Missile Race in South Asia: Security Challenges for Pakistan in the 21st Century

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Abstract

The article assesses the nature of missile competition between India and Pakistan and how it impacts deterrence and strategic stability in South Asia. It also analyses how their respective ballistic and cruise missile programmes developed. Taking the action-reaction model of arms racing, it concludes that there is indeed such a dynamic at play between the two countries. The missiles competition is very much linked to the nuclear competition as well. India's Ballistic Missile Defence (BMD) system also factors into the competitions, whereby Pakistan was forced to develop missiles that could saturate and defeat it. The missile and nuclear competition has an overall negative impact on deterrence and strategic stability in South Asia. Pakistan's biggest security challenge is to achieve security and deterrence against a hostile India without falling into the trap of an economically ruinous arms race.

Keywords: Arms Race, Ballistic Missiles, Cruise Missiles, Ballistic Missile Defence, Nuclear Deterrence, Strategic Stability.

Introduction

India and Pakistan have been locked in an adversarial relationship since their independence in 1947. The relationship has been characterised by conflict and rivalry that has resulted in four wars, frequent border skirmishes and exchange of hostile statements by the top leadership. Pakistan, being the smaller and economically weaker state, has always perceived its major security threat from India. On the other hand, India also sees Pakistan as a security threat. However, India's security and foreign policy is also driven by its goals to achieve a major regional and global power status. These diverging security orientations have resulted in an arms race which was conventional to begin with but has turned into a nuclear one after the

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introduction of nuclear weapons in the equation. The bilateral competition also extends to the development of ballistic missiles. Here again, India has been developing missiles that can not only reach entire Pakistani territory, but also working on intercontinental ballistic missiles that would be able to reach some parts of China and beyond. Pakistan's missile programme is entirely India-centric and designed to deter any aggression from India, while India's ballistic missile programme is also driven by its great power ambitions. India also feels threatened by China, thus, its security policy is also geared towards countering any threats from Beijing. This feeds negatively into the security dynamics of India and Pakistan.

New Delhi and Islamabad both have well-established ballistic missile programmes. They have large missile forces and continue to rapidly develop them. In the last decade alone, India has developed short- and medium-range ballistic missiles, as well as sea-based systems. It has also developed two cruise missiles. On the other hand, Pakistan has also expanded its missile programme and developed seven ballistic missiles ranging from short- to medium-range, as well as two cruise missiles. Their missile competition now extends to the maritime domain. India has also developed submarine-launched ballistic missile (SBLM), which it plans on fielding on a fleet of four to six nuclear-powered submarines.

The ballistic missile competition is very much linked to the nuclear competition. India's development of Ballistic Missile Defence (BMD) also factors in the competition. It affects Pakistan's calculations of the type and number of missiles and warheads it needs to defeat an Indian Missile Defence System. With this background, this article assesses the nature of the missile competition and how it impacts deterrence and stability in South Asia. It analyses the ballistic missile competition between India and Pakistan. It also assesses whether there is an action-reaction dynamic at play between the missile programmes of the two countries. It addresses questions like: What drives the missile programmes of India and Pakistan? What is the effect of missile competition on strategic stability in South Asia? What policy option does Pakistan have to deal with potential instability introduced by the missile competition?

Theoretical Framework

The article looks at the action-reaction dynamic to assess whether there is a link between the missiles and nuclear programmes of India and Pakistan. The article takes guidance from Realist tradition and, in particular, the theory of security dilemma[1] to trace the action-reaction dynamic in the security policies and weapons development[2] between the two archrivals.

There are several theories of arms races. Dr. Naeem Salik propounds three models of arms racing: a) the action-reaction model; b) the domestic structure model and c) the technological imperative.[3] The domestic structure or the bureaucratic model sees the driving causes of arms races as internal. More specifically, the major players in this model are the corporate interests of research and development organisations, inter-service rivalry and domestic politics.[4] The technological imperatives model sees technological innovations and the lobbying by military-industrial complexes as the driving force behind arms races. Since, in India and Pakistan, the research and development of missile and nuclear technology is owned and run by the state, this model is not applicable to South Asia. The action-reaction model is most relevant to India and Pakistan dynamics. It sees threat perceptions of the states as the driving force of arms race. The states build up their arms ─ qualitatively and quantitatively ─ in response to the existential threats or perceived threats from other states.

[1] The theory was originated by John Herz, who argues that in an anarchic international system, states are concerned about their security. An increase in power by one state threatens other states, causing them to acquire power. This renders state an insecure thus resulting in action-reaction spiral of power and security accumulation. John Herz, "Idealist Internationalism and the Security Dilemma," World Politics, vol. 2 (1950).

[2] Barry Buzan and Eric Herring, *The Arms Dynamics in World Politics* (London: Lynne Rienner Publishers, 1998).

[3] Naeem Salik, "Strategic Stability in South Asia: Challenges and Prospects," Institute of Strategic Studies, Islamabad, *Islamabad Papers*, Nuclear Paper Series, February 2016, 6.

[4] Ibid.

