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Space Warfare: Legal Regulation of Anti-Satellite (ASAT) Weapons under International Humanitarian Law and Space Law

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ABSTRACT
This paper scrutinizes the disposition of Space Laws; in a way they are being followed by countries in current geopolitical and Astropolitical situation. There are many international treaties which deal with space but hardly any treaty which state that whether Anti-satellite (ASAT) weapons are permissible, when it comes to International Humanitarian Law? This Paper gathers all vital information which can clarify the legal capacity of this question. The paper also discusses the comments of countries which possess this technology and the reason which made them to ban these weapons.

Keywords: *Artificial Intelligence, Criminal Justice System, Policy and Surveillance, Rule of Law and AI Accountability.*

Introduction

Space has become a vital portion of modern life because most critical systems on Earth depend on satellites which are linked with communication, navigation, banking, defense systems, weather monitoring, and emergency response. Because of these requirements, space is no longer only a scientific domain; it has also become a strategic and military domain and states are now developing technologies that can target satellites, commonly known as Anti-Satellite (ASAT) weapons. The expansion of ASAT weapons has created serious legal questions because international law does not clearly regulate their use as existing space law framework, especially the Outer Space Treaty of 1967 that was created when space activities were peaceful in nature so it does not clearly address modern military actions in space. At the same time, International Humanitarian Law was developed mainly for land, sea, and air warfare and does not specifically mention space warfare. This creates a legal gap where ASAT weapons exist in practice but are not properly regulated in law. This research focuses on analyzing this gap and understanding how international law applies to ASAT weapons. It also examines whether current legal systems are sufficient or whether new legal frameworks are required.

Research Questions

1. Whether Anti-Satellite (ASAT) weapons are legally permitted under existing international space law.
2. How International Humanitarian Law applies to the use of ASAT weapons during armed conflict.

3. Whether the current legal framework is sufficient to regulate space warfare or if there are significant legal gaps.
4. How different states justify or criticize the development and potential use of ASAT weapons in light of international law.

Research Methodology and Legal Framework

This research paper follows a doctrinal legal research method which is based on the study and interpretation of existing legal sources such as international treaties, United Nations documents, customary international law, and academic writings, it does not use field data or statistical analysis. Instead, it focuses on legal analysis and interpretation of existing norms.

The framework of this research is based on two main areas of international law ones include space law consist of Outer Space Treaty of 1967 and Liability Convention of 1972, and related UN space treaties which institute the focus on peaceful use of outer space, state responsibility, and liability for damage caused by space objects. The second framework is International Humanitarian Law, based on the Geneva Conventions and Additional Protocols of 20th Century which consist of laws that regulate armed conflict and include principles such as distinction, proportionality, and necessity. These principles are applied in this research to scrutinize the legality of ASAT weapons.

Literature Review

The legal discourse on anti-satellite (ASAT) weapons is mainly grounded in the intersection of international space law and international humanitarian law (IHL), where academics consistently highpoint a controlling vacuum regarding kinetic and non-kinetic counter-space capabilities, furthermore, early foundational work underscores that the Outer Space Treaty (OST) 1967 remains the basis of space law, establishing principles of peaceful use and state responsibility, yet it does not openly prohibit conventional ASAT weapons, creating interpretive uncertainty in modern military space operations (UNOOSA, 1967). Building on this, Prominent Expert argue that the treaty framework was designed during the Cold War and therefore lacks precaution regarding technologically advanced space warfare systems such as co-orbital ASAT platforms and directed-energy weapons (Jakhu, 2017). Furthermore, the space law regulates state liability and authorization of space activities which fails to address hostile acts in orbit, leaving enforcement dependent on general international law principles (Dunk, 2015).

Later researchers focus toward the application of IHL in outer space, mainly the principles of distinction, proportionality, and necessity. Michael N. Schmitt argues that although outer space is not clearly excluded from IHL, applying traditional battlefield principles to satellite warfare is legally complex due to the dual-use nature of most space assets (Schmitt, 2013) which increases to destruction of satellites through kinetic ASAT weapons generates long-lasting orbital debris, potentially violating the proportionality principle due to indiscriminate and enduring harm (Jasani, 2005). In parallel, UNIDIR reports emphasize that space security is progressively threatened by state practice, particularly ASAT testing by major space-faring nations, which demonstrates an emerging norm conflict between military necessity and space sustainability (UNIDIR, 2020). More recent academic commentary also suggests that cyber and electronic ASAT methods further blur the legal distinction between armed attack and non-physical interference, complicating the threshold for use of force under Article 2(4) of the UN Charter (Cheng, 2012).

