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Space Programs of India and Pakistan: Military and Strategic Installations in Outer Space and Precarious Regional Strategic Stability

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ABSTRACT

Outer space can be used for military and strategic purposes. The growing dependence of militaries on outer space assets in pursuit of operational and communicational undertakings make them productive assets and plausible targets for adversaries. Such threats push the states to take measures to secure their space assets. India is developing its dedicated military satellites for Command, Control, Communications, Computers, Intelligence and Surveillance (C4ISR) capabilities. The progress in military assets in outer space, Ballistic Missile Defense (BMD) system, antisatellite weapons, surveillance, and intelligence capabilities are a major concern for Pakistan. Strategic stability in South Asia is under question, and there is a need to analyze the changing security dynamics of the region. This article provides a detailed overview of India's recent development on BMD system and other space assets of India and Pakistan. The emerging technologies will have serious implications for strategic stability in South Asia. This article is an attempt to understand the potential security scenarios between India and Pakistan and concludes that the technological asymmetries may lead to strategic instability.

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its satellites in LEO. The Indian military has announced that it also has a strong KE-ASAT capability. In February 2010, P.V. Naik argued that "Our satellites are vulnerable to ASAT weapon systems because our neighborhood possesses one." [61] Some people claim that Agni-II and Agni-V possess the capabilities of ASAT [62]. Such rationale has serious political and strategic implications. Even if India does not test ASAT, its pursuit for ASATs put the regional stability at risk. Apart from debris-related issues, India's ASAT capability would provoke Pakistan to acquire ASAT as well. Pakistan considers TES, RISAT-1, and RISAT-2 as potential threats, but Pakistan currently has no guidance and steering capability to target a satellite in LEO. However, India's acquisition would motivate Pakistan to invest more resources into it. Rather than protecting, it would make assets in LEO vulnerable. Terrestrial deterrence theory cannot replicate in space. Any action in space has an impact on assets of all states. Another ASAT test by any state would add more debris, leaving all LEO satellites in a more vulnerable state.

1.13. Implications for strategic stability in South Asia

Deterrence theory revolves on the rationale that the fear of nuclear weapons restrains adversaries from any military adventure which could escalate into a full-scale war and optimists claim the nuclear weapons as a stabilizing factor between the enemy states. However, in South Asia, the introduction of nuclear weapons has fostered an arms race and could not prevent war. India and Pakistan have thought to establish strategic stability by balancing the nuclear capabilities. As a small country with little conventional military capabilities, it was advantageous for Pakistan. In the context of stability-instability paradox, the instability has always been more exacerbating than the stability. It argues that the strategic balance of nuclear weapons in South Asia was a miscalculation. During the Cold War, both India and Pakistan were developing their nuclear programs. As they got closer to their weapons, they began testing each other's limits. After the nuclear tests of India and Pakistan, contrary to the expectations, nuclear deterrence could not prevent Kargil crises.

The Kargil War of 1999 between India and Pakistan and cross-border terrorist activities hustled up the efforts to launch reconnaissance and surveillance satellites. Cartosat-1, Cartosat-2, RISAT-1, and RISAT-2 are serving the military purposes. Presently, Indian satellites are unable to cover the entire region and are not capable of maintaining round the clock coverage in a real-time scenario. Pakistan does not consider this a severe threat yet but with the growing number of satellites, India might be able to acquire real-time data from Pakistan's military installations, and missile launch sites and constant coverage of military mobility inside Pakistan and along the borders may change the existing level of credible deterrence. Munir Akram, an ex-diplomat who had negotiated a treaty between India and Pakistan in 1987 to prohibit attacks on each other's nuclear facilities, claimed that any war between India and Pakistan would escalate uncontrollably may go nuclear quickly [63].

Some senior officers in Indian military had proposed a "Cold Start " to counter state-sponsored cross-border terrorism. However, it was not embraced by political leaders. Under this doctrine, if necessary, India can launch limited conventional military strikes below the threshold of a nuclear response. Scared of any conventional limited military strike, Pakistan reacted to India's Cold Start doctrine by changing its strategy from minimum credible deterrence to "full spectrum credible deterrence." Now, Pakistan is deploying tactical nuclear weapons against a conventionally superior India. Strategists argue that any such use of nuclear weapons in the battlefield has high risks of escalation from tactical to strategic level. By developing the short-range ballistic missiles, Hatf-IX (Nasr) with a range of 60 km, the vulnerability of strategic stability has increased. The first short-range ballistic missile Nasr got tested on July 21, 2011 [64]. General Khalid Kidwai, Advisor to National Command Authority, claimed at a conference on nuclear security that "India's larger military could still wage a conventional war against the country, thinking Pakistan would not risk retaliation with a bigger nuclear weapon." [65] The deployment of tactical nuclear weapons at operational level would always have an unreliable command and control mechanism. At the peak of the enemy attacks, a commander of nuclear arms unit in the battlefield would have the authority and less patience to launch tactical nuclear weapon on an overcoming adversary. One can imagine the scenario that such situation has less deescalation probability.

