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Politics of Nuclear Competition in South Asia: Motivations and Compulsions

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Abstract:
South Asia is an important region of the world politics due to various factors, inter alia, the presence of nuclear weapons in the hands of two major rivals, India and Pakistan. Although, the nuclear doctrines of both countries officially announce to have adopted 'minimum credible deterrence'; yet, both have been engaged in increasing their nuclear and missile inventories to new levels, leading to continuous arms race in the region. After two decades of the nuclearization in the region, it is pertinent to assess what role did nuclear weapons play in the security of India and Pakistan, what has kept the two nuclear arch rivals of South Asia into an unabated nuclear and missile arms race? The authors have suggested various implication of the ongoing arms race in the region and have proposed a peaceful resolution of bilateral disputes to move forward.

Keywords: South Asia, Nuclear Competition

I. Introduction

India and Pakistan are known as the nuclear arch rivals who acquired nuclear weapons in 1998. India tested nuclear weapons on May 11 and 13, 1998 and professed that it acquired nuclear weapons due to growing threat from China and Pakistan (Cohen & Dasgupta, 2010). Conversely, it is also argued that India's nuclearization is driven by prestige rather than security imperatives (Sultan, 2019). India attained the weapons technology in 1974 by conducting the so-called Peaceful Nuclear Explosions termed as 'Smiling Buddha'. Indian acquisition of nuclear weapons defied the international norms of nuclear non-proliferation and spurred debate of proliferation in 'second nuclear age.' In reaction to India's nuclear weapon test in 1998, Pakistan tested its nuclear weapons on May 28, 1998 to maintain the balance of power claiming that its nuclear weapons program was India centric and is meant for defence purpose only. It was hoped that nuclear weapons would prove to be a catalyst for peace and stability in the Indo-Pak relationship. But, both the states have been engaged in five crises situations between 1998 and 2019; first in 1999 at Kargil, second in 2001-02 (Operation Parakram), third in 2008 after Mumbai attacks, fourth in 2016 in the aftermath of Uri attack (that was an Indian so-called surgical strike) and fifth, the Pulwama attack and ensuing crisis in February 2019. Both countries being nuclear armed states were engaged in persistent tensions during these crises having varying timelines. Both did not engage in a full-fledged war due to the presence of nuclear weapons thus, it seems that nuclear deterrence worked between India and Pakistan to keep them away from conventional war too. Apart from nuclear deterrence the United States(US) also played important role in defusing the Kargil crises of 1999, border stand-off 2001-02, and Mumbai crisis 2008 (Yousaf, 2018). Both, the nuclear deterrence and international mediation played effective role in defusing the crises.

When India and Pakistan acquired nuclear weapons, both declared to adopt 'minimum credible deterrence' policy (Swaran Singh and Bhumitra Chakma , 2011) that posited that both countries would avoid indulging into the Cold War like arms race. However, both the states have been developing and modernizing their nuclear and missile capabilities. A report of *Bulletin of Atomic Scientists* published in 2018 claimed that Pakistan possesses about 140 to 150 warheads and the country's stockpile can grow to 220 to 250 warheads by 2025, if the current trend continues (Hans M. Kristensen, Robert S. Norris & Julia Diamond, 2018). It is assessed that India has a weapon-grade plutonium that can be used for developing around 150-200 nuclear weapons but it might have developed 130-140 nuclear warheads (Hans M. Kristensen & Matt Korda, 2018). The growing number of nuclear and missile race in South Asia has raised questions regarding nuclear arms race by various proponents of nuclear non-proliferation. Therefore, this study tries to address such concerns by parting it into four sections. First section assess the Indian nuclear forces; second section analyses Pakistan's nuclear forces; third section evaluates why India and Pakistan are entangled into an unabated arms race; and fourth section suggests the implications of the arms race for deterrence stability in South Asia.

II. India's Nuclear Forces

India possesses a variety of nuclear weapons delivery systems. It has completed a nuclear triad. Its nuclear delivery systems include aircraft carriers, ballistic and cruise missiles and nuclear capable submarine. An appraisal of India's nuclear strike forces is given below.

