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India-US space cooperation: Implications for the South Asian strategic stability

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Abstract

India and US are cooperating in outer space domain since 1963. They agreed on "Next Step in Space Partnership (NSSP) and Defence Technology and Trade Initiative (DTTI)". America is strengthening Indian space capabilities by easily providing access to military space technology because China is the common threat that prompted them to cooperate. India became member of different export control regimes such as Missile Technology Control Regimes, Wassenaar Arrangements, and Strategic Trade Authorization Act-1. India-US Basic Exchange Cooperation Agreements and Indian membership of export control regimes are evident of the fact that India will become space hegemon in imminent future. India and US are having space cooperation to counter Chinese space rising posture, but it is also threatening space capabilities of Pakistan. Indian enhanced space capabilities and space situational awareness/intelligence prompted it to launch pre-emptive strike against Pakistan. This India-US space cooperation is having negative implications for South Asian strategic stability and resulted into exacerbating an arm race in South Asia and prompting Pakistan to collaborate with China. The purpose of the study is to understand How USA is assisting India in its space program? Why is India cooperating with USA in space domain? What will be implications of India-US space cooperation for the South Asia region? This research is using qualitative, descriptive and analytical research methodology.

Keywords: Indian space capabilities, missile technology control regime, Chinese space rising, South Asia, strategic stability, NASA, ISRO, NSSP, DTTI, Pakistan.

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1. Introduction

India and US are cooperating in outer space domain since 1963. In inception of this cooperation, America assisted India in setting up Thumba space station. America also assisted India in hurling its first rocket from Indian Thumba station in 1963. American firm procured a project to develop and hurl three INSAT satellites in orbit. India received remote sensing data from National Aeronautics and Space Administration (NASA)'s satellite. This satellite was renamed latter as LANDSAT. Chandrayaan-I Indian unmanned moon mission of 2008 was rudimentary element of India-US space cooperation to discover water's exitance on lunar surface (Indian Space Research Organisation, 2021). India and US are cooperating in myriad space aspects and areas including "space science, earth observation, satellite navigation, natural hazards research, disaster management support and education" (Lele & Sharma, 2014). The former President Obama and erstwhile Indian Prime Minister Manmohan Singh met in 2011 and agreed upon Joint Civil Space Working Group (JWG) for launching Lunar and Mars space mission and to explore space for benefit of society.

US and India are having myriad joint statements and strategic agreement to ameliorate the strategic cooperation. These agreements include "Next Step in Space Partnership 2004 (NSSP), New Framework for India-US Defence Relationship 2005, India-US civil nuclear deal 2005, Defence Technology and Trade Initiative (DTTI), Joint Strategic Vision for Asia-Pacific and IOR etc" (Goswami, 2020). US and India increased their civil space cooperation through US-India Joint Working Group (JWG). NSSP pertained to civil space cooperation. US and India conducted three space security dialogues (i.e., 2+2 dialogues of 2018, 2019 and 2020), and both states are having JWG for Mars and lunar space exploration. Furthermore, India and USA signed BECA and are also member of QUAD collaboration.

India-US space cooperation is enhanced to counter the Chinese rising influence in the space and in the India-Pacific region. China tested its ASAT capability in 2007 and since then India felt threatened and tried to take measures to counter this threat. India established "integrated space cell" to curb the security threat. India tested its ASAT capability in March 2019 to balance the Chinese ASAT threat. Rajeswari Rajagopalan claimed that Indian ASAT test is the reaction to Chinese ASAT to balance the space arm race in the region (Goswami, 2020). China is considered as the common adversary by both USA and India. Their cooperation to counter Chinese space influence is having negative implications for South Asian strategic stability. Their cooperation is exacerbating space race in South Asian region. American efforts to strengthen India capabilities (by providing membership of MTCR, WA, STA-1, its 2+2 dialogues and BECA agreement) threaten Pakistani security.

The research problem is that India and US are having space cooperation to counter Chinese space rising posture, but the problem is that it is threatening space capabilities of Pakistan. Indian enhanced space capabilities and space situational awareness/intelligence prompted it to launch pre-emptive strike against Pakistan. This India-US space cooperation is resulted into exacerbating an arm race in South Asia and prompting Pakistan to collaborate with China. The purpose of the study is to see How US is assisting India in its space program? Why is India cooperating with USA in space domain? What will be the implications for India-US space cooperation for the South Asia region?