As India is pursuing its BMD Program, the pressure is building on Pakistan to respond to the full spectrum credible deterrence. On April 17, 2014, India tested its early-stage capabilities of a proposed 2-layered BMD system by successfully testing a Prithvi Defence Vehicle against a 2-stage target developed for mimicking an adversary's ballistic missile. The test was claimed to be successful countering a missile is coming from more than 2000 KM. "In an automated operation, radar-based detection and tracking system detected and tracked the enemy's ballistic missile. The computer network with the help of data received from radars predicted the trajectory of the incoming ballistic missile. The interceptor guided by high-accuracy inertial navigation INSsupported by a redundant Micro Navigation System moved toward the estimated point of the interception. All events were monitored in real time by Telemetry/Range Stations, at various other locations. The mission got completed, and the interception parameters were achieved" [66].

To assess the potential strategic consequences of military technological installments, the policymakers should take into account that South Asia is a sensitive region because of its geostrategic location, presence of 2 nuclear powers, interests of great powers, and emerging aggressive posture of India. Security dilemma has always been a hallmark of South Asian region, focusing on India-Pakistan relations. An Indian attempt to gain the status of regional policeman and a pursuit of power at international stage is increasing instability in the South Asian region. The strategic chain reaction is perpetual in case of South Asian regional dynamics. Any move made by China is responded by India, persuading Pakistan to take effective countermeasures, be it be conventional or nonconventional domain. Similarly, the extension of war theater from the traditional and conventional stand points to common boundaries in the space will cast a lasting impact over the strategic stability. Recent remarks by the President of the U.S. makes it obvious that space is becoming a fourth medium of warfare very soon. An expensive and unnecessary arms race in space will start in next to no time.

In case of South Asia, the history of strangulated relations and war history of the regional states have always compelled contenders to go for arms sophistication and buildup. Similarly, India's urge for great power status and prestige, along with the political environment and economic competition at the international level, resulted in the development of the Indian space program. At first, Indian space program has been primarily civilian in nature, focused on socioeconomic development, but now there have been evident changes leading to military use of space.

The former Indian President Abdul Kalam on the Golden Jubilee Celebration of the DRDO stated that they have the ability to intercept and destroy objects in space and will do it if it endangers Indian Territory [67]. In *India Vision 2020*, Kalam claimed that "Newly emerging technologies such as robotics or artificial intelligence

would have a crucial impact on future defense operations and also on many industrial sectors." [68]

Moreover, the DRDO is working on the Directionally Unrestricted Ray Gun Array and Kinetic Attack Loitering Interceptor [69]. Similarly, India is looking for a KE-ASAT, which could interdict hostile satellites. The DRDO is also planning programs such as development of an exoatmospheric kill vehicle, laser-based sensors, and minisatellites. Minisatellites will provide communication, navigation, and global positioning system services to armed forces of India.

India's space weaponization will have repercussion for Pakistan in particular and internationally in general. India already has conventional weapons superiority over Pakistan, and the space program will strengthen its strategic and military capability. Space domination will act as a force multiplier. Effective use of space satellite services will give India upper hand over an adversary or competitor. Thus, information domination will help India plan in a better way. It will strengthen India's reconnaissance and surveillance capabilities. It will provide India with accurate information about enemy missile silos, military buildup, and movement of troops [70].

India's intention to develop ASAT weapons will trigger a new and unnecessary space arms race. Moreover, putting weapons in space will destabilize the already vulnerable international nonproliferation regime. Space program can help India in their BMD system. V. Siddhartha, Indian scientist, claimed that India's Satcom, remote sensing, and weather satellites have contributed to its BMD and has provided these utilities as effective space control, force application assets, and ASAT weapons [71].