A. Aircrafts

A report by *Bulletin of Atomic Scientists* claimed that India has three or four squadrons of Mirage 2000H Vajra "divine thunder" and Jaguar IS/IB Shamsheer "sword of justice" aircrafts, at three air bases. They are assigned nuclear strike missions against Pakistan and China. The Mirage 2000 is undergoing modernization and its upgraded version is Mirage 2000I (Hans M. Kristensen & Matt Korda, 2018). The Mirage 2000 is French made multirole fighter jet. Its Hindustani variant is known as Mirage 2000h (H stands for Hindustan). The Jaguar IS/IB is known as The SEPECAT Jaguar which is a British-French jet attack aircraft and can be used for tactical nuclear strike roles. Along with upgradation of existing aircrafts, India is also seeking addition of new aircrafts to supplement its strike force capabilities. India struck a deal for 36 Rafael fighter jets from France in 2016 at a cost of €7.87 billion (India, France ink €7.87 billion agreement for 36 Rafales, 2016). The deal also aroused political controversy within Indian political parties over high prices. The Rafale is a twin-engine, multi-role fighter aircraft. According to Dassault, its manufacturer, its specifications include air defence, interception, ground support, in-depth strikes, reconnaissance, anti-ship strikes and nuclear deterrence (India, France ink €7.87 billion agreement for 36 Rafales, 2016).The aircrafts will be delivered between September 2019 and April 2022. The new fighter jets will be deployed in two equally-sized squadrons; one at Ambala Air Base Station which is located only 220 kilometers from the Pakistani border and the other at Hasimara base in West Bengal (Hans M. Kristensen & Matt Korda, 2018).

B. Land-based missiles

There are four types of land-based missiles in India's missile inventory. Prithvi-II and Agni-I are the short-range missiles, Agni-II serves as the medium-range missile, and Agni-III serves as the intermediate-range missile. India is also eying to develop the Agni-IV and Agni-V which are able to cover very long distance (these missiles are also known as inter-continental ballistic missile) (Hans M. Kristensen & Matt Korda, 2018). Prithvi II can carry conventional or nuclear weapons to a range of 250 Km. It was inducted in India's Strategic Forces Command in 2003. The missile was developed by India's Integrated Guided Missile Development Program (Indian Ministry of Defence, 2013). Agni I is a two-stage, solid-fuel, road-mobile that was inducted into operations in 2007. The missile can carry nuclear or conventional warhead and has a range of approximately 700 kilometres. The missile is considered as Pakistan specific (Subramanian, The significance of Agni-I, 2002). Agni II is a two-stage, solid-fuel, rail-mobile missile that can deliver a nuclear or conventional warhead with a range of more than 2,000 kilometres. There are around 10 launchers of this missile system. Likewise, the Agni-III is two stage, solid fuel, intermediate-range ballistic missile. It is capable of delivering a nuclear warhead more than the range of 3,200 kilometres. It has also around 10 launchers (Ballistic and Cruise Missile Threat, 2017). Agni-IV is a two-stage, road-and rail-mobile intermediate range ballistic missile with the capability to deliver a single nuclear warhead up to 3,000 kilometres. However, this system may not be operational yet. (Subramanian, Agni-IV test-flight a 'stupendous success', 2016). Agni-V is an Intercontinental ballistic missile (ICBM), having a range of around 5000 Km and covering almost all areas of China. It is a three-stage, solid fuel, rail-mobile launch missile capable of delivering a nuclear warhead (Bedi R. , 2012). The missile is yet to get operational. India has also developed a ground launched cruise missile, *Nirbhay*with a range of about 700 Km. It was tested in 2017 and aimed at low-altitude flights to evade enemy radar system (Pundit, 2017). The country tested *Prahaar* missile in 2011, the same year when Pakistan tested its short-range *Nasr* missile also considered as Pakistan's 'tactical nuclear weapon'. India's *Prahaar* would replace the *Prithvi-I* missile. It is categorized as 'tactical nuclear weapon' in India's missile system that has a range of 150-300 Km. (Does India have a Tactical Nuclear Weapon?) and (India successfully test-fires Prahaar missile, 2011).

India is also developing its Ballistic Missile Defence (BMD) system to ensure survivability of its second-strike capability. The BMD system have two tier systems including the *Prithvi* Air Defence (PAD) missile and the *Ashwin* Advanced Air Defence (AAD) which got initial trials in 2006 and 2007. The Indian DRDO claims that it has been successful in engaging targets within 2000 Km and they aim to work on developing missiles to tackle targets within 5000 Kms (Rajagopalan, 2017). India has carried out strategic partnership for space cooperation with the US, Israel and Russia in achieving optimum results of its BMD system. It has struck a deal with Russia for getting S-400 missiles in October 2018 for air defence system (India, Russia formally ink the $ 5.2 billion deal for S-400 air defence system, 2018). The following chart shows the existing nuclear and missile capabilities of India.

