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Challenges of Air and Space Law: Bangladesh Perspective

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ABSTRACT

The new dimension of the geo-strategic aspect, added with the rapid development of the aviation industry and space activities, has created a legal dilemma for Bangladesh as a developing country. However, air and space law has long been subject to international conventions, bilateral agreements, and national legislation, and such a model encounters unique challenges in Bangladesh as a developing nation due to infrastructural constraints, capacity deficiencies, and changing global standards. Moreover, the Bangladesh satellite[1], previously known as the Bangabandhu-1satellite, launching growth in Bangladesh to enhance its ability in the space sector, also raised issues in the law portion in space; perhaps changes in the Outer Space Treaty as well since there are political and legal questions as to how orbital slots are managed and allocated, taking into account concerns about the Bangabandhu-1 satellite, but it is felt that developmental projects are being sidelined amidst this political speculation. The situation gets further compounded due to limited expertise, weak institutional frameworks, and no formal and comprehensive national space law.This paper examines these challenges and contends that Bangladesh needs to adopt a stronger legal and regulatory framework, further develop regional coordination and cooperation, and invest in capacity-building to better develop and manage air and space activities. These matters must be resolved not just for the protection of national interests but also for honouring international commitments and for sustainable development of the aviation and space industries.

Keywords: Modern Law, Airspace, New Space, Legislation, Sustainable development

1.1 Introduction

National and international treaties and agreements, as well as statutes and implicated concepts, all fall into the category of space law. Space law is an expansive area, encompassing issues of exploration and exploitation of outer space, liability for damage caused to spacecraft or celestial bodies, armament on spacecraft, rescuing and returning space crew members, environmental protection against harmful pollution, information exchange against harmful surveillance, and even new legal regimes of trade secrecy and private ownership of proprietary data against intrusive interference. Space law is an interdisciplinary topic that relates to a wide variety of other legal areas, such as criminal law, environmental regulation, arms control, insurance law, agency law, information and intellectual property law, missile defense, and technology production licensing. Aerial sovereignty over a territory and its atmosphere was established alone in the first international aviation framework in 1919, but these were the first steps on the road towards space law. These full, unquestionable principles were confirmed by the Chicago Convention of 1944 [2] and have served as a trigger for the evolution of space law. Throughout the Cold War, the national space programs of both

[1] https://www.thalesgroup.com/en/worldwide/space/news/bangabandhu-satellite-1-pride-bangladesh
[2] https://www.icao.int/convention-international-civil-aviation-doc-7300

sides came together to form the 1958 Group for Space Research and Exploration of the International Council of Scientific Unions. Its first major project was the International Geophysical Year. Sputnik 1, the first artificial satellite, was launched in 1957 by the Soviet Union, and the US Congress came up with the Space Act then. It resulted in the establishment of NASA, the US space agency. With the continued development of space exploration, space law was increasingly viewed as a stand-alone subject of international law wholly separate from aviation. While the national space policy of Bangladesh is still being established, it would be interesting to see the opportunities and challenges that the developing country may face to get itself aligned in the international domain, as it is specifically acknowledged as an actor. The insight of this study will assist Bangladesh in identifying and solving its problem of space law. The Bangladesh space program must learn to pull different groups in or out of the country to work for it. Space has turned into a business: suborbital space tourism, satellite mega-constellations, and rocket reusability. Space exploration has also opened up fresh complications regarding accountability and liability, particularly around who is entitled to take decisions. Countries like Bangladesh have increasing access to space projects. In the second statement, I will use India's space policy as an example and contrast it with other developing countries to see how one of them is a step ahead compared to others.