Indian Missile Programme

In missile development, India seems to have taken the lead with Pakistan following closely. India's space and missile programme started in 1970s but it was not until 1988 and 1989 that it could test its first short- and medium-range ballistic missiles respectively.[5] In the 1980s India initiated an elaborate missile programme with the goal to develop five missile systems. The Integrated Guided Missile Development Programme (IGMDP) envisioned developing Trishul, Nag, Akash, Prithvi and Agni.[6] With the range of 150 km, the first test of Prithvi-1 was conducted in 1988 while Prithvi-2 (250 km range) was tested in 1996 for the first time. By 1997, India had conducted about 16 Prithvi tests, and built around 40 of these missiles which it began inducting in the Indian Army.[7] It combined this technology from the existing civilian space programme with reverse engineering from the Russian missiles and elsewhere to develop its Prithvi, Agni and other series of missiles.[8]

Over the years, India managed to build up a significant technical base which helped it pursue an ambitious Ballistic Missile Programme. From the year 2000 onwards, India expanded its missile programme and developed 11 missiles including short-range Prithvi and Prahaar, the medium- and intermediate-range Agni 1 to Agni 5 series. It also developed two SLBM, the K-15 and K-4, as well as the cruise missiles ─ Brahmos and Nirbhay.[9]

India developed the series of missiles based on the Agni Technology Demonstrator (AGNI-TD) which was tested in 1989. This led to the development of the Agni 1 and Agni 2 medium-to intermediate-range missiles. These were inducted into the Indian Army around 2002, with the

[5] Naeem Ahmad Salik, The Genesis of South Asian Nuclear Deterrence: Pakistan's Perspectives (Oxford: Oxford University Press, 2009), 194-5.
[6] IGDMP report on DRDO website, http://drdo.gov.in/drdo/pub/monographs/Introduction/IGMDP.pdf
[7] Dinshaw Mistry, "South Asia's Missile Expansion," *The Non-proliferation Review*, 22:3-4, 2015, 362.
[8] The Prithvi is a derivative of Russian-supplied missiles SA-2, and the medium range Agni (tested in 1989) was based on the Russian SA-2 and US Scout. Feroz Khan, Gaurav Rajen and Michael Vannoni, "A Missile Stability Regime for South Asia," The Cooperative Monitoring Center (CMC) occasional paper/35, SAND 2004-2832, June 2004, Sandia National Laboratories.
[9] Mistry, "South Asia's Missile Expansion," 362.

Agni-2 being in actual operational service around 2005. At present, Agni-1 to 4 missiles are already in service. These range from short-, medium- to intermediate-range missiles. Ranges of Agni-1 and -2 are enough to cover entire Pakistani territory while Agni-3 and -4 can target the Chinese territory. Agni-3's initial tests took place in 2006 and 2007 was inducted in 2011 while Agni-4 was inducted in 2014.[10] The intercontinental ballistic missile, Agni-5 with 8000 km range is under development. It was first tested in April 2012. It can hit all major Chinese cities. It has the capability to carry multiple warheads and a canisterised launch system which gives more mobility and flexibility. However, it also necessitates the mating of the warhead to the missile and storage of the complete system for up to ten years. This has serious implications for political control of nuclear warheads.

Table No. 1
India's Missiles

Missile	Range (km)	Payload	First Test	Tests Through Dec 2015
Prithvi 1/2	150/350	800/500	1988	60+
Agni-1	700	1000	2002	14
Agni-2	2000	1000	1999	10
Agni-3	3000	1500	2006	7
Agni-4	4000	1000	2010	6
Agni-5	>5000	1000?	2012	3
Dhanush	350	500	2000	
K-15 (Sagarika)	700	500-600	2008	7
K-4	3,000		2014	1
Brahmos	290		2001	50
Nirbhay	700		2013	3
Prahaar	150		2011	1

Source: SIPRI Yearbook 2013, Armaments, Disarmaments and International Security (Oxford University Press, 2013), 312 and Dinshaw Mistry, "South Asia's Missile Expansion," *The Nonproliferation Review*, 22:3-4 (2015): 361-377, 363.

India developed the cruise missile, BrahMos, jointly with Russia. The BrahMos was developed originally as an anti-ship supersonic

[10] "India's Strategic Nuclear and Missile Programs ─ A Baseline Study," Project Alpha, June 2017, Centre for Science and Security Studies, King's College London, https://projectalpha.eu/wp-content/uploads/sites/21/2017/6/India-Alpha-in-Depth-Public-Release-final-1.pdf

missile but later reconfigured for ground launch anti-land and an air-launch version. After several tests, in early 2000s, Brahmos was first inducted into the Indian Navy in 2005 and later into the Indian Army in 2007.