In addition, policy-oriented literature stresses the absence of binding arms control mechanisms particular to outer space warfare as the United Nations Office for Outer Space Affairs (UNOOSA) acknowledges that existing treaties regulate weapons of mass destruction in orbit but remain silent on conventional ASAT systems, thereby creating a strategic loophole

exploited by technologically advanced states (UNOOSA, 2021). Masson Zwaan argues that the current legal rule relies deeply on customary international law and soft-law instruments, which lack enforceability in preventing escalation of space militarization (Masson-Zwaan, 2019), contemporary analyses in space security studies conclude that without a dedicated treaty on space weapons or a prohibition on debris-generating ASAT tests, the sustainability of the orbital environment is at risk, potentially undermining all civilian and military satellite infrastructure globally (Boley, 2020).

Research Gap

There is a clear gap in current international law regarding Anti-Satellite (ASAT) weapons, although space law establishes universal principles such as peaceful use of outer space and state responsibility, it does not specifically regulate the enlargement, testing, or use of ASAT weapons which creates uncertainty in how such weapons should be treated under international law.

Another major gap is present in the application of International Humanitarian Law to space warfare, IHL provides rules for armed conflict on land, sea, and air but it does not directly address the unique environment of outer space issues such as orbital debris, dual-use satellites, and long-term environmental damage all these are not properly covered under existing legal principles. Additionally, there is no devoted international treaty that precisely regulates ASAT weapons, this absence of an obligatory legal instrument permits states to develop and test such weapons without clear legal limitations, as a result, the legal system remains fragmented and reactive rather than preventive.

Findings

1. International space law does not explicitly prohibit Anti-Satellite (ASAT) weapons, creating a legal vacuum in modern space warfare regulation.
2. The Outer Space Treaty focuses on peaceful use of outer space but does not address conventional military attacks on satellites.
3. International Humanitarian Law can apply to space warfare, but its principles are difficult to implement due to the dual-use nature of satellites.
4. The principle of proportionality is challenged because destruction of satellites creates long-lasting orbital debris affecting civilian infrastructure.
5. The principle of distinction is unclear in space because most satellites serve both civilian and military functions.
6. State practice shows that major powers continue developing ASAT capabilities despite calls for space weapon restraint.
7. There is no international enforcement mechanism specifically designed to regulate or monitor ASAT weapons.

Discussion

The analysis shows that ASAT weapons exist in a composite legal environment where multiple legal systems overlap but do not fully regulate the issue as space law provides a general framework for peaceful use of outer space but does not address hostile military actions, it leaves a significant gap in legal regulation.

International Humanitarian Law delivers useful principles for regulating armed conflict, but applying them to space is difficult as satellites are often dual-use, which makes it hard to determine lawful military targets on the other hand destruction of satellites creates orbital debris that can remain in space for decades, affecting both military and civilian systems globally. State behavior further complicates the issue, the Countries such as the United States, China, Russia, and India have developed or tested ASAT capabilities. While some of these states argue that such weapons are necessary for national security and deterrence, others view them as destabilizing and dangerous for long-term space sustainability.

Recommendations

1. A new international treaty should be developed specifically to regulate or prohibit Anti-Satellite (ASAT) weapons.
2. States should agree to ban kinetic ASAT tests that create long-lasting orbital debris.

3. Existing International Humanitarian Law should be clarified through specific guidelines for space warfare.
4. The United Nations should strengthen monitoring mechanisms for military activities in outer space.
5. States should increase transparency and share information about space security activities to reduce mistrust.
6. Legal reviews of new space weapons should be made mandatory under Article 36 of Additional Protocol I.
7. International cooperation should be promoted to ensure that outer space remains peaceful and sustainable.

Conclusion

In conclusion, Anti-Satellite weapons exist in a legal grey area under current international law because space law promotes peaceful use of outer space but does not directly regulate these weapons whereas International Humanitarian Law provides general principles for armed conflict but is not fully adapted to the unique nature of space warfare, this absence of a specific legal framework creates uncertainty and increases the risk of conflict in space. As more states develop ASAT capabilities, the need for clear international regulation becomes more urgent, without new legal instruments, outer space may become a militarized environment that threatens global security and the sustainability of space infrastructure.

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