The significance of the study is that this research is exploring the most neglected side of the

interstate relation and its regional impacts. Space is the emerging field and consider as the fourth medium of warfare. But the scope of military use of outer space in Pakistan is limited. Pakistan is having civilian space program only. But its adversary India is having well established military space program, especially in the aftermath of its acquiring space weapon and the testing of its ASAT test. The research design of this study is qualitative approach where descriptive and analytical research methodology is used. The organization of the study includes different sections such as introduction, literature review, theoretical framework, Indian membership of MTCR and its implications for South Asia, India and the Wassenaar Arrangements, Indian STA-1 status, BECA and its implications for South Asia, Communications Compatibility and Security Agreement (COMCASA), QUAD and space cooperation, Prospects for India-US space cooperation, Implications of India-US space cooperation for South Asia and Policy options for Pakistan.

2. Literature review

India-US first 2+2 agreement was signed on September 6, 2018, in New Delhi and second 2+2 ministerial dialogue held in December 2019 in Washington DC. The second 2+2 joint statement emphasized on their shared leadership role in space. Third India-US 2+2 dialogue was held in October 2020 that resulted into signing BECA. On the 50th ISRO's and Apollo 11 mission's anniversary, India and US agreed to augment space synergies in earth and lunar exploration domain. NASA and ISRO are cooperating to manufacture "NASA-ISRO Synthetic Aperture Radar (NISAR) satellite" that is expected to launch in 2022 to "monitor floods, glacial changes and soil moisture" (US Embassy and Consulates in India, 2019). They decided to launch a joint human space mission, Space Situational Awareness (SSA) information sharing to increase the safety, security, and stability in space arena and to have space defence cooperation in 2020.

Trump visited India from in February 2020 and appreciated Indian lunar exploration, Chandrayaan mission and offered his willingness to enhance space cooperation between both states. Times of India elucidated that both states signed an agreement through which India is bound to share the images from moon mission to NASA. They are running Artemis program to "put astronauts on the moon again by 2024". Chandrayaan-2 mission arrived on moon in 2019 and captured photographs. Later the Vikram lander machine was crash-landed, and India faced biggest loss from its second lunar mission. Chandrayaan-1 mission explored the presence of ice-water on moon in 2009 and the information was shared with NASA. Chandrayaan-3 is in manufacturing phase that is expected to launch by 2021 (Howell, 2020).

US based Boeing and Raytheon companies are cooperating with ISRO. Raytheon and ISRO signed the agreement to produce and provide "ground-based GPS system and GEO Augmented Navigation Technology Demonstration System (GAGAN-TDS)" to India (Siddiqui, 2020). GAGAN-TDS is the space-based civil navigation satellite. Trump's visit resulted into long-term space cooperation in the form of "Moon landing and robotic Mars exploration missions". US agreed to provide "Integrated Air Defence Weapon System (IADWS)" to India for $1.9 billion in February 2020. US undertook steps to constitute a separate space force and India followed it by launching its own Space Defence Agency (SDA). In September 2019, the heights of India-US space cooperation were disclosed in these words; "American created US space force and are closely cooperating and working with India in space to be the pioneers of new frontiers in space to uphold values, defend liberty, control the destiny, and raise the sights of humanity" (Goswami, 2020).

3. Theoretical framework: Balance of power theory

Balance of power is the "policy of a state to protect itself against another nation by matching its power against the power of the other side" (Britannica, 2020). Kautilya, the minster of Mauria dynasty at Taxila, in his writing Arthashastra focused on the concept of balance of Power needed for survival. Theory of Structural Realism emphasizes on the anarchic international system. There is anarchy in international system; and the aim of states is to seek security, dominance and survival through power without disturbing "Balance of Power". The threat comes from other states that lie in close proximity; their intentions and aims are aggressive and they possess offensive capabilities. Close proximity is justified not only on the basis of geography but with the advent of nuclear and space age every state includes in close proximity (Elman, 2007). "Balance checkmates offence" is the key concept of this theory (Mearsheimer, 2001). Balancing can be possible through two ways such as internal balancing or external balancing. Internal balancing is possible through building state's own military capabilities and arsenal. External balancing is possible though making alliances and getting military equipment and technology from allied/ partner states.