Deciding to operationalise its third leg of the nuclear triad, India developed its K-series sea launched missiles. The 700 km short-range K-15(Sagarika) went through a series of tests in mid 2000s, and further tests from a submerged platform between 2008 and 2013. The 3000 km intermediate range nuclear-capable SLBM, K-4 was first tested from an underwater pontoon in March 2014.[11] It is partially based on the technology developed under the Agni series and is based on Agni-3. The missiles are designed to be deployed on India's ballistic missile nuclear submarine (SSBN), INS Arihant, which was inducted in the Indian navy in August 2016.[12] The submarine has four vertical launch tubes, with the capability to be armed with either four K-4 missiles or 12 K-15 missiles.[13] Two other possible missiles can be deployed on the Arihant ─ one is the subsonic cruise missile, the Nirbhay, which has a 1000 km range and the other is the naval variant of the supersonic cruise missile BrahMos. Nirbhay was successfully tested in October 2014.[14] Nirbhay is designed to complement the BrahMos by giving a longer-range capability at subsonic velocity.

The BrahMos has a range of around 300 km, while the Nirbhay is within the range of 1000-1500 km.[15] India also has a sea-launched surface-to-surface tactical missile Dhanush with 350 km range. It is the naval variant of the Prithvi II and was inducted in 2004.[16] India plans to build four to six nuclear powered submarines in the next decade. It already has one

[11] T. Subramanian, 'Success on Debut for Undersea Launch of Missile,' *Hindu*, May 08, 2014, http://www.thehindu.com/news/national/success-on-debut-for-undersealaunch-of-missile/article5986757.ece.
[12] "INS Arihant Completes India's Nuclear Triad," *Economic Times*, November 6, 2018, https://economictimes.indiatimes.com/news/defence/ins-arihant-completes-indias-nuclear-triad-pm-modi-felicitates-crew/articleshow/66509959.cms
[13]Franz-Stefan Gady "India Quietly Commissions Deadliest Sub," *The Diplomat*, October 19, 2016, https://thediplomat.com/2016/10/india-quietly-commissions-deadliest-sub/
[14] "India Test Fires Nuclear-Capable Nirbhay Cruise Missile," *Times of India*, October 17, 2014.
[15] "India's Strategic Nuclear and Missile Programs ─ A Baseline Study."
[16] Ibid.

submarine operational. With some of its K-series missiles and cruise missiles operational, India already has a second-strike capability. Moreover, with the rapid pace of development of its sea-based missiles, this capability would be strengthened and deepened in the coming decade.

India is also working on many missiles and technologies that would become operational in the coming years. It is pursuing multiple re-entry vehicles (MRV) and multiple independently-targeted re-entry vehicles (MIRV) technology for its ballistic missiles. It is also working on longer range Intercontinental Ballistic Missiles ─ the Agni-6 and Suryra projects. It is also pursuing the K-5 which is a SLBM with a 6,000 km range. The BrahMos Aerospace is building a new hypersonic missile, the Brahmos II.[17]

Thus, India has an extensive missile programme that includes a host of short- medium- and long-range missiles, cruise missiles and sea-launched missiles that go beyond minimum deterrence needs. Some have suggested that the precision weaponry India has developed would aid the development of counterforce strategy against Pakistan. They go as far as suggesting that India's quest for constant up-gradation of its nuclear forces reveals a possible strategy of pre-emptive strike against Pakistani nuclear forces in a crisis.[18]

India's Missile Defence Programme

Since 1990s, India is also developing a BMD system reportedly to counter nuclear attack by Pakistan among other threats.[19] The Indian BMD system is comprised of two layers of defence. The Prithvi Air Defence (PAD) is for exo-atmospheric interception at altitudes of 50 km - 80 km, while the Advanced Air Defence (AAD) missile is for endo-atmospheric interception at 15 km-30 km.[20] This system represents the first phase of the BMD programme. In 2012, the DRDO Director General, Vijay Kumar Saraswat,

[17] Ibid.
[18] Christopher Clary and Vipin Narang, "India's Counterforce Temptations: Strategic Dilemmas, Doctrine, and Capabilities," *International Security*, vol. 43, no. 3 (Winter 2018/19): 7-52.
[19] Raj Chengappa "The New Guardian*" India Today*, December 11, 2006 and Eric Auner "Indian Missile Defence Program Advances," *Arms Control Today*, January 15, 2013, https://www.armscontrol.org/act/2013_01-02/Indian-Missile-Defense-Program-Advances.
[20] Eric Auner, Ibid.

claimed that the BMD is functional and ready to protect two Indian cities namely Delhi and Mumbai.[21] These missile defence systems are designed to intercept missiles with 2,000 km range.[22] In phase two of the project, India plans to develop the AD-1 and AD-2 with the capability to intercept Intermediate Range Ballistic Missiles (IRBM) and Intercontinental Ballistic Missiles (ICBMs). DRDO is aiming to augment the capability of the BMD to intercept missiles upto 5000 km in range.[23]

India also signed a US$5.5 billion deal with Russia in October 2018 to acquire five battalions of S-400 missile defence system. It has a 400 km range and the ability to engage and shoot down 80 missiles simultaneously.[24] The delivery of the air defence systems is scheduled from October 2020 to April 2023.[25] It would significantly enhance India's missile defence capabilities.