Table 1

Type	NATO designation	Number of launchers	Year deployed	Range[a] (kilometers)	Warhead x yield (kilotons)	Number of warheads
Aircraft						
Vajra	Mirage 2000H	~16	1985	1,850	1 × bomb	~16
Shamsher	Jaguar IS/IB	~32	1981	1,600	1 × bomb	~32
Subtotal:		~48				~48
Land-based ballistic missiles						
Prithvi-II	n.a.	~24	2003	350[b]	1 × 12	~24
Agni-I	n.a.	~20	2007[c]	700+	1 × 40	~20
Agni-II	n.a.	~8	2011[d]	2,000+	1 × 40	~8
Agni-III	n.a.	~8	2014?	3,200+	1 × 40	~8
Agni-IV	n.a.	n.a.	(2018)	3,500+	1 × 40	n.a.
Agni-V	n.a.	n.a.	(2020)	5,200+	1 × 40	n.a.
Subtotal:		~60				~60[e]
Sea-based ballistic missiles						
Dhanush	n.a.	2	2013	400	1 × 12	4
K-15	(Sagarika)	(12)	(2018)	700	1 × 12	(12)
K-4	n.a.	(4)	?	3,500	1 × ?	0
Subtotal:		(18)				(16)
Total						**130–140**[f]

[a]Range listed is unrefueled combat range with drop tanks.
[b]US NASIC has estimated the range as 250 kilometers (155 miles) but we assume the range has probably been increased to about 350 kilometers (217 miles) as stated by the Indian government.
[c]Agni I first began induction with the 334th Missile Group in 2004 but did not become operational until 2007.
[d]Agni II first began induction with the 335th Missile Group in 2008 but did not become operational until 2011.
[e]The missile and warhead inventory may be larger than the number of launchers, some of which can be reused to fire additional missiles. This table assumes an average of one warhead for each launcher.
[f]In addition to the 124 warheads estimated to be assigned to fielded launchers, warheads for additional K-15 SLBMs, Agni-III MRBMs, and future Agni-IV MRBMs may already have been produced for an estimated total stockpile of 130–140 warheads.

Source: Bulletin of Atomic Scientists, 2018 (Hans M. Kristensen & Matt Korda, 2018)

C. Indian Sea-Based Deterrence

India has also developed its sea leg of delivery system of nuclear weapons. It developed ship-launched nuclear capable missile and nuclear powered and nuclear capable submarine that complete its nuclear triad. The 400 km range *Dhanush* is the ship-based ballistic missile of India. It is single-stage, liquid-fuel, short-range ballistic missile. It can be launched from Sukanya-class patrol vessels *Subhadra* and *Suvarna*; each ship can carry two missiles (Hans M. Kristensen & Matt Korda, 2018). One of the important features of India's strategic forces is nuclear-powered SSBN, the *INS Arihant*, that was commissioned in August 2016 but it had to undergo repairs into its propulsion system in 2017 and 2018 (D. Peri and J. Joseph, 2018). India is also planning its second SSBN, the *INS Arighat* that was launched in 2017 and will be commissioned in 2020–2021 (Bedi R. , 2017). The two submarines, *Arihant* and *Arighat* would carry the K-15 (*Sagarika*) submarine launched ballistic missile (SLBM). The missile has a range of 700 kilometres. The K-4 is another SLBM, having range of 3,500 kilometres (Hans M. Kristensen & Matt Korda, 2018). India believes that its submarine launched ballistic missiles provide it an assured second strike capability. The Indian nuclear forces are in process of being developed and will grow in future as India is modernizing and developing more sophisticated weapons technology. The nuclear and missile build up is a matter of concern for regional peace and stability and implies Pakistan to entangle into an arms race, posed by India.

III. Pakistan's Nuclear Forces

Like India, Pakistan has also developed a range of its nuclear weapons delivery systems from short range missiles to submarine launched cruise missiles. It also claims to have adopted a nuclear triad. Its nuclear weapons delivery systems are composed of nuclear capable aircrafts, land-based missiles, air launched missiles and sea launched missile.

A. Aircraft

Two aircrafts can be used for nuclear weapons delivery by Pakistan Air Force; one is the US made F-16A/B which were delivered to Pakistan between 1983 and 1987 and the second is French made Mirage III/V. Mirage may be used for test launch of air launched cruise missile, *Ra'ad*. Pakistan may modify its Chinese origin JF-17 fighter as nuclear-capable due to the US military export sanctions on Pakistan's nuclear program, including the withholding of F-16 aircraft. However, it is uncertain about the nuclear role of JF-17 (Hans M. Kristensen, Robert S. Norris & Julia Diamond, 2018).

