) enables to rethink the legal doctrine and the formation of its meta-theory (Patsurkivskiy & Savkina, 2017).

An important component of a legal doctrine is its assessment and prognostic element, which contains programmatic provisions of a recommendation-oriented nature and is the result of a critical analysis of the practice of State and law-making. Mark Van Hoecke and François Ost studied this issue specifically, in particular, the interrelation between systematization, interpretation of law and legal doctrine. From his perspective, systematization provides for and includes the interpretation of legal prescriptions, principles, concepts, legal constructs, etc. that are systematized. However, interpretation is impossible without a certain conceptual basis, which is, at the same time, a necessary basis for any legal rule, as well as legal argumentation. This basis is formed by legal doctrine (Van Hoecke & Ost, 1998: 197; Semenikhin, 2016: 28).

Some scholars argue that the key objective of legal doctrine is to provide a theoretical framework for new ideas and concepts, strategies that do not require fixation in any document (Puzikov, 2013). However, the fundamental value of legal doctrine is precisely in its practical application to society, since it is oriented to the solution of practical problems in law, that is, it is of practically significant nature (Semenikhin, 2016). In addition to the fact that legal doctrine is a system of theoretical and science-based provisions of law that have a compelling force and applicability (Emelin, 2015: 11), the State should legitimate it, as a source of law, in the form of a legal regulation.

An attempt to regulate legal public relations through the creation and adoption of relevant branch doctrine is not sustainable. However, over the last five years, the place and role of doctrinal regulations have been reconsidered to shape Ukraine's long-term and sustainable policy in various areas. Since the declaration of Ukraine's independence, the following doctrines have been adopted: Military Doctrine of Ukraine (Military, 2004), expired, updated doctrine being developed (Military, 2015); National Doctrine of Education Development (National, 2002); National Doctrine of Physical Culture and Sports Development (National, 2004); Doctrine of Information Security of Ukraine (Doctrine, 2017); Military Medical Doctrine of Ukraine (Military, 2018); Maritime Doctrine of Ukraine up to 2035 (Maritime, 2009).

All Doctrines are the source of law. They are sanctioned by the State, designed to regulate the most important social relations (security, education, public health, etc.), provide strategies for resolving these fields and relations in the context of their long-term sustainable development, are always established by the highest authorities, mostly by Presidential Decrees, the latter (Military Medical Doctrine of Ukraine and Maritime Doctrine of Ukraine up to 2035) by Resolutions of the Cabinet of Ministers of Ukraine.

Moreover, the legal doctrine is considered from the perspective of its grouping into scientific, legal doctrine, and public regulatory doctrines. For example, according to Elizabeth Yevhrafova, such grouping will give a more accurate and clear understanding, since scientific, legal doctrine is not necessarily predetermined by the nature of the political and legal culture of society, but it is an autonomous, self-contained phenomenon, action and influence thereof are not limited by the time and boundaries of national States (Yevhrafova, 2013: 54). In turn, regulatory doctrines must be based on the achievements of law study in general and scientific legal doctrine, in particular.

We advocate that the doctrines should be science-based. For this purpose, well-known experts, both of law and of other fields, are invited. An example of such cooperation is the development of the study “UKRAINE 2030: Doctrine of Balanced Development” (UKRAINE, 2017), the developers of which were different specialists.

Therefore, the legal doctrine is a set of ideas, concepts, principles, development vectors of a specific socially significant legal phenomenon or process, organized into a coherent structure that meets the requirements of the present, that provides prospects for further improvement and the basis (in the case of its legislative consolidation) for the regulation of a range of relevant social relations. Consequently, the phenomenon under analysis is of a dual legal nature: first, the purely theoretical property of legal science, objectified in the form of its specific area; second, a full-fledged source of law, designed properly.

It should be noted that the analysis of the world scientific opinion on the space doctrine and its application in practice reveals that practically all existing scientific developments on this issue have been related to military or defense purposes. For example, Space Doctrine for the 21st century, a research paper developed by Robert D. Newberry for graduates of the Research Department of the US Air Command and Staff College, states that the doctrine includes the tenets of space power, the operational art of space warfare, and implementation strategies for space forces (Newberry, 1997). In his paper, he used the works of other researchers in the field of military doctrine, such as Robert Frank Futrell (Futrell, 1971), Barry R. Posen (Posen, 1984), David E. Lupton (Lupton, 1988). All of them viewed “military doctrine” as part of a grand strategy directly related to military means.