1.2 Overview of Outer Space Treaty

Space law is derived from the Outer Space Treaty (OST) [3] the UN adopted in 1967. Bangladesh had ratified OST in 1980, meaning it was officially bound by these rules. This only heightens the gravity of this agreement in news surrounding its clandestine military nuclear program. The Outer Space Treaty (OST), created under the United Nations in 1967, serves as the governing treaty of space as a legal regime. It prohibits countries from appropriating outer space or any celestial body to itself and only promotes the peaceful use of outer space and freedom to explore outer space and limits the countries to be held responsible for any damage caused by their objects in space. Bangladesh, for instance, did not join the OST until 1980, which suggests that it had realized it was necessary to conform to international norms of conduct. The OST originated within a different geopolitical environment and centered on the behavior of state actors during the Cold War. It completely overlooks the role of the private sector, commercial space resource use, mega-constellations, space tourism, and other burgeoning technologies. Now the OST needs more rules too; the impression one gets from the report is that the OST lacks regulations and guidelines. Since 1972 these are the first weapons that the US has used in space, and in 2020 the US began drafting the Artemis Accords. These accords set the stage for peaceful activities on, and the utilization of, lunar resources by private citizens, stressing transparency, compatibility, and cooperation.

1.3 Role of the International Telecommunication Union

The International Telecommunication Union (ITU) [4]ensures that the satellite orbits and radio spectrum that make global communications possible are managed in a safe and equitable way. The ITU will be roughly responsible for providing equitable access to all (geostationary/ non-geostationary) satellite orbits to all, monitoring and coordinating all satellite networks, as well as the regulation of radio communication frequencies. The ITU is faced with increasing challenges, such as satellite mega-constellations. Moreover, its study and recommendations are crucial for the mitigation of space debris.

[3] https://www.unoosa.org/oosa/en/ourwork/spacelaw/treaties/introouterspacetreaty.html
[4] https://www.itu.int/en/Pages/default.aspx

2.1 Current Problems in Space Law

Space law has significant issues due to swiftly evolving technologies and an increasing array of interests. These difficulties necessitate the establishment of appropriate legal and policy frameworks for the sustainable and peaceful use of outer space. Some emerging space enterprises are evidently expanding and contravening the treaties that regulate activities in outer space. An organized framework of regulations and treaties, known as space law, exists to prevent issues or biases during space flight. The fundamental space law treaties include the "Treaty on the Principles Governing the Activities of States in Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies" (1967), the Rescue Agreement (1968), the Liability Convention (1972), the Registration Convention (1975), and the Moon Agreement (1979). Contemporary foundational treaties of space law address only a limited number of subjects. Firstly, as numerous renowned scientists worldwide concur, further investigation is necessary about tourism in "New Space," space debris, and climate change. We will not assert that their stance on this topic is slightly hypocritical.

2.2 Exploitation of Resources for Profit

The bottom line is to make a business out of business and to extract and utilize resources from other planets by mining objects, resources of asteroids, minerals of the moon, and other universal material culture. Countries are banned from claiming parts of the Moon and other celestial bodies under the Outer Space Treaty, but the treaty leaves open questions about the ownership of mineral and other resources that were excavated from those bodies. The Artemis Accords, for example, solve this problem by labeling any form of resource extraction or use as "peaceful" and “beneficial.”Critics argue this kind of interpretation could establish a de facto property right and question whether it violates the Outer Space Treaty, which prohibits countries from claiming territory in outer space. This ambiguity in the law is an issue for private enterprise and countries launching humans into space. According to the company, it was entitled to administer its property as it determined was appropriate. But many think the deal strikes the wrong balance between private property rights, environmental protection, and public access. If not regulated, this type of transaction could lead to a complication and a race that will render outer space unpeaceful.

2.3 Environmental Sustainability and Orbital Debris

The mass expansion of satellites, in particular the massive satellites that were launched into space by over a hundred companies, has resulted in a ton of junk in space. This debris [5]creates obstacles for other spacecraft in their ever more numerous future missions and can eventually render space unsustainable long-term. At the moment, most of the rules for cleaning up and dealing with space junk are nonbinding. Since there are no enforceable laws, the effectiveness of traditional debris mitigation measures is dubious. That's pretty basic stuff, raising questions about fundamentals like accountability and responsibility to the environment. Planetary sustainability is a standard practice to make it today. While there are ongoing attempts to enhance space traffic management and reduce debris-generating events, there are no binding measures at the international level that make these solutions sufficiently effective. This leads to issues with authority and execution. Given the nature of space activities, no one state has the jurisdiction to exercise its licensing power over space objects and their crew. The Registration Convention mandates states to register their objects with the registry if such objects are launched from their territory. Currently, there is no judicial process to address any infractions or misdemeanors in outer space. This makes the rules about handling space traffic pretty crummy, something that's surely going to lead to more

[5] https://orbitaldebris.jsc.nasa.gov/

tussles and safety issues as the region gets busier. The absence of clear laws determining which legal authority can and must decide upon disputes only complicates things further. A goal is to create a worldwide system of governance for space, including norms of conduct and enforcement mechanisms.

