

Aligning National and International Space Governance: Pakistan's Role in the Global Framework of Outer Space Treaties

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Abstract

This paper examines the place of Pakistan in the international space law treaties and its adherence to peaceful and responsible utilization of outer space. Pakistan, as a signatory to key treaties of the United Nations, such as the Outer Space Treaty of 1967, has been committed to making sure that space is an area of scientific development and international collaboration. The paper examines the legal regulations, involvement in international space policies, and SUPARCO's contribution to the application of space policies in Pakistan. It also brings out the attempts of Pakistan to comply with the national regulations with the international requirements and its difficulties in the development of national space capabilities. Through the analysis of the role of Pakistan in the global forums and cooperation with other nations, this study considers the input of this country and its future in the changing environment of space law.

Keywords: *international space law, global cooperation, outer space treaty, Pakistan, SUPARCO*

Introduction

Outer space exploration and utilization have become synonymous with modern technology and science development (Atif, 2020; Khan et al., 2020). With the increase of space activities to be more than a prerogative of state actors to encompass individual participants, the necessity to have extensive legal frameworks has increased exponentially (Amir & Rehman, 2024). The international space law, which is mainly the treaties of the United Nations, provides that outer space is utilized for peaceful purposes and to the advantage of all humankind (Malik & Arif, 2019).

Pakistan, being a country that has realized the strategic and developmental significance of space, has been active in these initiatives worldwide (Mefteh, 2024; Murtaza & Khan, 2020). Ever since becoming a signatory to the Outer Space Treaty of 1967, Pakistan has been in line with the ideals of peaceful exploration, non-appropriation, and cooperation among nations (Irfan et al., 2024). Nonetheless, even with its early involvement, Pakistan has a problem in coming up with a full-fledged domestic law structure to govern its increasing space operations (Usman, 2025).

This paper will discuss Pakistan's participation in international treaties on space laws, its adherence to the international treaties, and how it has institutionalized space governance. The research aims to draw on the analysis of treaties, policies, and the involvement of Pakistan in international forums to find out the successes and the areas where improvements can be made. Another significant concern highlighted in the study is the need to enhance the capacity of Pakistan in legal and technical fields to ensure that the nation is fully engaged in the global space community.

Research Justification

Increased use of outer space in communication, defence, and scientific studies has resulted in international space law becoming significant in the achievement of global peace and collaboration. With the emerging countries increasing their ambitions in space, there is a need to know how they are involved in the formulation and enforcement of these legal frameworks. As a signatory to the key United Nations space treaties, Pakistan has a large role in the area but has not been properly exploited. Although Pakistan has been an early participant in the international space law through its Outer Space Treaty and the formation of SUPARCO, its role in the global space law has received minimal discussion in the scholarly community.

The necessity to examine the legal commitment of Pakistan, the implementation of policies, and institutional frameworks in the global space governance contributes to this research. The study will present meaningful information to the policy makers, legal scholars, and the space institutions by highlighting gaps in international commitments and national application. In addition, the information on the role of the country in the global

space treaties will assist in building the capacity of the country to become a part of space cooperation in the future and provide a contribution to peaceful and sustainable space operations.

Research Objectives

1. To discuss the historical context of the role of Pakistan in international space law treaties.
2. To highlight the theoretical context of the role of Pakistan in international space law treaties.
3. To analyze the leading laws that govern the role of Pakistan in international space law treaties.
4. To identify the key challenges regarding the role of Pakistan in international space law treaties.
5. To explore the opportunities for the role of Pakistan in international space law treaties.
6. To propose effective prevention and intervention strategies.

Research Methodology

This study employed a systematic review methodology, with research objectives established accordingly. A comprehensive literature review was conducted (Komba & Lwoga, 2020). Research findings were categorized based on their content (Hiver et al., 2021; Petticrew & Roberts, 2006), and classified information was incorporated into the study by organizing it into headings (Gan et al., 2021; Pawson et al., 2005). The evaluation of classified information and titles formed the basis of the study (Page, 2021; Rahi, 2017), ensuring the integrity of the research subject and its contents (Egger et al., 2022; Victor, 2008). The criteria for selection are listed.