Therefore, all studies of space doctrine were conducted with a focus on its military purpose, without considering its importance for the sustainable inclusive and innovative development of space activities. The combination of both areas (military and civil) is reasonable for updating space doctrine.

The legal nature of space activities as the basis of space doctrine

To uncover the specificities of space doctrine, the essence of its basic element, space activities, should be explained. In addition to the term “space activities,” other words and phrases are often used, in particular, “space sphere,” “space industry,” “space industry,” “rocket and space industry,” “cosmonautics,” “public space activities,” “national space activities,” “space exploration,” “cosmisation of law,” which require a doctrinal interpretation in order to further consolidate them in legal regulations. They should not only fulfill their basic purpose, promote the unambiguous interpretation of international legal norms, establish clear limits of application of these norms, but also meet the realities of today, facilitate the formation and implementation of a conceptual apparatus for a unified approach to understanding the problems being solved at the international level, in the development and further improvement of the international legal regulators of this market (Biehlly, 2000). In this study, the etymology and interpretation of all these phrases

are not discussed. Instead, the terms “the sphere of space activities” and “space activities” are used as equivalent.

Accordingly, the logical question is, what is an activity? In general, activity is considered to be a specifically human form of relation to the outside world, the content of which is the expedient changes and transformations of things and phenomena depending on human needs (Pryshchak & Matsko, 2011). Human activity is always social, conscious, active, and manifests itself in a system of expedient actions aimed at achieving the goal (Varii, 2007).

In international documents, *kosmichna diialnist* (in Ukrainian) is translated as “space activities” (A/68/189, 2013), that is, activity implies activeness. Human activeness is the source of its development, determines its activity, being its driving force (Bazaluk & Balinchenko, 2020). The fundamental difference between these concepts is that activity comes from the need for the object, and the activeness comes from the need for activity. In addition, activeness seems to precede activity in time: before the activity starts, we actively choose what is desirable, freely plan, think, by what means to achieve something. Nevertheless, the activeness not only precedes activity, but also “accompanies” it throughout the process. Optimal activity devoid of activeness cannot be imagined (Varii, 2007). Therefore, activeness is an element of the activity.

For the first time, the phrase “space activities” appears in the UN General Assembly Resolution 2221 (XXI, 19 December 1966) “... the recommendation of the Committee on the Peaceful Uses of Outer Space that the objectives of the Conference shall be to examine the practical benefits of space programs on the basis of scientific and technical achievements, and the opportunities available to non-space Powers for international cooperation in space activities, with special reference to the needs of developing countries” (A/RES/2221, 1966). That is, according to the document notes, the concept of “space activities” is related to the term “use,” but not identified.

Further, Article III of the Treaty on the Principles of the Activities of States for the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies (adopted by General Assembly Resolution 2222 (XXI) of 19 December 1966) states that space activities are activities in the exploration and use of outer space, including the Moon and other celestial bodies (A/RES/2222, 1966). Space activities should be carried out in accordance with international law, including the UN Charter, in the interests of maintaining international peace and security, promoting international cooperation and understanding. Furthermore, Article IX of the Treaty states that “in the exploration and use of outer space, including the Moon and other celestial bodies, States Parties to the Treaty shall be guided by the principle of cooperation and mutual assistance and shall conduct all their activities in outer space, including the Moon and other celestial bodies, with due regard to the corresponding interests of all other States Parties to the Treaty” (A/RES/2222, 1966).

Specifically, space exploration and use activities are the basis of space activities and their structural elements.

Some authors argue that the terms “outer space activities” and “outer space exploration and use” should be used as equivalent. This approach is used especially to avoid repeating the established expression of space law, such as “exploration and use of outer space” (Stelmakh, 2016).