B. Land Based Missiles

There are six types of operational nuclear-capable land-based ballistic missiles in Pakistan's missile inventories. These missiles have short-range and medium range capabilities. *Abdali* (Hatf-2), *Ghaznavi* (Hatf-3), *Shaheen-1* (Hatf-4), and *Nasr* (Hatf-9), are the short-range weapon system. The medium-range missiles are *Ghauri* (Hatf-5) and *Shaheen-2* (Hatf-6). The medium-range *Shaheen-1A*, *Shaheen-3*, and the MIRV *Ababeel* are under development. Pakistan has significantly developed its missile force structure including four or five missile garrisons along the Indian border for short-range systems (*Babur*, *Ghaznavi*, *Shaheen-1*, *Nasr*) and three or four other garrisons further inland targeting of India, the medium-range systems (*Shaheen-2 and Ghauri*) (Hans M. Kristensen, Robert S. Norris & Julia Diamond, 2018). In the following, a chart reflects Pakistan's nuclear forces.

Table 2

Type	NATO designation	Number of launchers	Year deployed	Range (kilometers)[1]	Warhead x yield (kilotons)[3]	Number of warheads[2]
Aircraft						
F-16A/B		~24	1998	1,600	1 x bomb	~24
Mirage III/V		~12	1998	2,100	1 x bomb (or Ra-ad)	~12
Subtotal:		***~36***				***~36***
Land-based ballistic missiles						
Abdali (Hatf-2)		10	(2015)	200	1 x 5-12 kt	10
Ghaznavi (Hatf-3)		~16	2004	300	1 x 5-12 kt	~16
Shaheen-1(Hatf-4)		~16	2003	750	1 x 5-12 kt	~16
Shaheen-1A (Hatf-4)		-	(2018)	900	1 x 5-12 kt	-
Shaheen-2(Hatf-6)		~12	2014	1,500	1 x 10-40 kt	~12
Shaheen-3 (Hatf-6)		-	(2018)	2,750	1 x 10-40 kt	-
Ghauri (Hatf-5)		~24	2003	1,250	1 x 10-40 kt	~24
NASR (Hatf-9)		~24	(2013)	60-70	1 x 5-12 kt	~24[4]
Ababeel (Hatf-?)		-	-	2,200	MIRV or MRV	-
Subtotal:		***~102***				***~102***
Ground and air-launched cruise missiles						
Babur GLCM (Hatf-7)		~12	2014	350[5]	1 x 5-12 kt	~12
Babur-2/1(B) GLCM (Hatf-?)		-	-[6]	700	1 x 5-12 kt	-
Ra'ad ALCM (Hatf-8)		-	(2017)	350	1 x 5-12 kt	-
Ra'ad-2 ALCM (Hatf-?)		-	(2018)	>350	1 x 5-12 kt	-
Subtotal:		***~12***				***~12***
Sea-based cruise missiles						
Babur-3 SLCM (Hatf-?)		-	-[7]	450	1 x 5-12 kt	-
Total						**~140-150**

[1] Range listed is unrefueled combat range with drop tanks.
[2] There may be more missiles than launchers but since each missile is dual-capable, this table assigns an average of one warhead per launcher unless noted otherwise.
[3] Yield estimate is based on the range of yields measured in the 1998 nuclear tests. It is possible that Pakistan since has developed warheads with lower and higher yields.
[4] Each NASR launcher has up to four missile tubes. But since NASR is a dual-capable system and the primary mission probably is conventional, this table counts only one warhead per launcher.
[5] The Pakistani government claims the Babur range is 700 kilometers, twice the 350-km range reported by the US intelligence community.
[6] The Babur-2/1(B) seems to be an improved version of the original Babur GLCM. It was first tested on 14 December 2016.
[7] The Babur-3 SLCM was first test launched on 9 January 2012 from an underwater platform.

Source: Bulletin of Atomic Scientists, 2018 (Hans M. Kristensen, Robert S. Norris & Julia Diamond, 2018)

C. Short-Range Missiles

The short-range, solid-fuel, single-stage *Abdali* (Hatf-2) has a range of around 200 Km and can carry conventional and nuclear warheads (ISPR Press Release No. PR20/2013ISPR, 2013). The short-range, solid-fuel, single-stage *Ghaznavi* (Hatf-3) has a range of 300 Km. It can carry nuclear and conventional warheads (ISPR Press release No. PR98/2014-ISPR, 2014). The Shaheen-1 (Hatf-4) is a single-stage, solid-fuel, dual-capable, short-range ballistic missile, having a range of 750 km. It is carried on road-mobile Transport Erector Launcher (TEL). An upgraded version of Shaheen-1 is Shaheen-1A whichhas been tested since 2012 having range of 900 km (Press Release No PR382/2015/ISPR, 2015).