The "Balance of threat theory" emphasis on balancing through formation of alliances as a mean to protect from aggressor state in anarchy (Elman, 2007). In the time of conflict, the urgent decision of victim state is to go for balancing through alliances against aggressor and afterwards increase their capabilities and power. Excessive power creates security dilemma. Wolfer in his writing security dilemma comes to the conclusion that security dilemma produces worst scenario and lefts states in permanent situation of uncertainty and quest for "appropriate amount of power" is apropos (Elman, 2007). Joseph Grieco's term of "defensive positionalist" focuses on the defensive role assign to state (Donnelly, 2005). The objective of states is to minimize the gap that favours other state through alliance or enhancing power.

Balance of Power theory is applicable in the situation. India is making alliance with US to balance the Chinese increasing power in space realm. China is rising space power and the second most powerful space power after USA. China tested its ASAT test in 2007 and US in reaction tested its ASAT capability in 2008. India also tested its ASAT capability in 2019. According to BOP theory, India is having two choices, first is to opt for internal balancing by building own capability and second is to make alliance with US. India felt threatened because of the rising Chinese space power capability and decided to avail both options. It is developing its own space capabilities and it also joined hands with US to take assistance and capabilities. US assisted India to become member of different export control regimes such as MTCR, WA and AG. US also provided the STA-1 status to India and both states negotiated 2+2 dialogues as well. Because of this support India can easily get advance military technology that will assist it to strengthen its space program.

4. Research methodology

Qualitative research methodology is used in this article. Deductive approach is used, and the balance of power theory is used in this research. Secondary data is used which contains material from books, research journal articles, newspaper articles, website material, reports, magazine articles and material from online sources such as Google scholar, Google, ISI Web, online libraries, HEC digital library, and Wiley online library. Descriptive and analytical research technique is used.

5. Analysis and discussion

5.1. Indian membership of MTCR and its implications for South Asia

India became member of Missile Technology Control Regime (MTCR) on June 27, 2016, that is assisting India in ameliorating its missile program, because this membership easily provided hi-tech missile technology to India. India was granted membership of MTCR without dismantling existing ballistic missile (BM) technology because US made this exception for India. India is considered as non-Nuclear Weapon State (non-NWS) or not-recognized NWS and permitted to retain BMs. India after MTCR membership received technology without fear of sanction. India is getting "Category-1 UAVs like Reaper, Global Hawk and Predator drones, which the US has employed for reconnaissance and counter-terrorism" (Jalil, 2017). Indian offensive capabilities would increase after acquiring aforementioned technologies form USA. It could launch cross boarder strike that would threaten Pakistan's national security. India will get access to Israeli Arrow-II missiles for its missile defence system that will exacerbate arm race in South Asia. India being member of MTCR will get advance missile technology that will augment its missile, space and nuclear program and will lead to unequal military capability amid India and Pakistan, which will intensify arm race in South Asia.

MTCR membership provided India access to BMD system, ASAT capability and ICBM and cruise missiles to modernize its defence sector. Indian is getting Israeli Arrow-2 BMD systems and Russian S-400 BMDs. It has augmented its BrahMos cruise missile and Agni series because the membership of MTCR equipped India with hi-tech military technology to modernize its military sector. Membership of MTCR open the avenue for India to import "German and British propulsion airframe to improve its existing cruise missile technology and develop new missile as well. The likeliness of Indian and western companies for developing missile technology is evident that will increase weapons stockpiles and Indian arms export would also boost. For instance, India is currently enhancing its sale of BrahMos cruise missile that was manufactured cooperatively with Russia. India is exporting it to Vietnam and 15 more states. These Indian exports will destabilize regional stability and will increase arm race in the region that would lead to security dilemma. Indian membership of this regime enhances its prestige and international stature. Furthermore, the prospects of getting membership of Nuclear Supplier Group (NSG) will be enhanced. Succinctly, Indian membership of MTCR is not restraining arm race, instead, it is aggravating the existing strategic stability in South Asia. It is assisting member states to get access to missile technology to augment and upgrade their missile, space and nuclear programs. US metamorphosed the terms and conditions of the MTCR and made the sale of drone technology easy (Bano & Kazmi, 2020). Arm import-export of member states will boost up that will emanate insecurity in neighbouring states, and they will be forced to follow the pursuit to strengthen their defence and survival.