For example, Olga Stelmakh in his thesis equates the concept of “exploration and use of outer space” with “space activities,” arguing that in a certain context (when differentiating basic concepts is not of fundamental importance) the concept of “space security” is used to identify “the security of the exploration and use of outer space” (“the security of space

activities”). Furthermore, the author states that the concept of space security covers, but is not limited to, the concept of space activity security (the security of exploration and use of outer space). The security of space exploration and use considers the same processes, but mostly in terms of the mutual impact of space activities on the outer space and the threat of outer space on anthropogenic activities carried out in outer space. Therefore, the focus is on the exploration and use of outer space as a basic element, which differentiates the concept of “space activity security,” among other components of “space security” (Stelmakh, 2016).

Doctor of Law, Professor Nadiya Armash also advocates this perspective in determining that international space law has historically originated as a set of special rules and principles of general international law, intended to regulate the relations of subjects of activities in the exploration and use of outer space and other celestial bodies (or abbreviated “space activities”) (Armash, 2017).

We agree with the authors and argue that the exploration and use of outer space is human activities in outer space aimed at meeting the needs, so they should be considered as elements of the term “outer space activities” and used as equivalent.

At the national level, national space law development requires to take into account the common interests, on the one hand, the fundamental function of the State in these activities (public interest), the interests of private players (private interest), as well as the interests of all other international actors. International regulations and recommendations state that space activities should be carried out, taking into account the common interests of all countries of the world and all participants in such activities (A/RES/18/1962, 1962).

Lung-Chu Chen, an international Public Law Researcher, groups common interests into inclusive and exclusive. Inclusive ones are the needs and expectations of activities that impact on society and are also characterized by transnational and global effects. Exclusive interests, for their part, relate to the needs and expectations of activities that affect mainly the people of a single territorial community (Chen, 2000: 85).

Therefore, space activities are a unique kind of human activities, which today have an impact on almost all spheres of human life, on the one hand, they are transnational, global, and on the other, national and individual, and consequently consists of a set of inclusive, exclusive and individual interests.

Moreover, it should be noted that in various international instruments, in speeches at international events, as well as in scientific literature, together with the terms “outer space,” “space exploration and use,” the term “space development” is used. We argue that the term “development” is a comprehensive concept that includes the activities of space exploration, examination and exploitation of minerals, the organization of space tourism and space station settlements both in orbit and on the surface of celestial bodies and so on. That is, according to Sergey Krichevsky and Alexander Bagrov, it is a purposeful process (Krichevsky & Bagrov, 2019: 36), aimed at adapting outer space and celestial bodies for exploration and use for the needs of human civilization. Nevertheless, all of them are types of space activities. Ultimately, the co-development of space, including the human mission to Mars, will require many agreements and memoranda of understanding of various types, including a detailed description of space activities, international and national institutions involved in this process.

The specificity of space activities is the forced adaptation to the unusual environment, as a rule, the opposite of the earth, i.e. (non-terrestrial) environment of outer space. Nowadays, international documents do not define what outer space is, where it begins and where it ends. All this also does not add stability in space activities. The difference between airspace and

outer space has long been debated. Since outer space is an area without definite boundaries, many questions of legal jurisdiction arise.

Without going into discussion, outer space (cosmos) means interplanetary space beyond the earth's atmosphere and other celestial bodies, which is not under the sovereignty of any State and is not subject to national appropriation, within which space activities are possible, an environment in which the main force affecting a space object is gravity (Malkov, 2005).

Therefore, the above mentioned and the existing legal discourse on what is "space activities" enable us to formulate the author's original definition of this term. Outer space activities are any activities conducted by those involved in outer space activities that take into account the common interests of mankind, with due respect for international principles of sustainable development and national standards and rules.

So, the enhancement of space activities around the world and the emergence of new actors (including new space start-ups and commercial companies), as well as new concepts (such as large satellite constellations, miniaturization, satellite service in orbit, artificial intelligence, etc.) pose new challenges to the security, sustainability and stability of space activities, which in turn forces countries to develop (or update, if any) the space doctrine that has not been defined and generally recognized.