At present, India's BMD is aimed at protecting two cities against incoming short-and medium-range ballistic missiles initially, and the second phase of the programme aims at protecting against attacking IRBMs and ICBMs. Once Indian BMD is fully functional, it has the capability to intercept most of Pakistan's short-and medium-range ballistic missiles. It would be able to counter the Hatf, Ghauri and Shaheen series of missiles that are the mainstay of Pakistan's nuclear deterrence.[26] The S-400 systems, once acquired and integrated with India's indigenous system, would boost

[21] "Missile Defence System Ready for Induction: DRDO Chief," *Indian Express*, April 28, 2012.
[22] Frank O' Donnell and Yogesh Joshi, "India's Missile Defense: Is the Game Worth the Candle?" *The Diplomat*, August 2, 2013, https://thediplomat.com/2013/08/indias-missile-defense-is-the-game-worth-the-candle/
[23] "India to have Shield from Missiles of 5,000km Range," *Times of India*, June 16, 2013, https://timesofindia.indiatimes.com/india/India-to-have-shield-from-missiles-of-5000km-range/articleshow/20619039.cms?referral=PM
[24] "S-400: India Missile Defence Purchase in US-Russia Crosshairs," *BBC News*, October 18, 2018, https://www.bbc.com/news/world-asia-india-45757556
[25] "India Makes $800 Million Advance Payment for Russian S-400 Air Defence Systems," *The Diplomat*, November 20, 2019, https://thediplomat.com/2019/11/india-makes-800-million-advance-payment-for-russian-s-400-air-defense-systems/
[26] Ghazala Y. Jalil, "Indian Missile Defence Development: Implications for Deterrence Stability in South Asia," *Strategic Studies*, vol. 35, no. 2 (Summer 2015): 35, http://issi.org.pk/wpcontent/uploads/2016/5/Ghazala.35 No.2.pdf

the country's ability to protect against missile attacks. Once deployed along the border, it would give India a 600 km radar coverage with the ability to see within Chinese or Pakistani territory and an option to shoot down missiles or aircraft 400 km beyond its own border. In addition, India is also acquiring defence equipment for power projection in the Indian Ocean. The acquisition of S-400 would also upgrade Indian Defence System, thus, helping raise its military strategic profile to match that of the Chinese military might as well.

As Indian BMD improves technologically and acquires more sophistication, it will have a negative impact on nuclear deterrence. Development of BMD attacks the very basis of deterrence which is mutual vulnerability to a nuclear attack. Even though Indian BMD provides partial coverage, and less than hundred percent protection against attacking missiles, it would make nuclear deterrence between the two countries null and void. It would give India a false sense of security thereby increasing the chances that it would launch a nuclear strike knowing that its BMD would protect against a counterattack. This threatens Pakistan's security and deepens its security dilemma with India.

Pakistan's Missile Programme

Just as Pakistan's development of nuclear weapons capability was a response to India's nuclear weapons programme, its ballistic missile programme was also initiated in response to India's missile developments. In fact, it was a combination of the US denial of the promised F-16s to Pakistan, a series of military crises with India in the mid-1980s[27] and India's successful Prithvi and Agni missile tests that spurred the development of a modest Pakistani rocket programme. This became increasingly sophisticated over the years. Pakistan's missile programme is comprised of short- to medium-range missiles and spans three decades of indigenous development combined with foreign assistance. It forms the backbone of Pakistan's nuclear deterrence and of immense importance to the country.

[27] Michael Krepon and Liv Dowling, "Crisis Intensity and Nuclear Signalling in South Asia," in Sameer Lalvani and Hannah Haegeland (eds.) *Investigating Crises: South Asia's Lesson, Evolving Dynamics, and Trajectories,* January 2018, https://www.stimson.org/wp-content/files/file-attachments/InvestigatingCrises.pdf

Since the 1960s, both India and Pakistan had maintained civilian space programmes. However, it was not until India began the IGMDP in 1983 that the missile race began.[28] In response to India's missile developments, Pakistan used technology derived from sounding rockets to develop two short range missiles ─ the 80 km Hatf-1 and 200-300 km range Hatf-2 in the late 1980s.[29] Pakistan tested the Hatf missiles in February 1989, however, these were not nuclear capable. Initially lacking the technological base to develop ballistic missiles, Pakistan turned to foreign assistance. But the Missile Technology Control Regime (MTCR) was in place which meant that the country faced difficulty in procuring the necessary technology and components critical for the programme.[30] Formed in 1987, MTCR is a supplier control cartel which restricts the trade of missile related technologies and components.

