

Environmental Rule of Law in New Frontiers: Enhancing the Framework for Governance of Outer Space through Multilateralism

**Environmental Rule of Law in New Frontiers: Enhancing the Framework for
Governance of Outer Space through Multilateralism**

Kariuki Muigua

Environmental Rule of Law in New Frontiers: Enhancing the Framework for Governance of Outer Space through Multilateralism

Table of Contents

Abstract..... 3

1.0 Introduction 3

2.0 Governance of Outer Space: Opportunities and Challenges..... 6

3.0 Enhancing the Framework for Governance of Outer Space through Multilateralism 8

4.0 Conclusion 11

References 12

Environmental Rule of Law in New Frontiers: Enhancing the Framework for Governance of Outer Space through Multilateralism

Kariuki Muigua*

Abstract

This paper critically examines how environmental rule of law can be effectively applied towards governance of outer space. The paper defines outer space. It notes that outer space holds immense potential and opportunities for humanity, a situation that has led to an increase in space exploration. However, the paper also observes that outer space has become a source of escalating security threats. It examines some of the key challenges in outer space. In light of these concerns, the paper argues that it is imperative to broaden the scope of environmental rule of law in order to ensure sound governance of outer space. In order to achieve this goal, the paper examines how the framework for governance of outer space can be enhanced through multilateralism.

1.0 Introduction

Strengthening environmental governance at all levels is a key priority towards protecting people and planet. The concept of environmental governance comprises of policy, rules and norms that govern human behavior in respect of the environment¹. Environmental governance focuses on who makes decisions concerning the environment, how decisions are made and carried out, the scientific information needed for decision-making and how the public and major stakeholders can participate in environmental decision-making processes². Environmental governance therefore includes a wide range of legal and other tools employed in both the private and public sectors to foster environmental protection³.

* PhD in Law (Nrb), SC, FCI Arb (Chartered Arbitrator), OGW, LL. B (Hons) Nrb, LL.M (Environmental Law) Nrb; Dip. In Law (KSL); FCPS (K); Dip. in Arbitration (UK); MKIM; Mediator; Consultant: Lead expert EIA/EA NEMA; BSI ISO/IEC 27001:2005 ISMS Lead Auditor/ Implementer; ESG Consultant; Advocate of the High Court of Kenya; Professor of Environmental Law and Conflict Management at the University of Nairobi, Faculty of Law; Member of the Permanent Court of Arbitration (PCA) [December, 2025].

¹ United Nations Environment Programme., 'Environmental Governance' Available at <https://www.unep.org/regions/west-asia/regional-initiatives/environmental-governance> (Accessed on 30/12/2025)

² Ibid

³ Environmental Law Institute., 'Environmental Governance' Available at <https://www.eli.org/environmental-governance> (Accessed on 30/12/2025)

Environmental Rule of Law in New Frontiers: Enhancing the Framework for Governance of Outer Space through Multilateralism

It has been argued that sound environmental governance can safeguard the environment and human rights, including the right to a clean, healthy and sustainable environment, and contribute towards the achievement of all 17 Sustainable Development Goals (SDGs)⁴. Robust environmental governance frameworks provide appropriate legal, policy and institutional frameworks among other tools at the global, regional, national and local levels that will lead to a healthy and prosperous planet for both humanity and nature, now and in the future⁵.

Environmental rule of law has emerged as a powerful tool towards strengthening environmental governance for sustainability. Environmental rule of law integrates environmental needs with the essential elements of the rule of law thus providing the basis for improving environmental governance⁶. It provides a legal framework of procedural and substantive rights and obligations that incorporates the principles of Sustainable Development in the rule of law⁷. It has been argued that environmental rule of law is attained when environmental laws and policies are widely understood, respected, and enforced and the benefits of environmental protection are enjoyed by people and planet⁸. Environmental rule of law therefore provides a framework for addressing the gap between environmental laws in text and in practice⁹. Strengthening environmental rule of law can ensure robust environmental governance systems through sound management and access to natural resources, gender equality in environmental