Therefore, space doctrine is a set of beliefs striving to transform the strategies and policies of sustainable, secure, innovative and inclusive promotion of space activities into specific space goals; develop the most effective space strategies to achieve these goals; and to create appropriate space organizations, systems and tactics to achieve them. Consequently, the space doctrine functions at both conceptual and operational levels, applied to different phases of the life cycle of space activities (design, production, launch, satellite deployment, neutralization operations, etc.) using different ownership forms (international, national, private) and is designed to achieve specific results.

Accordingly, these results (goals) are: 1) ensuring the long-term sustainability of space activities by mitigating the negative impact on the use of budgetary resources, environmental impact, etc.; 2) improving the security of operations in orbit by reducing the risk of collision and interference (space traffic); 3) addressing issues related to globalization, intensification and diversification of space activities and increasingly congested outer space (space debris); 4) space demilitarization; 5) implementation of the principles of inclusivity and innovation of space activities.

Therefore, the space doctrine is a set of science-based strategic areas and policies for the long-term sustainable innovative and inclusive development of space activities, taking into account national interests.

Conclusions

The mechanism of the legal regulation of outer space is a set of:

- 1) declared international guarantees for the development of outer space, based on its recognition as a value that cannot be nationalized, appropriated or damaged;
- 2) national legal means of influencing space relations that arise in the exercise of space activities by a particular country or its representatives;
- 3) the rules of private space law, which is at the stage of formation.

International norms for space exploration and use are inherently international guarantees for the development of outer space, a set of established rules that represent the freedom of outer space and its celestial bodies from any conflict situations based on the responsibility for wrongdoing, including violation of the order of carrying out research activities and the

use of outer space other than intended. In the modern paradigm of space study, they require updating in terms of their flexibility and adaptability to current practical challenges.

Adoption of the agreed Guidelines for the long-term sustainable development of space activities is intended to support the development of national and international space security practices and frameworks, while providing flexibility to adopt such practices and frameworks to specific national circumstances. Moreover, they shall support States and international intergovernmental organizations developing their space potentials in a way that does not harm the environment and the security of space operations.

The guidelines for ensuring long-term sustainable development of space activities are voluntary and have no legal force under international law. However, they may be official because States may decide to incorporate elements of the guidelines into their national legislation, as in the case of the COPUOS space debris guide.

Guidelines for the long-term sustainability of space activities should become the legal framework for a new space doctrine, based on universal international principles, which is the key to the security, stability and progressive development of world space activities in the long term that is the main goal of the global space community. In turn, the Space Doctrine aims to develop a long-term and sustainable policy for the future, to take into account existing problems and to resolve them, namely: to cover both organizational structures and operational functions; to create advanced capabilities (data, services, technologies) to support secure and sustainable operations; to determine the procedure for implementation and verification of technical and regulatory requirements (laws, regulations, standards, best practices); to provide for enhanced coordination (decision making, exchange of information) among various entities (governmental, commercial, international).

References

- 17 Goals to Transform Our World* (2015) Available online: <https://www.un.org/sustainabledevelopment/>
- A/RES/18/1962 Declaration of Legal Principles Governing the Activities of States in the Exploration and Use of Outer Space (1962) *Resolution adopted by the General Assembly (XVIII)*. Available online: <http://www.un-documents.net/a18r1962.htm>
- A/RES/2221 (XXI). UN General Assembly Resolution 2221 (1966) XXI, 19 December 1966. Available online: [https://undocs.org/en/A/RES/2221\(XXI\)](https://undocs.org/en/A/RES/2221(XXI))
- A/RES/2222 (XXI). Treaty on the Principles of the Activities of States for the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies (1966) Available online: [https://undocs.org/en/A/RES/2221\(XXI\)](https://undocs.org/en/A/RES/2221(XXI))
- A/RES/41/65 Principles Relating to Remote Sensing of the Earth from Outer Space (1986) Available online: <https://undocs.org/en/A/RES/41/65>
- A/RES/47/68 Principles Relevant to the Use of Nuclear Power Sources in Outer Space (1992) Available online: <https://undocs.org/en/A/RES/47/68>
- A/RES/51/122 Declaration on International Cooperation in the Exploration and Use of Outer Space for the Benefit and in the Interest of All States, Taking into Particular Account the Needs of Developing Countries (1996) 4 February 1997. Available online: <https://undocs.org/en/A/RES/51/122>
- A/RES/59/115 Application of the concept of the “launching State” (2004) Resolution adopted by the General Assembly on 10 December 2004. Available online: <https://undocs.org/en/A/RES/59/115>

