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Understanding the Nuclear Landscape in Southern Asia: Complexities and Possibilities

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Abstract

The nuclear playground in Southern Asia is marked by an exceptional level of complexity. A number of players; their disparate thinking on how to establish deterrence; nuclear dyads that elongate into strategic chains; inter-twining of nuclear issues with conventional, space, cyber realms; disparities in military capabilities; historical animosities accentuated by unresolved territorial conflicts; divides that spawn ideologies, religions and civilisational issues; all make for an immensely complex situation. The consequent regional nuclear dynamics has fair potential for crisis and arms race instability. As a way to address the regional nuclear challenges, the paper explores the character of Pakistan–India and China–India nuclear dyads along three specific axes: drivers of conflict; points of commonalities, similarities and differences; and implications of these for their nuclear stockpiles. Armed with this understanding, it then offers some policy recommendations to address the concomitant dangers.

Keywords:

Southern Asia; nuclear dynamics; strategic stability; nuclear deterrence

Introduction

The nuclear playground in Southern Asia is marked by an exceptional level of complexity. It is dotted with three geographically conjoined nuclear weapon possessors who share rather complicated relations, have an asymmetry in conventional and nuclear military capabilities and are prone to conflict over more than one issue. In comparison to this situation, the bipolar ColdWar nuclear confrontation, as dangerous as it then was, now appears to be have been simple and straightforward. Buoyed primarily by an ideological divide, it rested on a rough parity of sorts between the two Superpowers across major determinants of national power – economy, technology, military. Most importantly, the United States and USSR were geographically far apart. Nuclear deterrence between them was established on concepts that were broadly similarly understood, and it was anchored in the idea of mutual vulnerability or the ability to cause mutual assured destruction. The realms of conventional and nuclear warfare were doctrinally and technologically kept apart. Meanwhile, after the Cuban missile crisis, there emerged a shared desire, and urgency, to establish crisis stability, enabling initiation of a process of arms control.

In Southern Asia, the game of nuclear deterrence is playing out quite differently. An increased number of players; their disparate thinking on how to establish deterrence; nuclear dyads that elongate into strategic chains; inter-twining of nuclear issues with conventional, space, cyber realms; disparities in military capabilities; historical animosities accentuated by unresolved territorial conflicts; divides that spawn ideologies, religions and civilisational issues; all make for an immensely complex situation. The consequent regional nuclear dynamics has fair potential for crisis and arms race instability. And if escalation of a crisis were to occur, it likely would not climb along the steps of a well-defined and neatly erected ladder, but spill over into disparate realms to create what can be envisioned as a maze enveloped in thick fog from where finding the route to de-escalation will be tough.

In order to address the nuclear challenges crowding the region, it becomes necessary to first comprehend their character. Accordingly, this paper devotes its first three sections to exploring the Pakistan–India and China–India nuclear dyads along three specific axes: drivers of conflict; points of commonalities, similarities and differences; and implications of these for their nuclear stockpiles. The last section then concludes with some policy recommendations to address the concomitant dangers.

Drivers of Conflict

Unresolved territorial issues

Unsettled boundaries and territorial disputes between Pakistan–India and China–India are the first big driver of conflict. Territory constitutes an important, even fiercely emotive, attribute of sovereign nationhood. Nation-states do not hesitate to go to war for what they perceive as theirs and to 'right' historical wrongs. In the case of India that lies between Pakistan and China, liberation from the yoke of British colonialism in 1947 left festering territorial disputes with both neighbours. With Pakistan, the northern, princely state of

Jammu and Kashmir (hereafter referred to as Kashmir) emerged as the primary bone of contention. Fearing that the Hindu ruler of the Muslim majority state would lean towards India, Pakistan, in October 1947, mounted an offensive planned by its fledgling army. Col Akbar Khan, Director of Weapons and Equipment at Pakistan Army Headquarters was put in charge of the operation that involved "a clandestine invasion by a force composed of Pathan tribesmen, ex-servicemen and soldiers 'on leave' (Dasgupta 2002, 38). This action drove the Maharaja who had still been dithering to sign the instrument of accession with India, making Kashmir a *de-jure* part of Indian territory. India then deployed its army and air force to defend its territory. As the fighting continued, the assessment of the Indian Prime Minister by mid-December was that Pakistan was waging a regular war on India by continuing to train new armies for invasion. India, meanwhile, was following a "cautious defensive policy"[1]. Nehru concluded that if Pakistan was to be stopped from using its territories as a base, then "The obvious course is to strike at these concentrations and lines of communications in Pakistan territory" (Dasgupta 2002, 98). Unenthused by the prospect of an open war between India and Pakistan, Governor General Mountbatten insisted on a reference to the United Nations. Nehru accepted the suggestion but also argued that India "cannot ask UNO to arbitrate between raiders and Dominion of India." His decision was that as the aggrieved party, India would draw attention of the UN to the fact that Pakistan was aiding and abetting the invaders and that they should be asked to refrain from doing so. After much political play between important actors at the UN, on 13 August 1949, terms for truce were set out and the UN Commission on India and Pakistan established. The UNCIP could not succeed in its objective and the conflict over parts of J&K remains a festering issue to this day with roughly two-thirds of the territory of Kashmir being in Indian possession and the rest with Pakistan. A further complication was added to the conflict when Pakistan ceded some of this territory to China in 1963.

Since independence, Pakistan Army has made several attempts to militarily wrest the territory, as also to use religion to create insurgency in the state or mount acts of terrorism to create mayhem.[2] The line of control dividing the two sections of Kashmir is witness to frequent cases of cross border firing, a sort of normal that has existed thus for over seven decades now, with variations only in the degree of exchange of firepower.