India had started its missile programme before MTCR was formed so it faced fewer obstacles in procuring missile technology and components. In this regard, Rodney Jones aptly sums up Pakistan's dilemma, "As with nuclear weapons capabilities, India has set the pace in acquisition of missile delivery capabilities on the Subcontinent. Pakistan has invariably come from behind, facing tougher procurement obstacles and the consequences of greater planning uncertainty…Pakistan's later development efforts have been caught in ever tightening intelligence scrutiny and export controls."[31] Despite the difficulties, Pakistan procured Chinese M-11 missiles in early 1990s and reverse engineered them to produce the 300 km Hatf-3 or Ghaznavi. After the initial phase, Pakistan managed to establish its indigenous technological base. It later produced the 200 km rage Abdali which was designated as Hatf-2 and replaced the Hatf-2 that was initially developed. Abdali was first tested in 2002.[32] In April 1998, Pakistan tested its liquid-filled MRBM Hatf-5 or Ghauri with 1300 km range. For the first time, this provided Pakistan the capability to reach many targets in India's heartland. This not only enhanced Pakistan's deterrent vis-à-vis India but

[28] Feroz Khan et al, "A Missile Stability Regime for South Asia."
[29] Mistry, "South Asia's Missile Expansion."
[30] Salik, *The Genesis of South Asian Nuclear Deterrence,* 207.
[31] Rodney Jones, "Pakistan's Nuclear Posture: Quest for assured nuclear deterrence – A Conjecture," Institute of Regional Studies, Islamabad, *Spotlight on Regional Affairs,* vol. XIX, no. 1(January 2000),10.
[32] Salik, *The Genesis of South Asian Nuclear Deterrence,* 208.

also constituted a counterpoise to India's Agni missile, tested a decade earlier.[33]

This was followed by testing of a more sophisticated version of Ghauri, and the test of the Shaheen-1 missile with 700 km range on April 15, 1999.The test was timed as a response to India's 2000 km range Agni-2 test on April 11, 1999, just four days earlier. After further testing, Ghauri and Shaheen-1 were inducted into the Army's Strategic Forces Command (ASAF).[34] The 290 km range Ghaznavi/Hatf-3 was first tested in May 2002 during the peak of a military crisis with India and inducted into the ASAF in February 2004.[35] Pakistan tested its longest-range missile (2000-2500 km) Shaheen-2/Hatf-6 for the first time in March 2004.[36]

Pakistan first tested its surface-to-surface ballistic missile (SSM) Ababeel in January 2017. It has a range of 2200 km and can deliver multiple warheads using MIRV technology. This means that the missile can engage multiple targets with accuracy and can defeat enemy radars. An Inter-Services Public Relations (ISPR) press release stated that the missile was developed to ensure survivability of Islamabad's missiles in the face of Indian BMD threat.[37] Many of Pakistan's later missiles have been developed to evade or defeat Indian BMD which is a great source of concern for Islamabad.

Pakistan came under immense pressure to respond when India started developing its supersonic cruise missile, the BrahMos, in cooperation with Russia. Subsequently, Pakistan started working on a cruise missile of its own and developed Babur/Hatf-7 which it first tested in August 2005 with a 700 km range. It has been in service with the Pakistan Army since 2010. It is a land-based subsonic missile capable of carrying both conventional and nuclear warhead. It is a low-flying, terrain-hugging missile which is designed to avoid radar detection and penetrate the enemy's missile defence

[33] Ibid.,210.
[34] Ibid.
[35] Feroz Hassan Khan, *Eating Grass: The Making of the Pakistani Bomb* (Stanford: Stanford University Press, 2012), 240.
[36] Salik, *The Genesis of South Asian Nuclear Deterrence,* 210.
[37] Pakistan Conducts First Flight Test of Ababeel Surface-to-Surface Missile," *Dawn*, January 24, 2017.

systems.[38] It also incorporates the latest cruise missile technology of Terrain Contour Matching (TERCOM) and Digital Scene Matching and Area Co-relation (DSMAC). It used a multi-tube Missile Launch Vehicle (MLV) during the test which provides a major force multiplier effect for target employment and survivability.[39] Later, Pakistan also developed an Air Launched Cruise Missile (ALCM) Raád/Hatf-8 with 350 km range and conducted its first test in August 2007. It has been tested from Pakistan's Mirage-III fighter jets and is a low-altitude, terrain-hugging missile which is highly manoeuverable, has stealth capabilities and accuracy that according to ISPR statement helps "enable it to avoid detection and engagement by contemporary air defence systems."[40] The western analyses of South Asia missile developments also suggest that "... a driver of Pakistan's cruise missile programme is the perceived need to have the capability to penetrate future Indian missile defenses."[41]

Pakistan also developed a tactical ballistic missile, Nasr, that is both conventional and nuclear capable. It was tested in April 2011 and has a range of 60 km. It was developed as a response to India's Cold Start Doctrine (CSD) which envisages a limited war just below Pakistan's nuclear threshold. Pakistan sees Nasr as essentially a defensive weapon which strengthens its conventional deterrence. It is meant to deter Indian conventional attack at the tactical level, thus providing Full Spectrum Deterrence.[42] Developing a Tactical Nuclear Weapon (TNW) is also a response to the Indian BMD. The comments by the former Foreign Office Spokesman, Aizaz Ahmad Chaudhry are indicative that TNW and cruise missiles were developed in response to three concerns vis-à-vis India: "increasing conventional weapons' asymmetry; India's offensive doctrine

