

| Muhammad Tehsin * |

Space Weaponization and Strategic Stability in South Asia

Abstract

States are investing extensively in outer space to establish military supremacy as it is the new battleground. Space has advanced to become a crucial component of military and security operations in recent decades, posing new opportunities and difficulties for the defence and intelligence communities. However, India is also advancing its capabilities in outer space, and its efforts to militarize space will have a severe impact on Pakistan and the instability in the region. Indian militarization of outer space and pursuit of eventual weaponization will result in a needless arms race between Pakistan and India. The long-standing competition, as well as the mutual deterrence strategy between India and Pakistan, is the principal root cause of instability in South Asia. Pakistan retains the option to adopt directed energy weapons (DEWs) by deploying them in military satellites, which can be used for orbital bombardment.

Key Words: Space Weaponization, Balance of Power, Anti-Satellite Weapons, Arms Race, Outer Space

Introduction

No space treaty explicitly defines what space actually is, and there is disagreement over what is meant by the term "non-military use" of space. As a result, for more than 50 years, technology has been used to detect and attack foes as part of the weaponization of space. Examples of the recent and effective use of the most advanced space navigation, command, target accuracy, and satellite communication technologies are evident from the conflicts in Bosnia, the Gulf, Afghanistan, Iraq, and Ukraine (Arif, 2019). Various accords restrict space-based military operations, notably the Limited Test Ban Treaty, the Outer Space Treaty, and the Anti-Ballistic Missile Treaty. However, these agreements fail to prohibit space-based or anti-satellite (ASAT) weapons, while a resolution on Proposed Prevention of an Arms Race in Space Treaty (PAROS) to prevent an arms race in space is also being considered.

South Asia is an area of immense significance due to its strategic position, the strategic interests of global powers, and the escalating Indo-Pak hostility along with their nuclear capability. The region served as a battlefield for proxies of superpowers, the US and the former USSR, throughout the Cold War. South Asia's politics is mostly focused on Pakistan and India. Despite having a lot of historical, cultural, and geographical similarities, the two countries have never had close relations. India aims to increase its arsenal since its interests have been extending beyond its immediate borders to the regional level.

Now, it looks like India wants to weaponize outer space, apparently in response to China's ASAT (anti-satellite) test in 2007 (Heginbotham, 2015). Such goals will undermine South Asia's strategic stability and spark an unneeded and expensive space arms race. This study aims to determine how India's space dominance affects Pakistan and provide ways to address this strategic imbalance. Although it has been militarized, weapons have yet to be used in space. Space weaponization could lead to an arms race in space, while the utilization of space will determine the outcome of future armed conflict.

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Outer Space Militarization and Weaponization

These are two related but different concepts. The deployment of communication satellites and the use of satellites by militaries around the world for command and control, monitoring, communication, and navigation via the Global Positioning System (GPS) led to the militarization of space (Peoples, 2011). This means that even without putting any weapons in orbit, military personnel worldwide use space for purposes other than peaceful ones. These satellites are used in programs for enemy monitoring to battle and defeat adversaries. As a result, the militarization of space has been around for a while.

On the other hand, the term "weaponization of space" often refers to the implantation of lethal weaponry in space. Some analysts classify and include weapons that are grounded but intended to attack space targets as belonging to the category of space weapons, such as anti-satellite weapons (Kuplic, 2013). Weapons like hypersonic technological vehicles and the US ballistic missile defence can strike targets using ballistic missiles and spacecraft, which can also travel across space to reach their targets (Cho, 2018). Nations like the US, Russia, and China have already tested these weapons to destroy space objects. These weapon systems have yet to be utilized against enemy space assets, although states may employ these strategies to disable or disrupt the communication or surveillance infrastructure of other nations. These nations can start a new era of warfare by launching weapons into space and destroying space assets.

Indian Space Program

The Indian space program's development was influenced by its quest for the status of significant power and its rivalry with other countries in political or economic domains. The National Committee for Space Research made considerable progress in India in building rockets throughout the 1960s, with the assistance of the National Aeronautics and Space Administration (NASA), and successfully sent its maiden rocket into space orbit. However, the Indian Space Research Organization (ISRO), the government of India's primary space agency, was established during the late 1960s to enhance technological advancement in space and make it useful for further security, development, and well-being at the national level (Sharma, 2010).

Although the Indian space program mostly remained civilian in character and centred on socioeconomic development, clear shifts have led to military use of space in recent years (Moorthi, 2004). India also advanced Geosynchronous Satellite Launch Vehicle (GSLV) development following the launching of its first satellite, i.e., Satellite Launch Vehicle (SLV-3), in 1975. Due to the limitations of the low earth orbit, India was initially incapable of using its satellites for military and commercial purposes. However, it now has the potential to launch its satellites into geostationary orbit from a great height. In 1983, India also launched a dual-purpose satellite system, the Indian National Satellite (INSAT), and the satellite program for Remote Sensing, which has a military's ability to communicate, monitor, and conduct surveillance.