Despite these claims by Indian military officials that they have a reliable BMD system capable of killing potential targets in exoatmosphere and endoatmosphere, India's existing capacity is insufficient to change the fundamental strategic stability equation in South Asia, but it has disturbed the existing strategic balance. The geographical limitations and short distances between India and Pakistan may never allow the missile defense systems for perfection but the terminal phase missile interception. Another limitation of the missile defense system in India is that it is a big country, and it would require a significant number of short-range and long-range missiles. It would need a special budget allocation which would bring the huge cost for India with fewer benefits. Pakistan, on the other hand, would feel compelled by the circumstances to invest more resources in its ballistic missile system, space-based remote sensing systems, satellite-based radars, and communication satellites but with no promise of expected performance in real crises. The militarization of space for India and Pakistan would benefit less but would cost more in economic and strategic terms. A potential arms race in space would lead these countries toward more strategic instability, and economic oblivion, weak deterrence, and less security assurance except the more prestige and imitated technological superiority.

2. Conclusion

The Indian space program targets in the civilian domain for economic purposes, but it is drifting gradually toward militarization. Currently, with a 1.2 billion U.S. dollars annual budget, ISRO is a modest spacefaring agency with high technological potential. Increasing assets in space, the high growth rate of gross domestic product, and the U.S.-India nuclear deal have brought an opportunity for India to establish itself as a regional power and a major global player. Winning a seat at the United Nations Security Council would provide India a more considerable political influence to protect its regional and global interests. India is now in a transitional phase to augment its economic and political interests beyond the region and considers it essential to improve its nuclear deterrent and strategic capabilities. The Stockholm International Peace Research Institute reported in 2014 that India has imported 14% of global arms from 2009 through 2013 and is likely to grow in the coming years. It is more than any other country.

In the U.S.-India nuclear deal, military modernization is a prerequisite for which space capabilities have to be improved. India is looking forward to seizing this opportunity to establish a robust C4ISR capability. India's predominantly civilian space program traditionally provided little room for military utilities and security purposes. India looks for more investments in military-dedicated satellites and IGMDP to fill this gap. This inevitability of militarization is directly related to the changing strategic stability of the region. A chain reaction starts from the U.S., comes to China and India, and ends at Pakistan's space militarization and consequently a new arms race in the region. Pakistan's inability to compete with India in conventional and in military terms is causing great frustration and increased dependency on China. U.S.-India nuclear cooperation has worked as a knee-jerking factor for China-Pakistan economic and security cooperation. China-Pakistan Economic Corridor under the umbrella of Belt and Road Initiative is likely to change the scenario. It will give a push to Pakistan's sluggish economy and boost its defense procurement. China also intends to develop a maritime silk route using Gwadar port. It will enable China to have better access and control over the Middle East and Central Asia. China will use this naval base and deep water seaport as an alternate trade route to manage the political tensions over the Strait of Malacca. The deployment of Chinese submarines in 2008 at the base near Sanya on the southern tip of Hainan has increased tensions in India given this base is just 1200 nautical miles from Malacca Strait, the closest access point to the Indian Ocean. China's control over the Indian Ocean and a naval base at Gwadar will have profound strategic implications for India. The strategic angling of China-Pakistan and India-U.S. will define the security posture of the region in the near future. Amid close relationship, China will help Pakistan to launch more military satellites to improve ISR capabilities against India and may help it to acquire ASATs and missile defense system. In response, India would maximize space militarization efforts to deter both China and Pakistan by developing ICBMs, robust C4ISR, BMD system, and ASATs. One can foresee that this new regional security dynamics and technological asymmetries may translate into strategic instability among nuclear weapon states and pose more significant challenges for precarious regional peace and security.

Moreover, economic challenges faced by Pakistan will make it difficult for Pakistan to compete with India in this domain. Thus, low-intensity conflicts between India and Pakistan will increase. Dual use of satellites will strengthen India's security and economy. India is working on expanding its conventional and nonconventional military might, as is evident in its rising defense budget allocations.

Closer analysis of the issue suggests that historical relations between India and Pakistan and India's quest for space weaponization will make the security of the region fragile by undermining the deterrence stability of the region. The strategic balance will be shifted to the strategic advantage of India. Security dilemma generated by India in space will generate offensive and defensive reactions from its opponents and competitors.

It is concluded that to maintain stability at the regional and international level, it is mandatory that international community assert its efforts to put an embargo on the weaponization of the outer space and pay attention to developments taking place in this domain. At the regional level, peace and security in South Asia mainly depend on the nature of the relationship between India and Pakistan. Hence, efforts should be made at the regional level to have

confidence-building measures to ensure strategic stability and crisis stability. In the meanwhile, Pakistan should build up its space assets suitable to its needs and in the process bring in a level of space resource stability.

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