5.2. India and Wassenaar Arrangement (WA)

Membership of WA bestowed to India on December 08, 2017 enabled India to acquire dual use of military technologies that other non-member states are proscribing to access. It is permitted to sell indigenously developed military equipment and nuclear reactors without contravening international community. India being member of WA will import and export all items existing in control list including aircrafts, sea-vessels and other munitions. India is having exemption for providing licenses for purchasing these items, which non-member states cannot

acquire (without license). India being member of WA can easily transfer technology to other states (Rajagopalan & Biswas, 2016). Indian imports and exports of military technologies undermine the regional strategic stability and instigated a new arm race (Sudarshan, 2017). Being member of WA India is permitted to modernize its military sector at fast pace. Indian space program is getting mature and advance because of membership of this program. Indian advanced space program and testing of ASAT technology in March 2019 is evident of its ambitions of procuring space control to uphold its influence, power and hegemony in terrestrial, regional and outer space domain. Indian space weapons build-up endangered existing space capabilities of different states (such as China and Pakistan) in outer space and instigated other states (e.g., Pakistan) to follow the pursuit. The ASAT technology of USA, Russia, China and India anticipated the weaponization of outer space that will lead to space-based and cyber conflict (Rashid *et al.*, 2021).

5.3. Indian Strategic Trade Authorization-1 (STA-1) status

Strategic Trade Authorization (STA) is license exemption status provided by USA to any state which is NATO ally and member of all four export regimes (i.e., NSG, WA, MTRC and Australia Group (AG)), and permitting it to import dual use sensitive hi-tech military, defence and space technology from USA, without providing transaction-specific license. STA exemption is related to export, transfer and re-export of technology to member state (Pakistan Today, 2018). India became 37th state who acquire status of STA-1. Previously India was having STA-2 status. STA-1 status gave India full and high-level exemption for importing all enlisted items. China, Russia and Pakistan have not been provided with the STA status that is emanating conventional and unconventional military disparity in the region and aggravating regional stability and ameliorating arm race in region. US Department of Commerce assigned STA-1 status to India on July 30, 2018 and was designated it the third Asian state after South Korea and Japan having this license exemption status to access military high-tech. India is neither NATO ally nor member of NSG. It is only member of three export regimes including WA, MTCR and AG, however, bestowed with the STA-1 status by USA because USA made exemption for India and declared India the first state having STA-1 status which yet has to be member of NSG. India previously succeeded in attaining NSG Waiver in 2008 (Khalid, 2018). American waivers paved the way for India in acquiring NSG membership. Thought previously, India tried to be member of NSG, but China objected and declared its plea void.

STA-1 status provides India "AH-64E Apache Guardian attack helicopter, armed drones, fighter jets like the F-35 and the Stealth bomber, protection equipment like body armour and tear gas; materials related to nuclear power development; explosives detection and disposal" (Ahmed, 2018). Richard Rossow illustrated that "India seeks to develop an indigenous defence manufacturing industry, being able to import equipment used in creating specialty alloys, lighter frames, minimizing radar visibility, etc" (Ahmed, 2018). India and USA were having trade of $ 15 billion in last decade that will probably increase after giving STA-1 to India. Zafar Nawaz Cheema in a conference in Strategic Vision Institute proclaimed that STA-1 will provide India excessive access to military technology including "Electromagnetic Aircraft Launch System, an armed version of Guardian Drones, and NASAMS-II, which is a multi-tiered air defence network featuring 3D mobile surveillance radars and missile launchers" (Pakistan Today, 2018). India and USA are having strategic bilateral cooperation to counter China, but USA is stipulating India to refrain from purchasing five S-400 MD system from Russia. US Offered "Terminal High Altitude Area Defence (THAAD) Air Defence System and

Patriot Advanced Capability (PAC-3) missile defence systems to India as Alternative to Russia's S-400 in May 2019". India is also interested in THAAD system. India in this situation, can neither leave US cooperation nor want to abandon Russia partnership (Abro, 2018).