[38] Feroz Hassan Khan, *Eating Grass*, 247.
[39] "Pakistan Test Fires Nuclear-Capable Hatf-VII Babur," *Express Tribune*, September 17, 2012.
[40] "Pakistan Successfully Tests Ra'ad Cruise Missile: ISPR," *Dawn*, January 19, 2016.
[41] Toby Dalton and Jaclyn Tandler, "Understanding the Arms Race in South Asia," September 13, 2012, http://carnegieendowment.org/2012/09/13/understanding-arms-race-in-south-asia-pub-49361
[42] Ghazala Y. Jalil, "Tactical Nuclear Weapons and Deterrence Stability in South Asia: Pakistan's Stabilisation-Destabilisation Dilemma," *Strategic Studies*, vol.34, no.1 (Spring 2014).

and development of Ballistic Missile System."[43] This is ample indication that the Pakistan TNW and cruise missiles were developed in response to threats from New Delhi. Essentially, TNW are one way to defeat the Indian BMD. The short-range and flight time give very little time for the BMD system to detect and launch interceptor, thereby providing a greater chance that it will get through a missile defence shield.

In response to India's development of a sea-based nuclear and missile capability, Pakistan also initiated efforts to develop a sea-based nuclear deterrent. In 2012, it established the Naval Strategic Forces Command which would be responsible for the defence and protection of naval and naval nuclear assets. In January 2017, Pakistan tested Babur-3 which is a Submarine-Launched Cruise Missile (SLCM). Babur-3, with a 450 km range is a sea-based variant of Babur-2 which is a ground launched missile, was tested from a submerged mobile platform in the Indian Ocean.

The ISPR press release stated that the missile was designed to avoid detection by hostile radars and air defences in a regional BMD environment.[44] While the military said that "the successful attainment of a second-strike capability by Pakistan represents a major scientific milestone; it is manifestation of the strategy of measured response to nuclear strategies and postures being adopted in Pakistan's neighbourhood."[45] These statements provide a clear indication that Pakistan's sea-based nuclear capability is a direct response to India's. The development of Babur-3 and other cruise missiles is especially aimed at defeating India's ballistic missile defence systems. Babur 3 is aimed at stabilising deterrence as a response to India's sea-based missiles K-4, K-15, Dhanush, BrahMos, and Nirbhay. The SLCM gives Pakistan a rudimental second-strike capability, however, due to limited economic resources, Pakistan is constrained in its nuclear capabilities at sea in comparison to India which has an ambitious naval nuclear capability.[46]

[43] "Pakistan Considers India's Ballistic Missile System as Destabilising Development: FO," *Nation*, May 9, 2013.
[44] "Pakistan Gains Second-Strike Capability," *Express Tribune*, January 10, 2017.
[45] "Pakistan Test Fires Nuclear Capable Submarine Launched Cruise Missile," *Dawn*, January 10, 2017.
[46] The Indian Navy is developing 3-6 indigenous Arihant class SSBN. One submarine has already been commissioned. India has also plans to build 6 nuclear attack submarines (SSN). It is trying to acquire another Akula-class submarine on lease from Russia. It has developed a range of missiles that can be deployed at sea

In short, Pakistan's missile programme was initiated and developed in response to India's missile capabilities. The programme is primarily driven by its security imperatives and threat perceptions. It has mostly been playing "catch up" to India's missile developments. Pakistan has reiterated on several occasions that it was not interested in getting into an arms race with India. However, the Indian threats have been instrumental in driving the development of Pakistan's nuclear and missile programmes.

Impact on Deterrence and Strategic Stability

The action-reaction spiral that is the characteristic of India and Pakistan missile and nuclear programmes is destabilising for the regional peace and security. The systems like India's missile defence are especially destabilising for nuclear deterrence and overall for strategic stability in the region. Deploying a BMD makes India theoretically invulnerable to a ballistic missile attack, thus affecting the credibility of Pakistan's nuclear deterrence. It would also encourage first-strike tendencies on India's part whereby it can launch a nuclear attack in order to eliminate most of Pakistan's nuclear forces and absorb any remaining counterattack through its BMD. In my earlier research work on Indian BMD, I have arugued that possession of missile defence systems increases the effective resolve of India.[47] It means that New Delhi is likely to indulge in brinkmanship and take risks in a conflict in order to dominate, secure in the knowledge that if it comes to a nuclear exchange, it would be shielded by the missile defence.

Also, as the effectiveness of India missile defence system increases the likelihood of an attack on Pakistan would also increase, causing great instability.[48] Pakistan has introduced qualitative and quantitative measures to its nuclear and missile arsenal in order to deal with instability emanating from BMD. Nasr also, in part, is Pakistan's response to India's BMD. Pakistan's missiles like Babur, Raad, Ababeel with its MIRV capability, and Nasr are all a response to Indian BMD. Therefore, for Pakistan, these missiles are stabilising and designed to restore the credibility of its nuclear deterrent. At the same time, the need to develop these systems would not have arisen had India not gone for the destabilising BMD in the first place.