Another important short-range missile is *Nasr* (Hatf-9), having range of 60 Km, extended to 70 Km in 2017 is intended for battlefield use against invading Indian troops (Ahmed, 2016). Pakistan tested these missiles in February 2019 through road-mobile TEL during a military exercise. The official statement read that;

"This Weapon System has augmented Full Spectrum Deterrence posture remaining within the precincts of policy of Credible Minimum Deterrence, against prevailing and evolving threat spectrum more effectively including enemy's ballistic missile defence and other Air Defence Systems." (ISPR Press Release no. No PR-32/2019-ISPR, 2019)

It is estimated that this weapon system has been in service since 2013 (Ballistic and Cruise Missile Threat , 2013). Possible deployment locations of Nasr include Gujranwala, Okara and PanoAqil (Hans M. Kristensen, Robert S. Norris & Julia Diamond, 2018).

D. Long-Range Missiles

The medium-range, two-stage, solid-fuel Shaheen-2 (Hatf-6) has a range of 1500 Km has been tested since 2004 and 2005 and appears to be operational now (ISPR Press release No. PR248/2014-ISPR, 2014). A report states that there are "fewer than 50" Shaheen-2 launchers deployed (Ballistic and Cruise Missile Threat, 2017). Pakistan's medium-range missile, Shaheen-3 was tested twice in 2015. The missile has a range of 2750 Km and capable of delivering a nuclear or conventional warhead. However, it would need more tests to get operationalized. The range of Shaheen-3 covers all of mainland India. Pakistan's oldest nuclear-capable medium-range ballistic missile is *Ghauri* (Hatf-5). It is the road-mobile, single-stage, liquid-fuel and having a range of 1300 Km. The operational test of the missile was conducted on April 15, 2015 (ISPR Press release No. PR92/2014-ISPR, 2015). In January 2017, Pakistan also tested its 2200 Km medium-range ballistic missile, *Ababeel*, capable of carrying multiple warheads using Multiple Independent Re-entry Vehicle (MIRV) technology. According to the official statement of the government of Pakistan;

"Ababeel is capable of carrying nuclear warheads and has the capability to engage multiple targets with high precision, defeating the enemy's hostile radars. Development of Ababeel Weapon System is aimed at ensuring survivability of Pakistan's ballistic missiles in the growing regional Ballistic Missile Defence (BMD) environment. This will further reinforce deterrence." (ISPR Press release No. PR34/2017-ISPR, 2017)

The long-range ballistic missiles are considered to be significant weapons that build up Pakistan's credible deterrent infrastructure. The addition of MIRV technology in Pakistan's missile capabilities has dented India's BMD system and balanced India's efforts to attain escalation dominance and damage limitation.

E. Ground-and Air-launch Cruise Missiles

Pakistan has developed a variety of ground and air-launched cruise missiles along with ballistic missiles. The ground-launched cruise missile (GLCM) is 700 Km *Babur* (Hatf-7) and the air-launched cruise missile (ALCM) is *Ra'ad* (Hatf-8). There are three variants of Babur cruise missile, Babur-I, Babur-II and Babur-III. The first two versions, Babur-I and Babur-II are ground launched cruise missiles (GLCM) and third version, Babur-III is the sea launched cruise missile (SLCM). (Missile Defense Project, "Hatf 7 "Babur"," Missile Threat, 2018). The air-launched, dual-capable cruise missile *Ra'ad* (Hatf-8) has been tested six times, most recently in February 2016. The missile may get operational readiness. The test-launches have been conducted from a Mirage III fighter-bomber. The missile has a range of around 350 Km and able to carry both conventional and nuclear warhead. The official statement read that,

"Ra'ad Cruise Missile with Stealth Capabilities is a Low Altitude, Terrain Hugging Missile with high maneuverability, and can deliver nuclear and conventional warheads with great pin point accuracy." (ISPR Press release No. PR104/2011-ISPR, , 2011)

F. Sea-launch Cruise Missile

In response to India's sea based submarine launched ballistic missile and its BMD system, Pakistan has also responded by demonstrating its capabilities of sea based deterrence when it tested its Submarine Launched Cruise Missile (SLCM) *Babur-III* in January, 2017. The missile is capable of carrying conventional and nuclear warhead and has a range of around 450 Km. The official statement read that,

"The missile features terrain hugging and sea skimming flight capabilities to evade hostile radars and air defenses, in addition to certain stealth technologies, in an emerging regional Ballistic Missile Defence (BMD) environment. Babur-3 SLCM in land-attack mode, is capable of delivering various types of payloads and will provide Pakistan with a Credible Second Strike Capability, augmenting deterrence." (ISPR Press Release No. PR10/2017-ISPR, 2017).