STA-1 status is important for India because it entitled India to get technology related to "electronics, lasers, and sensors, information security, computers and electronics, navigation, telecommunications, aerospace, chemical and biological weapons and nuclear technology etc." That will assist Indian nuclear and space program to strengthen its national security and nuclear non-proliferation stature. STA-1 status will augment Indian missile capability. "Westinghouse Electric Company work" has decided to provide "six AP 1,000 nuclear reactors in India". Succinctly, STA-1 status will supplement Indian with "high-tech space, military, strategic, and commercial trade transfers" that will enhance arm race in South Asia and negatively impact South Asian regional strategic balance (Pakistan Today, 2018). This US endeavour entails and manifests closer bilateral defence ties and trade with its strategic partner India to serve its geopolitical goals to counter Chinese hegemony in Indo-Pacific region. Indian military modernization being member of STA-1 will be having implications for Pakistan. It will emanate security dilemma and strengthen arm race in South Asia. It is best possible solution for Pakistan to have defence cooperation with Russia and China to sustain strategic balance in the region (Khalid, 2018; Muzaffar, 2017).

5.4. Communications Compatibility and Security Agreement (COMCASA)

India and USA agreed upon secure bilateral military "Communications Compatibility and Security Agreement (COMCASA)" that was signed on September 06, 2018, to provide India with (secure) communication (and data) security equipment. This capability offered India secured data links and communication technology. These bilateral India-US agreements are having serious implications for Pakistan because these technology transfers from USA to India is disrupting strategic balance in South Asia (Smith, 2018).

5.5. Basic Exchange Cooperation Agreement and its implications for South Asia

Indian Defence Space Agency (IDSA) was formulated in May 2019 to ameliorate its military space program. US wants to maintain global hegemony and consider China as a challenger to its position. In order to counter Chinese rising power, US is developing close military ties with India (Khatoon, 2018). India-US strategic partnership is significant and was evident at different instances. Firstly, India was declared as the major American defence partner in the "Section 1292 of the National Defence Authorization Act of 2017" (US Congress, 2016). Secondly, Asia Reassurance Initiative Act of 2018 and US-India Enhanced Cooperation Act of 2019 emphasized on the increase in the India-US defence, security and technological cooperation (US Congress, 2018). Thirdly, India-US joint statement of 2020 resulted into enhancing space cooperation in the form of "space situational awareness, military space cooperation, intelligence sharing, co-development of equipment, and personnel training" (Giri, 2020). US and India inked three other agreements before signing BECA. These includes "General Security of Military Information Agreement (GSOMIA) of 2002"; "Logistics Exchange Memorandum Agreement (LEMOA) of 2016", and "Communication Compatibility and Security Arrangement (COMCASA) of 2018". In short, US in space domain agreed on BECA and in maritime domain USA instigated "Quadrilateral Alliance". India, USA, Australia and Japan are the member states of this alliance. Before QUAD and BECA, Obama administration

gave the "Pivot to Asia" policy that resulted into "transfer of 60% of US naval and air power in the Asia-Pacific region". Later on, Trump administration inflicted trade sanction against China (Bano & Kazmi, 2020).

India-US space defence cooperation resulted into signing of the Basic Exchange Cooperation Agreement (BECA) (during the third 2+2 dialogue) on October 27, 2020, to enhance the geospatial intelligence. National Geospatial-Intelligence Agency of the US Department of Defence and India's Defence Ministry agreed to share intelligence under BECA. The information is in the form of "advanced satellite and topographic data such as maps, nautical and aeronautical charts, geodetic, geophysical, geomagnetic, and gravity data". This "satellite data, critical geospatial information, and topographical data can be used for long-range navigation and missile targeting" by India. Indian "wider-network of high-fidelity and low-latency communication, and high-resolution remote-sensing and navigation capabilities" will assist it to secure its regional national interests. BECA is also providing "high-quality GPS for military systems to navigate" and provides real-time intelligence to missiles. However, US is not allowed to share this information with any third party especially Pakistan. This geospatial intelligence will enhance accuracy of Indian ballistic, cruise missiles and drone technology. India is already using American "C-17 Globemaster III for military transport, Boeing's Chinook CH-47 as heavy-lift helicopters, Boeing's Apache as tank-killers, P-8I for overland reconnaissance, and Lockheed Martin's C-130J for airlifting troops".[1]