- A/RES/62/101 Recommendations on enhancing the practice of States and international intergovernmental organizations in registering space objects (2007) Available online: https://www.unoosa.org/oosa/oesadoc/data/resolutions/2007/general_assembly_62nd_session/ares62101.html
- A/RES/68/74 Recommendations on national legislation relevant to the peaceful exploration and use of outer space (2013) Available online: <https://undocs.org/en/A/RES/68/74>
- A/AC.105/C.1/LTS/2011/L.1. Draft report of the Working Group on Long-term Sustainability of Outer Space Activities (2011) Available online: https://www.unoosa.org/oosa/oesadoc/data/documents/2011/aac.105c.1lts/aac.105c.1lts2011.1_0.html
- A/71/20 Report of the Committee on the Peaceful Uses of Outer Space Fifty-ninth session (2016) 8-17 June. Available online: <https://undocs.org/en/A/71/20>
- A/AC.105/C.1/L.348 Updated set of draft guidelines for the long-term sustainability of outer space activities (2016) Available online: https://www.unoosa.org/res/oesadoc/data/documents/2016/aac_105c_1l/aac_105c_1l_348_0_html/AC105_C1_L348E.pdf
- A/RES/73/6 Fiftieth anniversary of the first United Nations Conference on the Exploration and Peaceful Uses of Outer Space: space as a driver of sustainable development (2018) Available online: <https://undocs.org/en/A/RES/73/6>
- A/AC.105/L317 Zero draft of the “Space2030” Agenda and implementation plan (2019) Available online: https://www.unoosa.org/oosa/oesadoc/data/documents/2019/aac.105l/aac.105l.317_0.html
- A/68/189. Group of Governmental Experts on Transparency and Confidence-Building Measures in Outer Space Activities (2013) Available online: <https://www.undocs.org/A/68/189>
- Agreement on the European Economic Area* (1994) Available online: <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A21994A0103%2801%29>
- Armash, Nadiya (2017) *International Space Law*. NAU.
- Bazaluk, Oleg, and Svitlana Balinchenko (2020) Dynamic Coordination of Internal Displacement: Return and Integration Cases in Ukraine and Georgia. *Sustainability*, 12, 4123. <https://doi.org/10.3390/su12104123>
- Biehliy, Alexander (2000) *Legal regulations of world market of space services and technologies*. V. M. Koretsky Institute of State and Law of the National Ukrainian Academy of sciences.
- Chen, Lung-Chu (2000) *An Introduction to Contemporary International Law. A Policy-Oriented Perspective* (Second Edition). Yale University Press.
- Daly, Herman E. Toward (1990) Some operational principles of sustainable development. *Ecological Economics*, Volume 2, 1-6.
- Doctrine of Information Security of Ukraine* (2017) No. 47/2017, 25 February. Available online: <https://zakon.rada.gov.ua/laws/show/47/2017#n2>
- Emelin, Michael (2015) *Legal doctrine in the system of sources of common law: on the basis of the analysis of the legal system of the United States of America*. Available online: <http://test.ssla.ru/dissertation/referats/02-12-2015-2r.pdf>
- Futrell, Robert Frank (1971) *Ideas, Concepts. Doctrine: A History of Basic Thinking in the United States Air Force, 1907-1964* (Maxwell AFB, AL: Air University Press, 1971; reprint. New York: Arno Press, 1980); and Futrell, Ideas, Concepts, Doctrine: Basic Thinking in the United States Air Force. 1961-1984. Vol. II, (Maxwell AFB, AL: Air University Press, December 1989). Available online: https://media.defense.gov/2017/Jun/14/2001762884/-1/-1/0/B_0031_FUTRELL_IDEAS_CONCEPTS_DOCTRINE.PDF