Pakistan has to devote a large chuck of its budget to defence sector despite being a developing economy. It has to cater for ensuring deterrence by investing on conventional and nuclear weapon capabilities to avert Indian aggression. India has put Pakistan into an inescapable reality of arms race. The following section, therefore, assesses factors of this arms race.

IV. Nuclear Competition: Motivations & Compulsions

The trends of development of new weapons technology and addition to existing weapons system indicate that India and Pakistan have completed nuclear 'triad' of delivery systems of nuclear weapons (i.e. the capabilities to carry and deliver nuclear weapons from air, land and sea). Both states have acquired such technologies to deter each other through a second-strike capability. However, the intriguing question remains at the heart of all strategic debates, *how much is enough?* and *what will be the 'minimum' numbers of nuclear weapons both states aim at to achieve their 'credible minimum deterrence'? P*ursuing an arms race without considering the strategic implications for the regional peace and stability is alarming in light of current regional strategic environment. There has been a debate if India is arming without strategic purpose (Cohen & Dasgupta, 2010). India and Pakistan may think that arms race reinforce their deterrence postures. This model works on the principle that each side attempts to acquire arms superiority or planning a pre-emptive attack. Michael D. Intriligator and Dagobert L. Brito analysing arms race and instability write that;

"…there is arms race instability as each side acquires more and more weapons. At the same time, there is stability at the outbreak of war as each side has more than enough weapons to deter the other… the resulting large and growing weapons stocks reinforce deterrence and make pre-emptive strike impossible, thereby contributing to the stability against the outbreak of war." (Michael D. Intriligator & Dagobert L. Brito, 1986)

This assumption seems true because both India and Pakistan faced five crises since their nuclearization but neither of the crises spurred into a full-scale warfare. These five crises are Kargil Conflict in 1999 , Twin Peak crisis or (Operation Parakram) in 2001-02, Mumbai crisis in 2008, Indian so-called surgical strike in response to Uri attack in 2016 and the most recent Pulwama-Balakot incidents in February, 2019 (Muhammad, 2019), (Hussain, 2019) and (Bukhari, 2019). The model of 'arms race stability'i.e. (build more weapons to deter adversary) (Michael D. Intriligator & Dagobert L. Brito, 1986) might be affordable for the established economic powers like the US and the Soviet Union who developed thousands of nuclear weapons and missiles during the Cold War. However, the arms race is affecting and will adversely affect the economic prosperity of South Asian nations. The nuclear and missile race in South Asia is taking place due to two main factors; security dilemma, and existence of mistrust, suspicion and unresolved disputes between these two states, including Kashmir and others.

A. Security Dilemma

India and Pakistan have kept into an unabated arms-race due to security dilemma. John Herz and Robert Jervis aptly illustrated the theoretical assumptions of the concept. The security dilemma emerges when one state builds its military capabilities to ensure its security but that diminishes the security of other state. Jervis claimed that arms race may become a product of this security dilemma between states. He provided an example of British and French foreign policies in the interwar years. He claimed that Britain and France felt that increase in arms production of each country would proportionally increase their security (Jervis, 1978) i.e. to invoke the idea that "if you want peace, prepare for war." (Si vis pacem, para bellum)

Andrew Futter explaining the security dilemma illustrates that; "Actions taken to increase the credibility of one's own nuclear forces – such as by building more warheads, keeping forces on higher alert, or building different types of delivery systems will necessarily have knock-on effects for the thinking and nuclear deterrence calculations of other states. This phenomenon is known as the security dilemma, and can result in highly destabilising strategic scenarios as rival nuclear-armed states vie for superiority and military advantage, and therefore credibility, through nuclear arms racing" (Futter, 2015).

India and Pakistan's arms race phenomenon can be explained by keeping in consideration of the security dilemma between these states. However, some scholars argue that South Asian threat assessment is not only a bilateral phenomenon (between India and Pakistan) rather trilateral one that includes China as well. Pakistan claims that its nuclear weapons program is only aimed to deter Indian aggression, however; Indian's threat perception is generated not only from Pakistan but also from China that brew a complex situation of arms development in the region. This factor constitutes for what Gregory Koblentz referred to as 'security trilemma' which holds that actions taken by one state to protect itself from a second make a third feel insecure (Koblentz, November 2014). In this sense, while India tries to protect itself from China, it makes Pakistan insecure.