⁴ United Nations Environment Programme., 'About Environmental Rights and Governance.' Available at <https://www.unep.org/explore-topics/environmental-governance/about-environmental-rights-and-governance#:~:text=In%20our%20globalized%20world%2C%20environmental,humans%20interact%20with%20the%20environment.> (Accessed on 30/12/2025)

⁵ United Nations Environment Programme., 'Environmental Governance.' Op Cit

⁶ United Nations Environment Programme., 'Promoting Environmental Rule of Law' Available at <https://www.unep.org/topics/environmental-law-and-governance/promoting-environmental-rule-law/promoting-environmental> (Accessed on 30/12/2025)

⁷ International Union for Conservation of Nature., 'IUCN World Declaration on the Environmental Rule of Law' Available at https://iucn.org/sites/default/files/2022-10/world_declaration_on_the_environmental_rule_of_law_final_2017-3-17.pdf (Accessed on 30/12/2025)

⁸ Environment Law Institute., 'Environmental Rule of Law' Available at <https://www.eli.org/environmental-rule-law> (Accessed on 30/12/2025)

⁹ Ibid

Environmental Rule of Law in New Frontiers: Enhancing the Framework for Governance of Outer Space through Multilateralism

governance, access to justice in environmental matters and the meaningful involvement of all people including indigenous peoples and local communities in environmental decision-making processes¹⁰.

Despite its efficacy in bolstering environmental governance, it has been argued that there is need to reform environmental rule of law in light of emerging challenges. For example, the United Nations notes that escalating security threats in and from outer space require a legally binding agreement to preserve its peaceful nature¹¹. Extending the scope of environmental rule of law to governance of outer space is therefore necessary in reducing the risk of conflicts and ensuring that the all of humanity benefits from the exploration of space¹².

This paper critically examines how environmental rule of law can be effectively applied towards governance of outer space. The paper defines outer space. It notes that outer space holds immense potential and opportunities for humanity, a situation that has led to an increase in space exploration. However, the paper also observes that outer space has become a source of escalating security threats. It examines some of the key challenges in outer space. In light of these concerns, the paper argues that it is imperative to broaden the scope of environmental rule of law in order to ensure sound governance of outer space. In order to achieve this goal, the paper examines how the framework for governance of outer space can be enhanced through multilateralism.

¹⁰ International Union for Conservation of Nature., 'IUCN World Declaration on the Environmental Rule of Law' Op Cit

¹¹ United Nations., 'Outer Space' Available at <https://www.un.org/en/global-issues/outer-space> (Accessed on 30/12/2025)

¹² Ibid

2.0 Governance of Outer Space: Opportunities and Challenges

Outer space can be defined as what lies beyond the Earth's atmosphere¹³. Therefore, the entire universe (including planets, stars, and galaxies) except Earth and its immediate surroundings comprise outer space¹⁴. The Karman Line is the internationally recognised boundary set at 100 kilometres above Earth's sea level which marks the boundary of space¹⁵. The Karman line is therefore the boundary separating the Earth's atmosphere and outer space. Outer space has been described as a vast near-vacuum expanse which starts roughly at the Karman's line comprising of celestial bodies including other planets, stars and galaxies¹⁶.

The outer space has been subject of human interest for many decades. For example, at the height of the cold war, the United States of America (USA) and the former Soviet Union were leading the space race¹⁷. This was a period of competition between the two major world superpowers at the time over who could conquer space exploration first¹⁸. It has been observed that it was the Soviet Union that brought humanity into the Space Age with their Sputnik satellite, which was successfully launched on October 4, 1957¹⁹. A few years later, on 21 July 1969, the Apollo 11 mission saw the first moon landing marking a significant milestone in space exploration²⁰. It has been observed that the race to conquer space has changed in the 21st century allowing many other countries to join the new space race²¹. Further, large private companies have also taken an interest in outer space such as

¹³ What is Outer Space., Available at <https://www.highpointscientific.com/astromy-hub/post/astromy-101/what-is-outer-space> (Accessed on 30/12/2025)

¹⁴ Outer Space., Available at <https://www.britannica.com/science/outer-space> (Accessed on 30/12/2025)

¹⁵ Statement About the Karman Line., Available at <https://fai.org/news/statement-about-karman-line> (Accessed on 30/12/2025)

¹⁶ Outer Space., Op Cit

¹⁷ What was the Space Race?., Available at <https://www.space.com/space-race.html> (Accessed on 30/12/2025)

¹⁸ Ibid

¹⁹ What was the Space Race?., Available at <https://airandspace.si.edu/stories/editorial/what-was-space-race> (Accessed on 30/12/2025)

²⁰ Ibid

²¹ United Nations., 'Outer Space' Op Cit

SpaceX with its Mars colonization programme and Blue Origin which focuses on aerospace transportation²².