-
-
- Hitchens, Tereza (2017) Rights and Freedoms in Orbit: How to Secure Space Activities. *Index Bezopasnosti*, Vol. 22 (3-4), 118-119. Available online: <http://www.pircenter.org/media/content/files/13/14875343690.pdf>
- Hedman, Niklas (2019) Past and Future of Space Governance — the case of COPUOS. Available online: https://swfound.org/media/206470/07_hedman.pdf
- International Code of Conduct for Outer Space Activities, Version 31 March 2014 (2014) Draft. Available online: https://eeas.europa.eu/generic-warning-system-taxonomy/404_en/14715/EU%20proposal%20for%20an%20international%20Space%20Code%20of%20Conduct,%20Draft
- Jakhu, Ram S., and Pelton, Joseph N. (2017) *Global Space Governance: An International Study*. Springer International Publishing AG. <https://doi.org/10.1007/978-3-319-54364-2>
- Kobzar, Oleksandr and Anna Danylenko (2019) International and National Provisions of Space Law Regulating the Use of Outer Space. *Advanced Space Law*, Vol. 3, 48-62. <https://doi.org/10.29202/asl/2019/3/4>
- Krichevsky, Sergey and Alexander Bagrov (2019) Moon Exploration: Legal Aspects. *Advanced Space Law*, Volume 4, 34-49. <https://doi.org/10.29202/asl/2019/4/4>
- Lélé, Sharachchandra M. (1991). Sustainable development: A critical review. *World Development*, Volume 19, Issue 6, 607-621. [https://doi.org/10.1016/0305-750X\(91\)90197-P](https://doi.org/10.1016/0305-750X(91)90197-P)
- Long-term Sustainability of Outer Space Activities (2019) Available online: <https://www.unoosa.org/oosa/en/ourwork/topics/long-term-sustainability-of-outer-space-activities.html>
- Lupton, D. E. USAF, (Ret.) (1988) On Space Warfare: A Space Power Doctrine. *Maxwell Air Force Base, AL: Air University Press*.
- Maksymov, Sergey (2013) Legal doctrine: Philosophical and legal approach. *Pravo Ukrainy*, Issue 9, 34-54.
- Malkov, Sergey (2005) History of legal regulation of space activity for research and development of celestial bodies in Russia. Available online: <https://www.dissercat.com/content/istoriya-pravovogo-regulirovaniya-kosmicheskoi-deyatelnosti-po-issledovaniyu-i-osvoeniyu-neb>
- Maritime Doctrine of Ukraine up to 2035* (2009) No. 1307, 7 October. Available online: <https://zakon.rada.gov.ua/laws/show/1307-2009-%D0%BF#n12>
- Millennium Development Goals (MDG) (2000) Available online: <https://www.un.org/millenniumgoals/>
- Military Doctrine of Ukraine* (2004) No. 648/2004, 15 June. Available online: <https://zakon.rada.gov.ua/laws/show/648/2004>
- Military Doctrine of Ukraine* (2015) No. 555/2015, 24 September. Available online: <https://zakon.rada.gov.ua/laws/show/555/2015>
- Military Medical Doctrine of Ukraine* (2018) No. 910, 31 October. Available online: <https://zakon.rada.gov.ua/laws/show/910-2018-%D0%BF>
- Mikesell, Raymond F. (1994) Sustainable development and mineral resource. *Resources Policy*, Volume 20, Issue 2, June, 83-86. [https://doi.org/10.1016/0301-4207\(94\)90020-5](https://doi.org/10.1016/0301-4207(94)90020-5)
- National Doctrine of Education Development* (2002) No. 347/2002, 17 April. Available online: <https://zakon.rada.gov.ua/laws/show/347/2002>
- National Doctrine of Physical Culture and Sports Development* (2004) No. 1148/2004, 28 September. Available online: <https://zakon.rada.gov.ua/laws/show/1148/2004>
-