In 2007, India introduced the Polar Satellite Launch Vehicles, entering a new age of satellite launch and recovery while ballistic missiles can be made from these Indian launch vehicles (Mistry, 2012). Between 2008 and 2014, the ISRO successfully guided satellites near the Moon and Mars, making India the fourth nation after the US, the European Space Agency, and Russia to circle a spacecraft around Mars (Rajagopalan, 2011). However, the military sector is taking over the Indian space program as it shifts away from civil uses. Due to the dual usage of space assets, a security conundrum will arise on a regional and global scale.

Weaponization of Outer Space by India

India is attempting to get a technological advantage over its rivals as the big nations are known for their lunar missions and human spaceflights. The idea of self-reliance encourages India to develop a comprehensive national space program, and India is looking to become a great power through these initiatives. Indian Headquarters Integrated Defence Staff, in a 2010 policy paper, revealed its plans to

create weapons that can physically and electronically destroy satellites in geosynchronous and low-earth orbit (Staff, 2010).

Indian scientist V. Siddhartha stated that the satellites used by India for remote sensing, communications, and meteorology have aided in developing its ballistic missile defence system and are helpful in outer space command, weapons of ASAT, and force application assets (Siddhartha, 2000). India established an Integrated Space Cell in June 2010 to create military capability in outer space amid increasing threats to Indian space capabilities, particularly to respond to China's growing threats in outer space (Ahmad, 2013). India has made several adjustments to its organizational structure, along with advancements and modifications to the practical application of satellites. Furthermore, India has strengthened its command and control by creating a new Assistant Chief of Naval Staff position to manage military space capabilities (Rajagopalan, 2017).

As part of its Ballistic Missile Defense (BMD) program, India has made accommodations for the ASAT. High-altitude interceptors can destroy low-orbit satellites by acting as ASAT devices, while the ASAT defence system demonstrates India's capacity to destroy a rival's satellites. The satellites will improve intelligence, surveillance, and reconnaissance capabilities (Sarkar, 2011). India destroyed one of its satellites in space in March 2019 to successfully test an anti-satellite weapon and became the fourth nation in the world cable using ASATs after the US, Russia, and China. This capacity also increases India's potential to utilize space for weapons.

Potential Dangers from Space

For the 2017-18 fiscal year, India and Pakistan's defence budgets have been increased, underscoring an increasing danger to the delicate power balance between the two nations. One of the biggest arms consumers in the current era, India, boosted its purchases by 10 percent, increasing the anticipated 53.5 billion dollars total for the defence budget (Upadhyaya, 2019). India is attempting to replace outdated weapons with modern ones to establish sufficient deterrence against Pakistan and China. Defence modernization is regarded as a vital tool for achieving Indian strategic goals. It is essential to pay attention to the increase in the Indian defence budget. This implies that Indian military power will modernize and develop in terms of technology, endangering the current strategic environment.

The Indian space program was once primarily meant for civilian uses, but its space policy has changed (Rajagopalan, 2017). The program clearly poses a threat to global security; hence, steps must be taken to stop its spread. India seeks to stay one step ahead of its competitors in every field, which has driven it to purchase space weapons. It strives hard in the fields of economics, politics, and the military to become a significant power (Nadkarni, 2013). The Indian effort to dominate space appears to accord with this objective, but the implications are concerning. How states respond to space capabilities would directly impact the stability and security of the region. Due to the creation and application of weapons in outer space, space may become a new theatre of war.

Several agreements have been signed to reduce the threat of outer space weaponization and to limit the use of weapons in space, including the Outer Space Treaty, the Strategic Arms Limitation Treaties, the Moon Agreement, the Limited Test Ban Treaty, the Anti-Ballistic Missile Treaty, and the resolution of PAROS. Karl Hebert (2014) has also advocated a stringent enforcement framework to counter the dangers that outer space weaponization poses to the world. However, international laws currently in place to prevent the spread of outer space weaponization need to be revised.

Space Program of Pakistan

Pakistan began its space program in the wake of the Soviet Union's Sputnik Satellite launch in the 1960s. It established an independent space agency in the early 1960s in compliance with the Pakistan Atomic Energy Commission (Arif, 2018). Soon after, a research division, the Space and Upper Atmosphere Research Commission (SUPARCO) carried out development in science and technology.

NASA assisted SUPARCO in 1961 in launching the first rocket, Rehbar 1. However, Pakistan successfully launched an unmanned spacecraft, becoming the tenth nation in Asia to do so, and further accomplished multiple missions during the early 1970s.