Toby Dalton is of the view that in South Asian triangle, China is the dominant competitor, sitting at the apex of the triangle, having strategic relationships with India and Pakistan, who occupy the end points of the base. "The Sino-Indian leg is competitive; the Sino-Pakistani leg is cooperative." (Dalton, 2013)Developments in one leg affect the others. Efforts of India to attain strategic parity with China motivate Pakistan's nuclear developments to bridge the deterrence gaps and seek closer relations with China to balance perceived threats from India (Dalton, 2013).Adil Sultan differs from the South Asian triangular relationship and claims that,

"These three countries are expanding their capabilities, but at a distinctly different pace and to pursue diverse political and security objectives, which could best be described as two separate sets of dyads between India-China and India-Pakistan, and not necessarily a result of a triangular competition" (Sultan, 2019).

Sultan's proposition rests on the assumption that India spent $ 60 billion in its last defence budget (2018-19), six times more than that of Pakistan that spent $ 9.6 billion and almost four times less than that of China which spent $ 228 billion. India is now the largest importer of arms in the world. Sultan contends that India is long way to credibly threaten China despite its massive military spending. However, "the growing conventional asymmetry between India and Pakistan is likely to strain India-Pakistan deterrence dyad further, forcing the latter to increase its reliance on nuclear weapons" (Sultan, 2019).

B. Mistrust, Suspicion and Unresolved Issues

The existence of mistrust between India and Pakistan is also a contributing factor in arms race between these two states. This mistrust persists due to many factors including historical legacy of separation, wars, conflict and crises. Both countries fought three major wars of 1948, 1965 and 1971, entangled into a conflict of 1999 in Kargil and faced many crises that mark their historical relationship spanning seven decades. T.V. Paul said that,

"the India-Pakistan dyad contains factors such as unsettled territorial issues, political incompatibility, irreconcilable positions on national identity, and the absence of significant economic and trade relations between the two states, all cause the rivalry to persist" (Paul, 2006).

There have been many unresolved issues between India and Pakistan. These issues have played a fundamental role in escalating armed conflicts. The India-Pakistan Composite Dialogue held in 2004 laid out eight agenda points agreed between Indian Prime Minister Atal Behari Vajpayee and Pakistan's President, Gen. Musharraf. These eight points were "Peace and Security including CBMs, Jammu and Kashmir, Siachen, Sir Creek, Wullar Barrage/Tulbul Navigation Project, Terrorism and Drug Trafficking, Economic and Commercial Cooperation and Promotion of Friendly Exchanges in Various Fields" (Padder, 2012). Amongst these issues, Kashmir remains a dominant cause of conflict between the two states. Many CBMs were held under the composite dialogue process like Friendship Bus service, easing of visas, softening of borders in Kashmir; however, the 2008 Mumbai attacks turned off all avenues of cooperation. Since then, there had been a lack of cooperation and mistrust between these two states. Pakistan has tried to bridge this mistrust when former Pakistani Prime Minister Nawaz Sharif went to India in oath taking ceremony of Narendra Modi in 2014 (Nawaz Sharif arrives in India for Modi's swearing-in ceremony, 2014) but it was a false dawn. The surprise visit of Narendra Modi on December 25, 2015 (on the day of birthday of Nawaz Sharif on which Modi greeted him) was hoped to restart the peace process (India PM Modi makes surprise Pakistan visit, 2015). However, events in 2016 including the Pathankot and Uri attack and India so-called surgical strike drama turned the tide. Since then, there has been a low intensity conflict across the working boundary and LoC as both the states are involved in violation of 2003 ceasefire agreement between India and Pakistan. The Pulwama incident in February 2019 and ensuing incidents have alarmed the two South Asian states, both having around 150 nuclear weapons each in their arsenals. The crisis again brought South Asia as a nuclear flashpoint.

Ironically, given massive arms build-up, India is instituting a strategy known as Cold Start doctrine/ proactive strategy to carry out a limited conventional war against Pakistan. (Walter C. Ladwig III, 2007/08) Though, nuclear deterrence and the foreign mediation worked in the past South Asian crises. The future crisis may spur to the nuclear level.