- Newberry, Robert D. (1997) *Space doctrine for the 21st century*. A Research Paper Presented To The Research Department Air Command and Staff College In Partial Fulfillment of the Graduation Requirements of ACSC. Available online: <https://fas.org/spp/eprint/97-0427.pdf>
- Patsurkivskiyi, Petro, and Olena Savkina (2017) Tax doctrine of Ukraine: Between the skill of statism and the charibda of luminocentrism. *Pravo Ukrayiny*, Issue 9, 192-204.
- Posen, Barry R. (1984). *The Sources of Military Doctrine: France. Britain and Germany Between the Wars*. Cornell University Press. Available online: <https://www.jstor.org/stable/10.7591/j.ctt1287fp3>
- Pryshchak, M., and M. Matsko (2011) *Psychology*. Available online: https://web.posibnyky.vntu.edu.ua/icgn/3prishak_psihologiya_ch1/1271.html
- Principles Governing the Use by States of Artificial Earth Satellites for International Direct Television Broadcasting (1982) Available online: <https://undocs.org/en/A/RES/37/92>
- Puzikov, Ruslan (2013) Legal doctrine in the field of legal regulation (problems of theory and practice). Available online: <https://www.dissercat.com/content/yuridicheskaya-doktrina-v-sfere-pravovogo-regulirovaniya-problemy-teorii-i-praktiki/read>
- Report of the World Commission on Environment and Development: Our Common (1987) Available online: <https://sustainabledevelopment.un.org/content/documents/5987our-common-future.pdf>
- Report of the United Nations Conference on Environment and Development, Rio de Janeiro (1992) 3-14, Volume I, *Resolutions adopted by the Conference* (United Nations publication, Sales No. E.93.I.8 and corrigendum), resolution 1, annex II. Agreements on Cooperation for the Sustainable Development of the Mekong River Basin, 34 ILM 864. Declaration on Establishment of the Arctic Council, 1995. Available online: <http://www.fao.org/faolex/results/details/ru/c/LEX-FAOC017433/>
- Semenikhin, Igor (2016) *The legal doctrine: definition, features and structure*. Available online: <http://plaw.nlu.edu.ua/article/viewFile/60660/62282>
- Sokiran, Maksym (2019) Disaster Management, Resilience of System and Space Information Technologies. *Advanced Space Law*, Volume 3, 120-130. <https://doi.org/10.29202/asl/2019/3/10>
- ST/SPACE/49 Space Debris Mitigations Guidelines of the Committee on the Peaceful Uses of Outer Space (2010) Available online: https://www.unoosa.org/oosa/oosadoc/data/documents/2010/stspace/stspace49_0.html
- Stelmakh, Olga (2016) *International legal security mode for research and use of outdoor space for peaceful purposes*. Available online: http://idpnan.org.ua/files/stelmah-o.s.-mijnarodno-pravoviy-rejim-bezpeki-doslidjennya-ta-vikoristannya-kosmichnogo-prostoru-v-mirnih-tsilyah_.pdf
- The Inter-Agency Space Debris Coordination Committee (2011) Available online: <https://www.unoosa.org/pdf/pres/stsc2011/tech-44.pdf>
- UKRAINE 2030: Doctrine of Balanced Development. 2nd ed* (2017) Lviv: Kalvariia. Available online: <http://econom.chnu.edu.ua/wp-content/uploads/2018/03/E-Book-Doctrine-2030.pdf>
- Ursul, Arkadii (2013). Cosmoglobalistics: Interrelation of global and space processes. *Filosofskaia Mysl*, Vol. 4, 149-210. <https://doi.org/10.7256/2306-0174.2013.4.365>
- Van Hoecke, Mark, and François Ost (1998). Legal doctrine in crisis: Towards a European legal science. *Legal Studies*, Vol. 12, 197-215.

- Varii, M. (2007) *General Psychology*. 2nd ed. Center for Educational Literature. Available online: https://pidruchniki.com/19650323/psihologiya/zagalni_pitannya_psihologiyi
- Yevhrafova, Elizabeth (2013) Doctrine in Law Study and Legal Practice. *Visnyk Natsionalnoi akademii pravovykh nauk Ukrainy*, No. 2 (73).
- Zhao, Yun (2018) *Space Commercialization and the Development of Space Law*. Oxford Research Enciclopedias. <https://doi.org/10.1093/acrefore/9780190647926.013.42>