1. **Relevance:** Researches that directly addressed the questions posed by this study are included.
2. **Quality:** Studies that meet a certain quality threshold (e.g., methodological rigour, bias risk) are included. Most of the research is from Scopus-indexed and Clarivate Analytics journals and reputed publishers.
3. **Recency:** Consideration of the publication date to ensure that the review reflects the most current evidence. Most of the studies are from the last three years.
4. **Language:** Only studies published in English are included.
5. **Data Completeness:** Previous studies must provide sufficient data on outcomes of interest for practical synthesis; this is also ensured in this research.

This study did not use primary data from human participants; therefore, no ethics clearance letter from the ethics committee was required.

Literature Review

The development of international space law has been mainly influenced by the United Nations, which has come up with a number of treaties and declarations that tend to guarantee the peaceful utilization of outer space (Irfan et al., 2024). The main legal framework in the activities of the states beyond the Earth is a product of the Outer Space

Treaty of 1967, the Rescue Agreement of 1968, the Liability Convention of 1972, and the Registration Convention of 1976 (Yeh & Ni, 2023). Such instruments entrenched important principles, such as non-appropriation of heavenly bodies, collective responsibility of states, and enhancing cooperation among states (Mefteh, 2024).

The involvement of third-world countries, such as Pakistan, in space law has been relatively under-researched (Khan et al., 2020). Although the key spacefaring countries still control the processes of space policy formulation, the emerging countries are expected to play a significant role in facilitating equitable and balanced access to space resources (Amir & Rehman, 2024). There is an increased focus on the necessity of comprehensive international structures that would take into account the opinions and concerns of the states having developing space potential (Malik & Arif, 2019).

The interaction of Pakistan with the international space law is primarily manifested in the policy documents and reports published by the national space agency in SUPARCO (Ahmad et al., 2022). Being one of the first countries to sign the major UN treaties on the use of space, Pakistan has always been in favor of the peaceful utilization of outer space. Nevertheless, it has had a number of institutional, technical, and legislative obstacles in the successful execution of these international obligations (Usman, 2025). Even though limited academic evidence on the law framework related to space in Pakistan exists, current studies indicate the country can enhance its status by improving governance, legal frameworks, and by being more involved in regional and international partnerships (Atif, 2020). This paper is based on these observations to examine the legal commitments of Pakistan, the institutional provisions, and the future contributions of the country in the dynamic international space law.

Historical Context of the Role of Pakistan in International Space Law Treaties

Shortly after the first artificial satellites were launched in the late 1950s, the world community started developing principles of the law that would govern outer space (Ahmad et al., 2022). Having realized the importance of space technology in national development, in 1961, Pakistan formed the Space and Upper Atmosphere Research Commission (SUPARCO), which is among the first developing nations to establish a national space organization (Malik & Arif, 2019).

To show its desire to use outer space in peace, Pakistan signed and subsequently ratified the Outer Space Treaty in 1967 (Irfan et al., 2024). It also ratified other major instruments of the UN, such as the Rescue Agreement (1968) and the Liability Convention (1972) (Yeh & Ni, 2023). Pakistan attended several United Nations Committee on the Peaceful Uses of Outer Space (UNCOPUOS) meetings during the 1970s and 1980s, which brought its policies in line with international standards (Usman, 2025).

Pakistan still contributed to international cooperation and fair access to space resources despite the economic and technological constraints (Atif, 2020). With time, it shifted its interest from scientific exploration to satellite technology to facilitate

communication, defense, and education (Murtaza & Khan, 2020). This historical background mirrors the views of Pakistan that have always preached peaceful use of space and its desire to increase its legal and institutional abilities in the international space governance (Amir & Rehman, 2024).

Theoretical Context of the Role of Pakistan in International Space Law Treaties

The principles of international law, global governance, and the cooperation of the states in the peaceful outer space are the theoretical basis of this study. Based on the Outer Space Treaty of 1967, international space law is inspired by the ideas of sovereign equality, non-appropriation, and the common heritage of humankind. These principles underline that the outer space must be a place where no country holds it as its property, but which serves the interests of all nations, irrespective of their technological level.

According to legal positivism, the international obligations that states have towards each other are acquired voluntarily through treaties and conventions. The fact that Pakistan is a signatory to international space treaties is an indication that the country acknowledges the existence of these international legal norms and is bound to collective security and peaceful exploration. Besides, the international cooperation theory describes how Pakistan joined the space law as an extension of its overall objective to enhance diplomatic relations, boost technological advancement, and even equitable access to space resources. This theory can be used to examine the way Pakistan has been addressing its international space law, compliance with treaty norms, and its role in the development of the fair and sustainable global space governance system.