The increased focus by humanity over the past decades to explore the outer space relates to the benefits that can be derived from this region. For example, the initial space race between USA and the Soviet Union was largely limited to geopolitical tensions with both countries attempting to showcase their technological superiority as a source of national pride²³. However, in the 21st century, exploration of outer space is no longer limited to geopolitical tensions. For example, it has been argued that the exploration of outer space has led to technological advancement for the benefit of humanity²⁴. Space-related technologies such as satellites are improving navigation, transportation and logistics thus ensuring human progress²⁵. Further, space exploration has improved scientific knowledge and understanding of the universe and its interconnectedness²⁶. It has also been observed that the space industry has become a significant part of the global economy that has led to the development of high-tech industries which support millions of jobs globally²⁷. In addition, it has been pointed out that celestial bodies including asteroids contain valuable resources including metals and minerals that can be harnessed in order to reduce pressure on Earth's resources²⁸. Space exploration is also crucial towards identifying potentially habitable celestial bodies to determine if conditions exist that could support life beyond Earth²⁹. Further, due to the vastness of the universe, it has been

²² Ibid

²³ Ibid

²⁴ What is a Satellite., Available at <https://www.space.com/24839-satellites.html> (Accessed on 30/12/2025)

²⁵ Ibid

²⁶ National Aeronautics and Space Administration., 'Benefits to Humanity' Available at <https://www.nasa.gov/humans-in-space/benefits-to-humanity/> (Accessed on 30/12/2025)

²⁷ Ibid

²⁸ Ibid

²⁹ Deel. G.L., 'Why Should We Explore Space? What Are the Benefits for Us?' Available at <https://www.apu.apus.edu/area-of-study/math-and-science/resources/why-should-we-explore-space/#:~:text=Space%20Exploration%20Advances%20Scientific%20Understanding,support%20life%20beyond%20our%20planet.> (Accessed on 30/12/2025)

argued that space exploration is key in understanding the origin and existence of life and whether other life forms exist beyond Earth³⁰.

The outer space therefore holds immense potential for humanity. However, this vast region also raises several governance challenges. For example, it has been observed that the increasing number of actors, both public and private, in space exploration can trigger conflicts due to varying interests among these actors³¹. Further, it has been pointed out that if not well-regulated, the high number of objects in outer space can damage and affect the peaceful nature of outer space³². This situation can lead to contamination of space and celestial bodies³³. In addition, there is a risk of outer space being used for harmful purposes such as placement of nuclear weapons presenting a major risk to international peace and security³⁴. Addressing these challenges is key towards protecting outer space and harnessing its potential benefits for humanity.

3.0 Enhancing the Framework for Governance of Outer Space through Multilateralism

It is imperative to strengthen the governance of outer space. This is key in harnessing the benefits of outer space including technological advancement, scientific breakthroughs, potential source of minerals and a deeper understanding of the origin and existence of life beyond Earth³⁵. Enhancing the framework for governance of outer space is also key in tackling threats such as conflicts, damage caused by space objects, harmful contamination of space and celestial bodies, and use of outer space for harmful purposes including placement of nuclear weapons³⁶.

³⁰ Ibid

³¹ United Nations., 'Outer Space' Op Cit

³² Ibid

³³ Ibid

³⁴ United Nations., 'Outer Space' Available at <https://disarmament.unoda.org/en/our-work/emerging-challenges/outer-space> (Accessed on 30/12/2025)

³⁵ National Aeronautics and Space Administration., 'Benefits to Humanity' Op Cit

³⁶ United Nations., 'Outer Space' Op Cit

Environmental Rule of Law in New Frontiers: Enhancing the Framework for Governance of Outer Space through Multilateralism

Multilateralism is an effective tool towards applying environmental rule of law to the governance of outer space. Multilateralism refers to a state where different countries collaborate with the main aim of coming up with solutions for common problems facing them³⁷. Multilateralism is based on collaboration between several countries to achieve common objectives, involving continuous negotiation and dialogue between member states of an international or regional organization with the aim of finding consensual solutions to global challenges³⁸. It has been observed that in an increasingly interconnected world, multilateralism has become a key approach in dealing with transnational problems and guaranteeing global stability and Sustainable Development³⁹.