A series of satellites for communication purposes, namely the "Badr Series," was also launched in 1990 in coordination with China, while a Ukrainian rocket was used to launch Badr-B in 2001. The space collaboration between China and Pakistan is recent yet rapidly expanding and developing. The nations created a geosynchronous communications satellite with built-in monitoring capabilities in March 2009. The space collaboration between China and Pakistan is recent yet rapidly expanding and developing. Both nations created a geosynchronous communications satellite with built-in monitoring capabilities (driven by a ground station) in March 2009 (Lele, 2017). Pakistan's primary communication satellite, PakSat-1R, was developed by China in 2011. However, Pakistan's space agency moved its geo-location monitoring to China's operational Bei Dou navigational system (BDS) platform in December 2012 (Lele, 2017).

The space-related transactional relationship between Pakistan and China has become advantageous for both nations, particularly for Pakistan's security requirements, which are supplemented by the use of Chinese space assets (Mehdi, 2019). SUPARCO is developing the Pakistan Remote Sensing Satellite, which is scheduled for launch in 2030. The National Command Authority (NCA) also authorized the Pakistan Space Vision 2047 in 2011. In his speech, the SUPARCO chairman stressed the mission statement, which utilizes all facets of space science, technology, and application for national security and welfare. Pakistan may eventually decide to follow the example of its neighbours and take the necessary course to meet its national security needs as a result of the rapid change in space technologies for military applications in South Asia.

Strategic Implications for Pakistan

The security and stability of the area will depend on the tense relationship between India and Pakistan. India currently surpasses Pakistan in conventional warfare, and its space program will increase its strategic and military aptitude. Even though India first claimed that its space program was only intended for peaceful objectives, Pakistan can be targeted through the employment of mini-satellites by India. As the Defense Research and Development Organization (DRDO) chief stated, the mini-satellites would provide the Indian military forces with the requisite technical assistance on the ground (Pandit, 2012).

Such developments will seriously affect Pakistan's strategic stability and contribute to regional instability. They will also begin an inevitable arms race, which will force other nations to follow suit. India will have an advantage over an enemy or rival if it uses space satellite services effectively, as it will receive precise information from the satellite program regarding adversary missile sites and army movements (Ahmed, 2017). It is worrying for Pakistan that India will be able to keep an eye on troop movements in Pakistan, allowing it to make preparations based on up-to-date information.

Pakistan will be affected by India's increase in ASAT capability and its eagerness for BMD, which would ultimately involve countermeasures. Given the nation's unstable economy, it would be difficult for Pakistan to follow suit. India has been able to participate in export control regimes easily, and there are currently plans to create a suitable environment for India to join the Nuclear Suppliers Group (NSG) permanently. If it materializes, the technological advancement will be boosted further and have a destabilizing impact, giving India an edge over Pakistan (Jaspal, 2013).

Space weapons are erratic and delicate. India has expressed an intention to develop lasers and anti-satellite technology to protect its deployment in outer space. If these weapons are deployed in space, it will be fatal for humanity. However, Pakistan, in particular, would be directly threatened by India's space weaponry. The militarization of outer space and subsequent weaponization would endanger Pakistan and compel it to alter its approach regarding nuclear weapons.

Recommendations

The security establishment and decision-makers in Pakistan need to prioritize strengthening the National Space Program to resist the threat of Indian hegemony in space and stop being entirely dependent on China and the US. Given that, Pakistan needs to be cautious, as it may be seriously threatened by the Indian space program's scientific advancements due to its knowledge of silos, army movements, and capacity to hit them.

Pakistan needs both its launchers and a launch site for spacecraft. It must have a launch vehicle and a location to construct a launch pad. It is high time for Pakistan to establish an autonomous, independent space program. Given the shifting geostrategic landscape, it needs to concentrate on internal balancing. Pakistan should pay close attention to India's increased defence budget allocations, which show that it seeks to improve its conventional and unconventional military power. Pakistan has achieved significant advancements with the successful launch of the ballistic missile Nasr. However, to build a more robust nuclear triad, Pakistan must develop nuclear-powered submarines since they are concealable and can stay underwater for extended periods of time.

The current regional strategic environment would compel Pakistan to take action to address the challenges to its security. These actions will start a weapons race in outer space and exacerbate the already unstable situation in South Asia. Pakistan can bring this issue before the U.N. along with other nations, as India's aggressive approach jeopardizes the security of Pakistan and the regional states. However, in order to maintain rational deterrence and military parity with India, Pakistan can pursue the low-cost option of directed energy weapons (DEWs) (Obering, 2019). If Pakistan adopts DEWs by deploying them in military satellites, they could be used for orbital bombardment.