2.4 Difficult Processes and Rules

On the one hand, this is great news because we are seeing an increasingly interconnected world through things like space operations, but on the other hand, this increases the complexity of space law. There are some provisions of international law governing the issues that fall under the ambit of space law. The Outer Space Treaty of 1967[6], widely known as the bedrock of space law, is outdated and does not sufficiently address present-day challenges surrounding space tourism, asteroid mining, and other private and commercial endeavors. Cleaning space, or space junk, is a nasty question of the issue. The risks of accidents and debris production are also greatly intensified by the steady increase in the number of satellites being launched by both traditional and developing countries and, in the near future, private firms. This constitutes a significant risk in the context of the relay of space operations for the longer term. As a result, their liability treaties rarely contain regulations for space debris, let alone remediation, which may cause confusion and conflicting regimes. Ensuring equal access to space is another challenge. Spacefaring nations like the status quo of existing space laws, but this makes it more difficult for developing nations to participate in activities like space development. Orbital slots and frequency bands are regulated by the International Telecommunication Union (ITU). None of this evidence indicates that we should have humanitarian space rules that guarantee space resources are used by everyone. Secondly, militarization of space is a legal problem. Space militarization then becomes an issue. The Outer Space Treaty of 1967 prohibits only more mass destruction activities and remains ambiguous about rules concerning conventional weapons and anti-satellite systems. Such ambiguity is bound to create frictions and may turn space into a theater of conflict in the years to come. But these international law problems, especially those property right issues, reveal the inadequacy of the current treaty and the need for larger and more binding treaties to formalize the law.

2.5 Over-Reaching National Space Policy and Legal Framework

Bangladesh is getting forward in terms of space technology and satellite applications, but such advances are causing issues and making the scope of international space law. Although Bangladesh does not have a complete set of national space laws with adequate details for modern space operation, it prescribes the right for the state to control the residents who are either home-based entrepreneurs or people working in microbusinesses in order to comply with the international rules and in order to facilitate and protect the legitimate interests of the state. Such laws would provide far more clarity and promote investment that drives innovation. A clear national policy and regulatory framework, in line with international standards, would make such changes possible. Bangladesh: Recent Developments and Future Directions Two major recent initiatives reflect Bangladesh's Space Research and Remote Sensing Organization’s (SPARRSO) growing appreciation for the value of clear space-facilitating policies. However, the rules are still incomplete as many of the relevant laws are still to be passed.

[6] https://www.unoosa.org/oosa/en/ourwork/spacelaw/treaties/introouterspacetreaty.html

2.6 Collaborating with International Assemblies

For instance, Bangladesh's extensive participation, contributions, and initiatives in the international organization(s), such as the UNOOSA[7], and its regional by actively engaging with the regions through the Asia-Pacific Space Cooperation Organization (APSCO[8]) is a strategic approach to knowledge sharing, collaboration on technical matters, and policy making. Supported by others, Bangladesh will become better able to establish standards and engage in international debates concerning space governance. They also help Bangladesh develop the skills and technology it needs to engage more effectively in global space efforts.

2.7 Hindrance for Private Sector Participation

Spectrum Usage Conflicts: Commercial or joint venture satellites usually have unambiguous frequency rights in the laws.

Space Harm Liability: There was no national law to ascertain whether damage caused by space objects was liability of the state or liability of the private entity exemplified in Bangladesh. Participation in crucial global agreements.

The Outer Space Treaty (1967): This would determine Bangladesh's rights concerning ownership, rights of peaceful utilization, and demilitarization of outer space.