American objective is to counter China, but Indo-US agreements are improving Indian military space capabilities. Succinctly, Indo-US strategic partnership is menacing South Asian strategic stability. BECA aimed to counter Chinese threat but can be used against Pakistan. Intelligence sharing under BECA will assist Indian ASAT and hypersonic capabilities. The space situational awareness information will prompt India "to conduct pre-emptive strike, offensive military operations or aerial surgical strike against Pakistan" (Bano & Kazmi, 2020). There is a possibility that India could use this space situational awareness intelligence in a "counterforce nuclear or conventional attack against Pakistani strategic instalments and assets. Indian hypersonic weapon is having short flight time and it can be used to counter Pakistani Nasr capability. It is suggested that Pakistan needs to enhance its space cooperation with China and to strengthen its civilian and military space program to lessen the gap between Indian and Pakistani space program.

5.6. QUAD and India-US space cooperation

India, US, Japan and Australia are the QUAD members, and their cooperation is extended into the space domain. ISRO fully manufactured synthetic aperture radar (SAR) in March 2021. SAR is developed to capture high-resolution images. ISRO formulated the S-band SAR and want to integrate it with (American) L-band SAR. So, it transferred its manufactured radar to NASA laboratory on March 4th, 2021. "NASA-ISRO Synthetic Aperture Radar (NISAR) satellite, an earth observation project is under construction and expected to complete in 2022-23. NISAR is also using L and S-band radar system. It can easily locate and distinguish the surface and ice-covered areas. Radar images are significant enough to analyse the transforming trends in croplands, and hazards i.e., floods, droughts, volcano spread etc. NISAR project provides India with different types of technologies such as L-band SAR, GPS services, communication system. However, on other hand, ISRO will provide the S-band SAR, launching vehicles and services. It is planned that this project will be launched from

"Sriharikota spaceport in Andhra Pradesh, India" by using "Geosynchronous Satellite Launch Vehicle (GSLV-II)". ISRO is paying $110 million, and NASA is paying $808 million for this project (Rajagopalan, 2021).

Space is a no man land where spacefaring states are competing and trying to maintain their dominance. US and China are the two biggest space competitors in space realm. US is trying to counter Chinese space hegemonic role by strengthening Indian space capabilities. China considers space control doctrine and its counterspace capabilities aimed at strengthening its national interests but US and its allies consider these Chinese capabilities as menace to their space capabilities. For instance, Chinese ASAT test conducted on 2007 threatened USA and India. In reaction, American and India conducted their ASAT test in 2008 and 2019 respectively. USA announced its Defence Space Strategy in 2020 to "prioritize integration of combined operations and deterring aggression". Gen John Raymond is the Chief of Space Operations in the United States Space Force, gave a statement that "Our allies help us to retain space superiority and provide a stronger foundation for combat effectiveness." The integration of combined operation involves "information sharing, aligning policy, expanding research and development, integrating operations, exercises, and intelligence activities" amid Quad members (Diehl, 2021).

5.7. Prospects for India-US space cooperation

India-US has possibility of more space cooperation in myriad domain. Firstly, US and India can agree on shared space vision to enhance industrial space development for developing EO satellites for enhancing surveillance and remote sensing capability in IOR. Secondly, "US space command and Indian SDA" implies SSA agreement and can exchange space personals. Thirdly, they would continue joint robotic moon exploration program. Chandrayaan-3 was planned to launch in 2022 on the South-pole of the moon. India and Japan agreed to send the resource protector mission to moon to establish a base from 2022-24. Likewise, India can continue to collaborate with USA in moon mission. Fourthly, NASA and ISRO established a JWG for Mars exploration and will continue to pursue joint Mars exploration program. NASA provided Indian Mars Orbital Mission (MOM) with the navigational and commercial assistance. NASA's MAVEN and ISRO's Mangalyaan (also termed as MOM) separately arrived on Mars in September 2014 with the difference of two days. MAVEN and MOM were coordinating since the establishment of Mars working group.