Multilateralism has to a certain extent been employed for governance of outer space. For example, the first multilateral instrument to be adopted for governance of outer space is the *Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and other Celestial Bodies (Outer Space Treaty)*⁴⁰. The Outer Space Treaty prohibits the placement of nuclear weapons or any other kinds of weapons of mass destruction in outer space and the stationing of such weapons on celestial bodies⁴¹. In addition, the Treaty also establishes basic principles related to the peaceful use of outer space⁴². Further, the Agreement governing the Activities of States on the Moon and Other

³⁷ Karlsson-Vinkhuyzen. S., & Dahl. A., 'Building Effective Multilateralism for the Environment' Available at https://iefworld.org/fl/Policybrief_KarlssonVinkhuyzen_Dahl.pdf (Accessed on 30/12/2025)

³⁸ Ibid

³⁹ Morgera. E., 'The EU and Environmental Multilateralism: The Case of Access and Benefit-Sharing and the Need for a Good-Faith Test' Available at https://www.researchgate.net/profile/Elisa-Morgera/publication/267926423_The_EU_and_Environmental_Multilateralism_The_Case_of_Access_and_Benefit-Sharing_and_the_Need_for_a_Good-Faith_Test/links/545d0f690cf27487b44d492d/The-EU-and-Environmental-Multilateralism-The-Case-of-Access-and-Benefit-Sharing-and-the-Need-for-a-Good-Faith-Test.pdf (Accessed on 30/12/2025)

⁴⁰ Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies (Outer Space Treaty), Jan. 27, 1967., UNTS volume 610, p 205

⁴¹ Ibid

⁴² Ibid

Environmental Rule of Law in New Frontiers: Enhancing the Framework for Governance of Outer Space through Multilateralism

Celestial Bodies (*Moon Agreement*)⁴³ builds on the Outer Space Treaty by focusing on governance of the moon and other celestial bodies. It requires these bodies to be only used for peaceful purposes⁴⁴. Further, the Moon Agreement requires states, while conducting space exploration activities, to ensure that their activities do not harm the environment in outer space⁴⁵.

From the foregoing, it is evident that multilateralism can play a key role in extending the scope of environmental rule of law to new frontiers through adoption of global legal instruments governing outer space. In the wake of new challenges and threats emanating from outer space, it is imperative to reinvigorate multilateralism for effective governance of this region. In particular, it has been suggested that space exploration should be a collaborative effort that should embrace cooperation and diplomacy between different countries towards a common goal of understanding and harnessing the benefits of outer space for the entire humanity⁴⁶. It has been observed that space missions involving multiple countries or private entities can be more successful and bring countries together in the pursuit of common goals in outer space⁴⁷.

It is therefore imperative to strengthen multilateralism in order to effectively govern outer space. This requires countries and private entities to collaborate in space exploration missions⁴⁸. Further, in light of mounting security threats, damage to outer space and the potential of conflicts, it has been argued that there is need to strengthen multilateralism through the adoption of a new legally binding agreement that takes into account recent developments in outer space in order to preserve its peaceful nature⁴⁹. A

⁴³ Agreement governing the Activities of States on the Moon and Other Celestial Bodies., New York, 5 December, 1979., UNTS, Vol 1363, p 3

⁴⁴ Ibid

⁴⁵ Ibid

⁴⁶ Deel. G.L., 'Why Should We Explore Space? What Are the Benefits for Us?' Op Cit

⁴⁷ Ibid

⁴⁸ Ibid

⁴⁹ United Nations., 'Outer Space' Op Cit

new legally binding agreement can guarantee a weapons-free outer space, collaboration among states in space exploration including through technological exchange, and prohibition of damage and harmful contamination of outer space⁵⁰. Embracing multilateralism is therefore key towards enhancing the framework for governance of outer space.