The DEWs are undergoing experimental stages in different parts of the world. Some states are already deploying them for their security. As a result, these weapons are less mainstream and need an introduction for most of the readers. DEWs are a set of weapons that utilize the power of the electromagnetic spectrum, harness it, and bombard a target with the power of an atom "to disable damage or destroy adversary equipment, facilities, and personnel." Instead of the usual projectiles, bullets, and shells, we get to see in conventional warfare, laser, microwave, particle beams, and sound beams are some of the power sources and manifestations of DEWs. Currently, they are being mounted on air, land, and sea-based vehicles while their power is gradually increasing. However, during the early 1980s, there was an entire program in the United States called the "Strategic Defense Initiative", where the development of such weapons was envisaged. This was inspired by the Hollywood producer George Walton Lucas Jr., who created the science fiction film series *Star Wars* with space as its domain.

The satellites are essential vehicles in space, and they play several roles. They are primarily released into orbit around Earth for communications, navigation, and observation—remote sensing. The military also uses satellites for the reasons above and for intelligence gathering. Installing nuclear weapons on military satellites is not feasible due to the international laws enacted.

The Article IV of the Outer Space Treaty prohibits the militarization of space through nuclear weapons. It also prohibits military installations on celestial bodies. However, conventional weapons and DEWs can be used, provided they are not installed on any natural satellite, such as the moon. If DEWs are installed on military satellites, they can achieve national security objectives through orbital bombardment. Orbital bombardment is a military concept that originated in the *Star Wars* film series. A target on Earth is engaged from an orbit in space through a vehicle equipped with cannons.

If satellites could be used for peaceful purposes, why not deploy DEWs to maintain deterrence? Hence, a satellite in orbit with DEWs could take out any target worldwide. Installing laser and microwave weapons on military satellites has several advantages: speed and ease of access to targets on Earth; avoidance of indiscriminate killing; infinite firepower- no need to reload the weapons with expensive transportation visits to the vehicle as would be required in case conventional weapons are installed on satellites; the satellite would be at a greater advantage of being out of reach of most of the weapons, though anti-satellite weapons are in development; enemy communication lines could be jammed with microwaves; and finally, a hostile military satellite could be taken out of the space or deterred and forced to steer away.

As mentioned earlier, the United States had begun work on DEWs in the 1980s to guard America against Soviet intercontinental ballistic missiles (ICBMs) and submarine-launched ballistic missiles (SLBMs). The work was later discontinued due to international pressure, destabilizing the deterrence equation between the former USSR and the US. Nonetheless, now America has its first-ever Space Force planning to use DEWs to gain space superiority. Pakistan, too, should work on this front and endeavour to increase research in laser and microwave technologies. This would improve Pakistan's offensive and defensive capabilities manifold and give her further strength to protect herself against hostile states. This could become a new deterrent that would complement all other types of warfare in the future.

Space is included in the sovereignty of a state, which is exercised and applicable to its territorial land, waters, and sky. Space consists of a state's territorial area for maintaining its integrity because hostile surveillance aircraft and satellites operate in this dimension, collecting information before making war plans or simply generating intelligence reports. This constitutes a breach of privacy. Even though it is difficult to designate a specific spot in space to Earth's movement and rotation- and claim it as a nation's territorial property, this could be overcome by understanding the notion that any space coordinates that would directly overlap with the territorial land below should be accepted as a nation's property. To comprehend this, take an analogy of seas and oceans. They keep flowing constantly, but whatever waters are present in the specific proximity of a country's shores are marked as territorial waters. No unauthorized ship can operate in it. The same is the case with the sky. It is all air that keeps on shifting with Earth's rotation; however, there are specific limits above the land that mark a country's airspace. Any unlawful entrance is met with a warning to leave the premises. The same concept can be applied to space right above to guard the national interest.

Conclusion

India's space program is expanding rapidly due to its desire for regional hegemony and supremacy, driving its ambition for space weaponization. To offset China's growing influence in South Asia, India wants to strike a balance between its capabilities and those of China. South Asia's primary regional challenges revolve around the animosity between India and Pakistan. A closer examination of the situation indicates that Pakistan's security will be at risk from India's efforts to militarize space, given the history between the two countries. It is becoming increasingly clear that there is a trend toward the "weaponization" of space and an arms race there. However, the strategic stability will be significantly affected if space weaponization occurs in South Asia.

To conclude, Pakistan has biological, chemical, conventional, electronic, nuclear, and cyber warfare instruments. It is time Pakistan ups the ante by adopting DEWs and installing them on military satellites over Pakistan's space. It would provide speed and easy access to targets on land and water, as well as infinite and high-precision firepower with accountability to jam and take out enemy machines on Earth and in space.

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