Fifthly, they can cooperate to have space nuclear propulsion and power system. China announced to develop "nuclear-power space shuttle for its Mars mission. India and US are having small nuclear reactors. They are having expertise in fusion propulsion system. They are cooperating in "International Thermonuclear Experimental Reactor (ITER)". It is likely that in future they would develop "space fusion power and propulsion" system to instantly reach the stars. Sixthly, they cooperate to equip India with space-based "electronic, signals, and cyber intelligence capability". Lastly, it is plausible that both states will cooperate for orbital power station to balance Chinese solar power satellite technology. In 2011, ex-president Kalam anticipated to have a US-India joint space-based solar power system. Potentially, this cooperation will be ensued because currently, energy security is the backbone of India-US relations. The heights of Indo-US space cooperation would result into Indo-US Space vision. Already both states agreed on Indo-US civil nuclear cooperation and India-US Indo-Pacific vision. The next step would be the Indo-US space vision agreement (Goswami, 2020).

5.8. India-US space cooperation in South Asia and policy options for Pakistan

India-US space collaboration is having serious implications for South Asian region. Indian membership of MTCR provides it with UAVs, drones technology, BMDs, ASAT and ICBMs. India also purchased Israeli Arrow-2 BMD systems and Russian S-400 BMDs and augmented its Agni and BrahMos cruise missile. These enhanced offensive capabilities increased the risk of Indian cross boarder strikes against Pakistan. India MTCR membership resulted into unequal distribution of capabilities that exacerbated an arm race in South Asia and will disturb regional stability and security. India being member of Wassenaar Arrangements can easily import and export dual use military technologies, aircrafts and naval technologies that is also undermining regional stability and generating an arm race in South Asia (Sudarshan, 2017).

Indian STA-1 membership is a source of concern for neighbouring states. Because this membership will provide India access to "Electromagnetic Aircraft Launch System (EALS), air-defence system, missile launchers, helicopters, drones, F35 jet fighter, radar technology, lighter frames, electronics, lasers, sensors, bombers, and technologies related to information security, computers and electronics, navigation, telecommunications, aerospace, chemical and biological weapons and nuclear technology etc". These technologies will enhance Indian military capabilities and generate an arm race in the region. Basic Exchange Cooperation Agreement (BECA) provides India geospatial intelligence technology that will assist it to accurately target the enemy's strategic assets.

India and US are cooperating to counter Chinese growing power but American assistance to India is strengthen its military capabilities that will pose threat to the Pakistan's national security. Indian enhanced military capabilities will provoke it to make pre-emptive strikes against Pakistan. These agreements have generated insecurity in other regional states of South Asia because American is pouring immense military technological in India that is creating imbalance of power in the South Asian region. This situation is resulted into an unending arms race in South Asia that will lead to the security dilemma and will destabilize South Asia strategic stability. The policy options available for Pakistan are of two sorts. First is to build its capabilities internally. Second is to build capabilities externally by cooperating with China and Russia to decrease imbalance of power in South Asia especially in the aftermath of Indian membership of these agreements.

6. Conclusion

India-US space cooperation aimed at countering Chinese increasing space power stature. India became member of MTCR, WA, and STA-1 with the assistance of US. Both states are having immense civilian and military space cooperation. India and USA agreed upon BECA and QUAD. Indian space program is strengthened in the aftermath of these initiatives that is posing threat to the Pakistan's security because it is difficult to rebuff the chance that India will launch an offensive pre-emptive strike against its neighbours especially Pakistan. Indian membership of these regimes and agreements is creating imbalance of power in region and resulted into an unending arms race in South Asia and prompting Pakistan to collaborate with other spacefaring states to enhance its space and military capabilities. Succinctly, it is evident from the above-mentioned literature that Indo-US space cooperation is having negative impacts for South Asian strategic stability.

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Note:

[1] The US has one of the largest defence satellite networks which includes spy satellites, GPS satellites, and other specific intelligence satellites such as Communication Intelligence (COMINT) and Electronic Intelligence (ELINT) satellites. These satellites continuously provide the US with immense amounts of geospatial data which can give minute-by-minute updates on military movements anywhere in the world. With BECA this data would be available to India.