Laws Encompassing International Space Law Treaties in Pakistan

Pakistan has become one of the signatories of some of the major international treaties that are used as a basis of international space law. The biggest of these is the Outer Space Treaty of 1967, which provides the general outline of global space activities, focusing on the peaceful utilization of outer space and the criminalization of national seizure of celestial bodies. The Rescue Agreement (1968), which guarantees aid to stranded astronauts, and the Liability Convention (1972), which determines state liability for damage to space objects, were also ratified by Pakistan. Also, Pakistan has signed the Registration Convention (1976), whereby states are to keep and publish a list of their space objects.

In Pakistan, the space activities of the country are controlled by the Space and Upper Atmosphere Research Commission (SUPARCO), which was established way back in 1961 and is under the administrative control of the Government of Pakistan. Even though Pakistan has yet to make any serious attempt to enact a national space law, SUPARCO works in line with the international commitments and policy directions. These treaties demonstrate the fact that the country is committed to peace in its exploration, international cooperation, and international standards governing activities in outer space.

Challenges for the Role of Pakistan in International Space Law Treaties

Although Pakistan was one of the first countries to engage in international space law, there are a number of issues that it has to deal with to realize its potential contribution to international space law. Among the most significant difficulties is a lack of a national law on space to govern and enforce international obligations nationally. In the absence of such legislation, Pakistan is finding it difficult to deal with legal problems regarding the registration of satellites, liability, and commercial space operations.

The other critical hurdle is the lack of technological and financial capacity that limits the possibilities of Pakistan in the advancement of its own space technology and its effective involvement in the activities of the international space program. Organizational constraints at SUPARCO and the absence of inter-agency coordination further impair the implementation of the policy and international cooperation. Furthermore, the limitation of geopolitics and reliance on external technology have hindered the development of national space capability.

Still, the representation of Pakistan in international forums like the United Nations Committee on the Peaceful Uses of Outer Space (UNCOPUOS) is not excessive, which influences its impact on the development of future space legislation. To reinforce its position, Pakistan should improve its institutional structures, invest in research and technology, and draft national laws in line with the international conventions to ensure the sustainable and legal involvement in outer space activities.

Opportunities for the Role of Pakistan in International Space Law Treaties

Pakistan has great opportunities to enhance its presence in the international space law as well as play its part in the global space governance. Pakistan, being a signatory to key space treaties, has an opportunity to expand its existing undertakings through developing a detailed national space law that can harmonize the national laws with those of other countries. This kind of legislation would not only improve the level of compliance but also it would attract the involvement of the private sector and foreign investment in space technology. As the region takes more interest in space activities, it is possible to collaborate with others on space projects by using organizations like the Asia-Pacific Space Cooperation Organization (APSCO), of which Pakistan is one of the founding members. The advantages of these partnerships are technical expertise, resource access, and capacity building. Also, Pakistan can use its strategic geographical position to establish satellite launching and surveillance sites, which would assist in regional communication and earth observation initiatives.

Further increase in the diplomatic and legal representation of Pakistan can be achieved through academic literature and international interaction by means of the United Nations Committee on the Peaceful Uses of Outer Space (UNCOPUOS). Through innovation, education, and institutional reforms, Pakistan is able to turn the challenges into

opportunities that would enable it to become a responsible and active member in the peaceful exploration and use of outer space.

Discussion

The involvement of Pakistan in the international treaties on space law indicates that it believes in the peaceful utilization of outer space and in exploring outer space collaboratively. Nevertheless, the analysis shows that though Pakistan is a signatory to key UN treaties, international obligations, and domestic action gaps are still high. Lack of a national space law restricts good governance and regulation of new emerging space operations by the private sector.

Similarly, the countries in the region, such as APSCO, and the participation of Pakistan in the UNCOPUOS give it the opportunities to enhance collaboration, technical capability, and policy orientation. Through proper investment in legal framework, research, and technology, Pakistan can become not a passive observer of space governance in the world, but an active member. It is highlighted in the discussion that the national reforms, along with the international cooperation, are crucial to Pakistan achieving its full potential in the developing field of space law.