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including K-4, K-5, K-15, Dhanush, BrahMos and Nirbhay, giving it a good second strike capability.

[47] Ghazala Yasmin Jalil, "Indian Missile Defence Development."

[48] Ibid.

Pakistan's response, in turn, threatens India and thus the action-reaction cycle of development of arms and weapons system continues.

Development of the TNW, Nasr, is stabilising for deterrence from a Pakistani perspective. However, the need to develop Nasr would not have arisen if India had not adopted CSD. The doctrine essentially aims to fight a quick, limited conventional war just below Pakistan's nuclear threshold. Plugging the gap between conventional and nuclear deterrence is therefore a stabilising factor for Pakistan. With the short-range missile Nasr, Pakistan faces a dilemma of deterrence stability. As noted by this author in one of her earlier works, "The pursuit of TNW presents a stabilisation-destabilisation dilemma for Pakistan. While demonstration of TNW capability may be stabilising for Pakistan...the actual deployment and use of the weapons in the battlefield is destabilising."[49] The battlefield deployment risks preemption, accidental use, and command-and-control issues which are destabilising for deterrence.

Another destabilising factor in South Asia is the dual nature of the missiles. Many missiles in India and Pakistan's inventory can be used in a conventional or nuclear role. This complicates signalling by creating uncertainty for the adversary. The adversary cannot be sure if missiles being prepared for the launch are nuclear or conventional. This could lead the adversary like India to avoid taking risks such as penetrating Pakistani territory or crossing the Line of Control or other aggressive actions. It could also lead to another scenario whereby an adversary, perceiving the other side to be preparing for a nuclear launch, could launch a pre-emptive attack in order to eliminate the enemy's nuclear assets. Dual-capable missiles can, thus, be destabilising in the current strategic environment of South Asia.

During the Pulwama crisis of February 2019, India threatened to use missiles against Pakistan and the latter responded that it would respond in kind.[50] The dual-use nature of their missiles would have escalated the crisis. Even deployment of conventionally armed missiles could have escalated the

[49] Ghazala Yasmin Jalil, "Tactical Nuclear Weapons."
[50] Moeed Yusuf, "The Pulwama Crisis: Flirting With War in a Nuclear Environment," *Arms Control Today*, May 2019, https://www.armscontrol.org/act/2019-05/features/pulwama-crisis-flirting-war-nuclear-environment

crisis to a nuclear exchange. Deployment of dual nature missiles, thus, can be very destabilising in the South Asian context.

The other destabilising factor is New Delhi's introduction of nuclear weapons in the Indian Ocean. India has developed fairly sophisticated naval nuclear and missile capability which gives India a second strike capability and tips the balance in its favour. This eventuality has forced Pakistan to develop second strike capability of its own. This has only extended the missile race to the Indian Ocean.

There are several issues regarding the introduction of nuclear tipped missiles at sea. It is premised on the thesis that a second strike capability helps achieve strategic stability. However, this conventional wisdom may not be effective in the context of India and Pakistan. In South Asia, nuclear arms racing has more to do with sub-conventional and conventional attack escalating into a nuclear exchange rather than a nuclear first strike. Given these dynamics, Indian naval nuclear missiles would not add much deterrence value against Pakistan in any meaningful way.[51] India professes threat from non-state actors, while Pakistan uses its nuclear capability to counterbalance the Indian conventional superiority as well as plug any gaps for CSD inspired limited war plans by India. Acquiring and deploying a sea-based nuclear capability does not solve either India or Pakistan's problems. A second strike capability at sea would not stabilise deterrence. Moreover, it is likely that even after achieving a second strike capability, the two countries would continue on the path of conventional build-ups and the pursuit of advancements in nuclear warheads and missile systems

Secondly, there are many issues associated with developing and deploying underwater nuclear assets which increase the risk of misperception, escalation and unauthorised or accidental use. In the South Asian context, underwater deterrent is likely to increase instability. The most serious issue is that of command and control that threatens to destabilise deterrence. As one expert on India, Vipin Narang, has pointed out that an operational SSBN force would compromise the civilian control over Indian nuclear forces. On land, India's nuclear weapons are kept under civilian control in peacetime and even in times of crises. This mitigates the

[51] Diana Wueger, "Deterring War or Courting Disaster: An Analysis of Nuclear Weapons in the Indian Ocean," Thesis published by the Naval Postgraduate School, 66, March 2015, http://hdl.handle.net/10945/4527

risk of unauthorised nuclear use.[52] Diana Wueger calls it the "always never dilemma." This essentially means that, at sea, the weapons need to be in ready to use state but have the increased challenge to prevent unauthorised or accidental use. At sea, communication with civilian leadership cannot always be certain, increasing the likelihood of unauthorised launch in times of crisis.