V. Implications

Arms build-up by India along with such military strategies would have serious implications for peace and stability of South Asia. The nuclear and missile arms race might produce two possible implications. The arms race between India and Pakistan may undermine the utility of deterrence which is based on the mutuality of vulnerability. The phenomenon of deterrence works on the threat of a nuclear attack. However, if a state builds its massive military capabilities that make it so confident for carrying out a limited strike under the nuclear threshold, it undercuts the effectiveness of deterrence. The vulnerability of the use of nuclear weapons is lessening as the balance of terror is tilting in India's favour as it is developing the BMD system. The arms build-up calls for offensive posture in nuclear doctrine of India as transpired in its Cold Start or proactive strategy. Pakistan aware of the growing threat assessment also took certain steps like the testing of short-range missiles *Nasr, Ra'ad*and *Babur*, submarine launched cruise missile, *Babur III* and testing of MIRV, *Ababeel* missile. SadiaTasleem states that;

"The introduction of new weapon systems in the region indicates an emerging trend in favor of war-fighting doctrines in both India and Pakistan. The rapid growth of counterforce capabilities could enable decapitating first-strike options. India's testing of ballistic missile defense (BMD) interceptor missiles and Pakistan's testing of multiple, independently targetable re-entry vehicle (MIRV) technology has further compounded technological and doctrinal uncertainties making an already fragile region more volatile." (Tasleem, 2017).

Tasleem giving a talk at Karachi University in 2015 held that, "We are adding to our nuclear arsenal to the point where it has become dangerous for us." (Siddiqui, 2015) Tahir Nazir also claimed that, "The colossal conventional arms build-up in the region, coupled with the nuclearization of the Indian Ocean and policies for the development and potential deployment of ballistic missile defence systems, has the potential to change the balance of power in the region." (Nazir, 2018) The whole phenomenon of arms build-up by one state, calling other to also build its military capabilities is a cyclical process, generated by the factors mentioned above. These developments if not checked would also breed new arms race in the region. This is called as 'arms race instability' in which "there is a quantitative or qualitative arms race between two or more nations for which the levels of weapons or their capabilities spiral to higher and higher levels without reaching an equilibrium" (Michael D. Intriligator & Dagobert L. Brito, 1986).

VI. Conclusion

The history is witness that arms race in the nuclear arena benefited neither the US nor the Soviet Union during the Cold War. Ultimately, both the states had to cut down the stockpiles of their respective nuclear weapon forces under the arms control arrangements. Getting lessons from the Cold War, it is imperative that both India and Pakistan should realize the dangers emanating from the continuous arms race in the region and should find ways in which this arms race should be mitigated. Three important steps can be taken in this regard.

India and Pakistan must develop a Crisis Management Mechanism to avoid any accidental or inadvertent use of nuclear weapons. For instance, India and Pakistan have certain CBMs like hotline agreement between DGMOs of both states and foreign secretaries, pre-notification of ballistic missile tests by one state to the other and earliest notification of any accidental or inadvertent use of nuclear weapons (Confidence-Building and Nuclear Risk-Reduction Measures in South Asia, Stimson Center, 2012). It is high time that India and Pakistan must establish framework of crisis management to avoid escalation that may be possible through reinvigorating the CBMs between India and Pakistan, promoting track II diplomacy, back door diplomacy, especially in times of crises and agreeing to accept role of third party mediation which may be a neutral party for instance, the UN, Russia, China, EU, UK, etc. Moreover, Pakistan and India might get lessons from the US and the Soviet Union arms control arrangements and may sign arms control agreements like the Anti-Ballistic Missile (ABM) Treaty, START treaties. It is pertinent that the crisis management mechanism can only turn into reality once the comprehensive composite dialogue is revived in good faith by each party. Michael Krepon held that; "deterrence stability has proven feasible only when nuclear-armed states have little or nothing to fight about, when they address their security concerns through diplomatic means." (Krepon, 2015) The agreed framework of 2004 under composite dialogue should be revived. Though, the possibilities of such move seem distant. Pakistan proposed to India in 1998 when both states went nuclear for a 'Strategic Restraint Regime' which has three interlocking elements of nuclear restraint, balanced conventional forces, and resolution of disputes. However, this proposal was rejected by

India arguing that Indian military capabilities and force posture are driven by threat perceptions extending beyond Pakistan.

Arms race in South Asia has driven resources of the two countries, plagued with hunger, poverty and unemployment. This arms race is hard to sustain for developing economies of the region. For peaceful and stable South Asia, both India and Pakistan should find ways that benefit them to deal with issues underdevelopment. Though the course of peace and cooperation seems difficult under present circumstances, yet it is not impossible. Dialogue with good faith is a pre-requisite.

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