4.0 Conclusion

The outer space holds immense potential for humanity. However, if not well governed, the outer space can also trigger threats and challenges including geopolitical tensions among states, security issues such as placement of weapons and damage and destruction caused by space objects⁵¹. Multilateralism is therefore an effective tool that can extend the scope of environmental rule of law in new frontiers through the adoption of global rules and approaches for governance of outer space. Enhancing the framework for governance of outer space through multilateralism is a pertinent ideal that should be embraced for human progress, now and in the future.

⁵⁰ Ibid

⁵¹ United Nations., 'Outer Space' Op Cit

References

Agreement governing the Activities of States on the Moon and Other Celestial Bodies., New York, 5 December, 1979., UNTS, Vol 1363, p 3

Deel. G.L., 'Why Should We Explore Space? What Are the Benefits for Us?' Available at <https://www.apu.apus.edu/area-of-study/math-and-science/resources/why-should-we-explore-space/#:~:text=Space%20Exploration%20Advances%20Scientific%20Understanding,support%20life%20beyond%20our%20planet>

Environment Law Institute., 'Environmental Rule of Law' Available at <https://www.eli.org/environmental-rule-law>

Environmental Law Institute., 'Environmental Governance' Available at <https://www.eli.org/environmental-governance>

International Union for Conservation of Nature., 'IUCN World Declaration on the Environmental Rule of Law' Available at https://iucn.org/sites/default/files/2022-10/world_declaration_on_the_environmental_rule_of_law_final_2017-3-17.pdf

Karlsson-Vinkhuyzen. S., & Dahl. A., 'Building Effective Multilateralism for the Environment' Available at https://iefworld.org/fl/Policybrief_KarlssonVinkhuyzen_Dahl.pdf

Morgera. E., 'The EU and Environmental Multilateralism: The Case of Access and Benefit-Sharing and the Need for a Good-Faith Test' Available at https://www.researchgate.net/profile/Elisa-Morgera/publication/267926423_The_EU_and_Environmental_Multilateralism_The_Case_of_Access_and_Benefit-Sharing_and_the_Need_for_a_Good-Faith_Test/links/545d0f690cf27487b44d492d/The-EU-and-Environmental-Multilateralism-The-Case-of-Access-and-Benefit-Sharing-and-the-Need-for-a-Good-Faith-Test.pdf

National Aeronautics and Space Administration., 'Benefits to Humanity' Available at <https://www.nasa.gov/humans-in-space/benefits-to-humanity/>

Outer Space., Available at <https://www.britannica.com/science/outer-space>

Statement About the Karman Line., Available at <https://fai.org/news/statement-about-karman-line>

Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies (Outer Space Treaty), Jan. 27, 1967., UNTS volume 610, p 205

Environmental Rule of Law in New Frontiers: Enhancing the Framework for Governance of Outer Space through Multilateralism

United Nations Environment Programme., 'About Environmental Rights and Governance.' Available at <https://www.unep.org/explore-topics/environmental-governance/about-environmental-rights-and-governance#:~:text=In%20our%20globalized%20world%2C%20environmental,humans%20interact%20with%20the%20environment>

United Nations Environment Programme., 'Environmental Governance' Available at <https://www.unep.org/regions/west-asia/regional-initiatives/environmental-governance>

United Nations Environment Programme., 'Promoting Environmental Rule of Law' Available at <https://www.unep.org/topics/environmental-law-and-governance/promoting-environmental-rule-law/promoting-environmental>

United Nations., 'Outer Space' Available at <https://disarmament.unoda.org/en/our-work/emerging-challenges/outer-space>

United Nations., 'Outer Space' Available at <https://www.un.org/en/global-issues/outer-space>

What is a Satellite., Available at <https://www.space.com/24839-satellites.html>

What is Outer Space., Available at <https://www.highpointscientific.com/astronomy-hub/post/astronomy-101/what-is-outer-space>

What was the Space Race?., Available at <https://airandspace.si.edu/stories/editorial/what-was-space-race>

What was the Space Race?., Available at <https://www.space.com/space-race.html>