Conclusion

Pakistan has contributed positively but in a limited way in the formulation, as well as application, of international space law. Being a member of the major treaties of the United Nations, Pakistan has shown that it is willing to engage in peaceful and cooperative utilization of outer space. The lack of a detailed national space law, resources, and technology limitations has also curtailed its capacity to play a full role in adhering to international commitments. Nonetheless, it is possible to infer that Pakistan has a great potential to consolidate its status by means of legal reforms, institutional building, and international forums. Their increased cooperation with regional and international partners, investment in research and innovation, may make Pakistan a more powerful voice in the global space policy. To guarantee long-term development, Pakistan has to incorporate international legal standards into its domestic policy and follow a progressive strategy in the field of peaceful space exploration and technological development.

Recommendations

1. **Establish a National Space Law:** Pakistan needs to establish a detailed space law to control local operations and ensure that the country adheres to international agreements.
2. **Enhance the Authority of SUPARCO:** Scale up the institutional capability of SUPARCO through the provision of legislative and fiscal independence to facilitate the successful execution of policies by the organization.

3. **Encourage the participation of the private sector:** Invite the participation of the private sector, namely companies and academic establishments, into space research and satellite development under governmental control.
4. **Intensify International Cooperation:** Intensify the cooperation with such organizations as UNCOPUOS, APSCO, and other regional organizations to acquire technical and legal expertise.
5. **Build Human Resource Capacity:** Invest in space law education and training, space technology education and training, and space policy education and training.
6. **Create a National Space Policy Framework:** Propose a single policy to streamline the government, academic, and commercial space operations.
7. **Increase Research Investment:** Invest more in the field of law and science in space governance and new technologies.
8. **Promote Social Consciousness:** Hold enlightenment campaigns to highlight the importance of peaceful use of space and international responsibility.
9. **Form Legal Advisory Teams:** form professional teams of lawyers to examine international trends and revise local laws, respectively.
10. **Communicate with the South Asian region:** Cooperate with other countries of the South Asian region to help missions to a common space, information sharing, and the harmonization of the laws.

Research Limitations

Despite the fact that this research provides an excellent insight into the role of Pakistan in the treaties that have regulated the international space law, there are certain limitations associated with it. To begin with, recent official figures and policy documents of Pakistani organizations like SUPARCO are scarce, which limited the scope of the investigation on the national implementation. Secondly, scholarly sources on Pakistan in space law are not as numerous as those of developed spacefaring countries, which makes it difficult to compare the two.

Moreover, the study was not based on direct interviews with policymakers or legal specialists because time and resources were inadequate to conduct direct research interaction. The dynamic character of the international space law, which is being constantly developed, and there is emergence of new technologies also create problems in assuring the future relevance of findings. In spite of these shortcomings, the research offers a solid basis for conducting further research on the changing role of Pakistan in the global space governance.

Research Implications

The study has significant policy implications for policymakers, law academicians, and institutions in charge of space governance in Pakistan. Through the study of the international space treaties and their role in the global participation of Pakistan, there is a serious issue of urgency to have a national law that will harmonize local laws on the issue with international laws. The results highlight the possibility of policy changes that can help Pakistan adhere to international standards and the favorable exploration of space.

In the case of academic and legal research, the study helps fill the gap in the existing literature on the roles of developing countries in space law, which will serve as a basis to compare and conduct empirical studies in the future. It also promotes further collaboration among lawyers, scientists, and policymakers in the field in an interdisciplinary manner to solve arising issues in the governance of outer space. On the international level, the study recommends that active participation by Pakistan would help promote its diplomatic position and lead to collaboration with other world space agencies in promoting effective and fair utilization of outer space by all countries.

Future Research Directions

Future studies of the contribution of Pakistan in the international space law should dwell on the empirical and policy-based studies to fill the gap between the international obligations and national interpretation. The comparative studies that use other developing countries, including India or Malaysia, to assess the best practices in space law development and governance could be undertaken by scholars.

Moreover, research on the new role of the involvement of the private sector, the launch of commercial satellites, and how new technologies like space mining and debris management can impact the legal framework of Pakistan should be included in the research in the future. A series of interviews held with policymakers, legal professionals, and SUPARCO executives would also be helpful in gaining more practical information on the institutional challenges and opportunities.

Future studies can evaluate the economic and diplomatic consequences of Pakistan's participation in the international space forums, or UNCOPUOS and APSCO. The results of such research would be beneficial in the development of effective national policies and empowering Pakistan in its application to the international space law and peaceful space exploration.

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