On a submarine, a missile would need be mated with the warhead which is contrary to the policies both India and Pakistan follow at land whereby missiles and warheads are de-mated and stored separately. Once the weapons have been mated, it increases the chances of miscalculations and inadvertent use. This brings yet more instability to an already volatile nuclear armed South Asia. One Pakistani expert expresses reservations with India's command and control structure and the risk of misperception and unauthorized launch. He further argues that India with an assured second strike capability, and the false sense of security provided by BMD system is likely to adopt a more aggressive posture towards Pakistan, China and other countries in the region, thus, creating more instability and further arms racing tendencies.[53] Pakistan's Foreign Office has already voiced its concerns with India's operationalisation of it naval nuclear force.

Pakistan's Security Challenges

Pakistan's primary challenge is to strike a balance between its security needs while at the same time avoid getting bogged down in a costly arms race. Above all, the strategic culture in the Subcontinent needs to be changed. Pakistan needs to shake off the India-centric security outlook and realise that it cannot get into an arms race with India whereby it matches weapon for weapons, missile for missile in the nuclear or conventional field. India is a large country with a huge economy and a matching defence budget that is many times larger than Pakistan's. India has ambitions for a regional and global power status, while Pakistan is only concerned with its security against a hostile India. Pakistan needs to maintain a missile capability and a nuclear force that would safeguard its sovereignty against India instead of reacting to each weapon system it develops. If the partial

[52] Vipin Narang, Nuclear Strategy in the Modern Era: Regional Powers and International Conflict (Princeton University Press, 2014), 105.
[53] Zafar Ali, "Nuclearisation of the Indian Ocean Region," *Express Tribune*, May 28, 2016.

purpose behind India's major weapon systems like the missile defence and sea-based nuclear capability is to engage Pakistan in an economically ruinous arms race, then Pakistan must safeguard against falling in that trap. The US engaged the Soviet Union in such a race during the Cold War which led to the collapse of the latter. Pakistan must avoid going down the same road.

A minimum nuclear deterrent comprised of hundred or so warheads and delivery systems that can target all of Indian territory, and a rudimentary second strike capability should be enough to deter India. However, it is a difficult balancing act trying to preserve nuclear deterrence and avoiding an arms race. Technological innovations are increasingly eroding the integrity of nuclear deterrent. This includes the use of Artificial Intelligence in warfare and dedicated military satellites that provide the possessor states tremendous advantages in terms of navigation, intelligence and reconnaissance.

There is a need to reduce tensions between India and Pakistan. India needs to ease up on its conventional build-up, nuclear and missile programmes which Pakistan sees as a threat. Also, Pakistan needs to be proactive in countering Indian propaganda which aims to brand Pakistan as a state that is sponsoring terrorism in various international forums. At the same time, Pakistan needs to put concerted efforts in improving its image internationally. The two countries need to ease tensions in the region by improving relations and need to revive bilateral talks that have been stalled since 2008. They eventually need to move towards conflict resolution. They need to target the root causes of insecurity and arms conflict. One of the poorest regions in the world, South Asia needs to invest less in armament and more in human development.

India and Pakistan need to work on a Strategic Restraint Regime (SRR). Over the years, Pakistan has made many proposals for SSR including establishment of a nuclear weapons free zone. In the aftermath of 1998 nuclear tests, Pakistan again proposed a SRR comprising three elements ─ nuclear restraint to preserve deterrence, a conventional balance and conflict resolution. It was rejected by India and later in 2016

Pakistan again proposed such regime but was met with rejection again.[54] The two countries need to have some crisis management mechanisms. India and Pakistan have some confidence-building measures (CBMs) in place and need to build on them. Some of the CBMs in place are the regular exchange of lists of their respective nuclear installations and agreement for non-attack on them; and agreement on pre-notification of ballistic missiles tests. Some possible CBMs the two countries can negotiate on are: Agreement for advance notification of tests of cruise missiles; agreement on avoiding incidents at sea; and some concrete steps for negotiating Ballistic Missile Treaty for South Asia that sets limitations on the development and deployment of missile defence systems.[55] Also, since the two countries are fielding nuclear deterrents at sea, they need have some CBMs to avoid accidental or unauthorised launches.

Conclusion

There is indeed an action-reaction dynamic involved in the genesis and subsequent development of missile and nuclear programmes of India and Pakistan. New Delhi started a missile programme, Islamabad followed suit to meet the security needs of the country. India developed BMD; Pakistan reacted by diversifying its missile systems by developing cruise missiles, and MIRVing technology. India developed a sea-launched nuclear capability, Pakistan responded by developing Babur-3. India introduced Cold Start doctrine, Pakistan responded by developing TNW Nasr to plug the gap between conventional and nuclear deterrence. While the arms race is overall destabilising for the region, individual systems like Nasr, Babur-3 and systems that can defeat Indian BMD bring stability for Pakistan. Arms races are destabilising, and it is in the interest of both India and Pakistan to avoid such a trap. For Pakistan, the challenge is to strike a balance between its security needs and the fallacy of falling into an arms race that may be ruinous for the country.

[54] Asma Khalid "Significance of Strategic Restraint Regime in South Asia," *Foreign Policy News*, July 15, 2017, https://foreignpolicynews.org/2017/07/15/significance-of-strategic-restraint-regime-in-south-asia/

[55] Salik, "Strategic Stability," 14.