Liability Convention (1972): Bangladesh will be unable to receive compensation or contest damages caused by foreign space objects unless Bangladesh ratifies the convention. Article 2 of the Notification Convention (1976) stipulates that if Bangladesh chooses not to participate, those satellites would nevertheless be registered internationally through the standard and legal processes, lowering their legal status. On the Moon Agreement (1979), Bangladesh had no official position before 2023.

2.8 Limitations of Institutional Capability

SPARRSO, inasmuch as it has a narrow statutory mission, is not organized in a way to be directly subject to commercial regulation; it is not a regulatory body but rather a research facility.Lack of Funding: Financial expenditure never steamrolls into major progress in space technology outside of distant sensing. In addition, note that this industry is not only being affected by human resources issues but also by other problems like shortage of aerospace engineers, shortage of space lawyers, shortage of mission planners, etc.

Issues of International Cooperation: The Bangladeshi space program is not heavily involved in international organizations like NASA[9], ESA[10], or ISRO [11]yet. They might offer access to tech for shared missions. SPARRSO [12] needs more resources and manpower for the betterment of national space policy.

3.1 Early Threats and Tactical Weaknesses

Lack of a debris mitigation plan: As things stand, there is no proper debris mitigation plan to be able to track potential threats of collision by debris falling onto Bangabandhu-1 or future satellites.

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[7] https://www.unoosa.org/
[8] https://en.wikipedia.org/wiki/Asia-Pacific_Space_Cooperation_Organization
[9] https://www.nasa.gov/
[10] https://www.esa.int/
[11] https://www.isro.gov.in/
[12] https://sparrso.gov.bd/

- Orbital Slot Limitation: Since Bangladesh has developed its satellite and has yet to register withthe ITU registry, the country may encounter restrictions on the number of orbital positions reserved for the fleet in the future.
- War and other dual-use risks: Without regulatory rage, commercial technology can be repurposed for military or surveillance purposes.
- Minimal Visibility: Most people and even government employees know little about the significance of space law, making it unlikely for political influencers to lobby for legal or institutional changes.
- A national space policy or strategy must be clearly delineated. They appear to care less about legal, business, or security issues, it says. Neither does it adequately describe air safety and cybersecurity and digital aviation principles.

3.2 Recommendation

- Implement National Space Legislation, which is comprehensive treaty which covers satellites and launches and liability problems.
- Follow-up on disposal, showing that space security is a second area of great importance to the United States and ratifying key international space treaties to foster confidence and cooperation globally.
- Include drone technology and environmental laws alongside caps on cybersecurity law.
- Enhance the capacity of institutions (training, infrastructure improvement, public-private joint projects).
- Enhancing the opportunities to learn and research in this field.

4.1 Conclusion

Keep in mind that space law remained static in time with its development, while technology advanced, especially in the twenty-first century. Given the growing use of space for economic purposes, the threats that space debris pose to the environment, and the possibility of militarization of space, it is necessary to review laws and regulations at the international and national levels. We highlight the immediate necessity for clear, fair international rules about space that incentivize peaceful usage by states and businesses alike, with availability to all. Bangladesh has achieved significant milestones in space law with the successful launch of the Bangladesh-1 satellite and early initiatives to develop a national space policy. But not having such a cohesive outer space act creates a lot of challenges. Legal promptness is required in looking into immediate problems such as liability in case of damage, management of orbital slots, prevention of space debris, and protection of national security and commercial interest. Secondly, the new global conversations related to the Artemis Accords, use of space resources, and space sustainability reinforce that Bangladesh must take a proactive approach in various international forums under the auspices of the UN Office for Outer Space Affairs (UNOOSA). Bangladesh can move forward in a two-pronged manner, playing the conformer to existing international regimes, e.g., the Outer Space Treaty of 1967, and, on the other hand, through domestic legislation that is more attuned to national contexts. Investment in capacity-building, regional cooperation (most critical within South Asia), and partnerships with states with advanced space technology to promote, facilitate, and get equitable access to outer space is equally important. Bangladesh can manage its own nation risks on one hand while becoming a responsible and progressive player in air and space governance by institutionalizing a sound legal regime for civil air and space activities. Such a framework will be vital for safeguarding sovereignty, ensuring sustainable development, and ensuring the benefits of air and space technologies play a role in the long-term prosperity of the nation.

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