Meanwhile, on its north and east, India has territorial disputes with China primarily over Aksai Chin and Arunachal Pradesh (Singh, J. 2013, 79). Historically, the China–India border dispute emerged after China's communist government took control of Peking in 1949 and sought to consolidate China's borders. The absence of clearly defined international boundary in these areas from the time of the British empire created ample room for misinterpretation. Over decades, this has resulted in cross-border incursions and mutual accusations of illegal presence of each other's troops in territory claimed by the other. After a political rapprochement of sorts was enabled by the visit of PM Rajiv Gandhi to China in 1988, agreements to manage the territorial issues were put into place in the early

[1] Words used by PM Nehru himself in his communication with Lord Mountbatten. For details, see Dasgupta (2002, 102).

[2] Pakistan's support for insurgencies in India – "the Naga insurgency from East Pakistan in the 1960s, Sikhmilitancy in the 1980s, and, a proxy war through the training, equipping, and infiltration of terrorists intoKashmir in the name of "jihad" in the 1990s" – is no secret. See Sood (2021, 9).

1990s. These were also periodically updated when new problems arose[3]. The apparent emphasis by political leaders on both sides through the next two decades was on domestic economic growth and bilateral economic cooperation, and to not let the border skirmishes get out of control.

This arrangement, however, appeared to have suffered a serious blow in April–May 2020 when Indian and Chinese soldiers violently clashed in Galwan valley. Fatalities occurred on both sides for the first time since 1962. In fact, between 1962 and 2012, only two major incidents had taken place – one in 1967 in Nathu La and Cho La and the other in 1975 in Tawang.However, the frequency of skirmishes was beginning to increase sharply from 2013 onwards[4]. The Doklam standoff in 2017 was the first major friction and the 2020 incident subsequently caused a sharp downturn in India–China relations. Speculations on why China triggered such an incident in 2020 spawn a range of possibilities. These include reasons as diverse as Chinese anger at India's revocation of Article 370 in August 2019 that resulted in change of status of the state of Ladakh; development of border infrastructure on the Indian side that led to more chances of soldiers of both sides meeting each other during patrolling; China's propensity to display aggressive behaviour, which was evident across many theatres from mid-2010s as Xi Jinping sought to assert his country's position as a global power.

Whatever may have been the Chinese motivation for disturbing the agreements on peace and tranquility with India at the Line of Actual Control, the outcome of this has been to cause a fracture in their political relationship. Since April 2020, both sides remain in a high state of mobilisation on the Himalayan heights. While military negotiations continue to defuse tensions, the overall relationship today suffers from high mistrust and suspicion, which will not be easy to dispel. Unsettled border issues will continue to remain a driver of conflict and the potential for crisis will only be exacerbated by lack of political engagement.

Use of terrorism by one nuclear-armed state against another

It is a rather unique feature of Southern Asia that one nuclear-armed country resorts to the use of cross-border terrorism against another nuclear-armed State. Pakistan has used the weapon of '*jihad*' to continually mount low-intensity conflict against India through terrorist organisations that it nurtures and sustains as its proxies. Some of these are on UN-designated terrorist lists.[5] Pakistan's possession of nuclear weapons by the late 1980s further emboldened it since its nuclear weapons were perceived as a shield against the possibility of a punitive Indian response. Since then, Islamabad has routinely ratcheted up the fear of nuclear escalation at the breakout of every crisis created by an act of terrorism.

India, however, has refused, over time, to absorb these provocations without resorting to some form of punitive retaliation. Indian surgical strikes in 2016 in response to the

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[3] For instance, the Border Peace and Tranquility Agreement of 1993 and 1996 were buttressed with more instruments in 2005, 2012 and then the Border Defence Cooperation Agreement in 2013.

[4] For an analysis of incidents, see Bose (2018).

[5] Former Pakistani President and Chief of Army Staff Pervez Musharraf has acknowledged this in several interview, the most recent being the one in November 2019 (Economic Times 2019). For details on the monies spent by Pakistan's intelligence agencies on transnational arms supplies, see Singh, J. (2013, 122).

terrorist acts against the military in Uri and the air strikes in 2019 after the suicide attack on para-military forces in Pulwama were military actions that went contrary to Pakistan's assumptions. As the Pakistani prime minister escalated the nuclear rhetoric around the 2019 strike in Balakot, explicitly evoking the spectre of nuclear war in the region (Jaffery 2019; Lewis 2019), the Indian PM too responded by drawing attention to Indian nuclear weapons. Rather uncharacteristically, India too chose to manipulate the risk of escalation this time and publicly announced the deployment of its sea-based nuclear assets. While all of this was part of coercive diplomacy and the incident in 2019 eventually wound down for many fortuitous reasons (Tasleem 2019), future crises created by the continued support of terrorism by Pakistan may not follow the same template.

Also worrisome is Pakistan's risk-prone nuclear strategy that projects deployment of tactical nuclear weapons. While Pakistan considers them an important element of its strategy to deter India's conventional riposte, the risk from such deployments in a country that has the acknowledged and continued presence of terrorist organisations[6], some of whom have been known to have attacked Pakistan's own sensitive military establishments[7] cannot be underestimated. Rather, it raises the possibility of inadvertent nuclear use due to miscalculation or accident in case of a crisis.

Perception of each other's relationship with third countries

The shadow of third countries from the region or beyond on the two individual dyads could prove to be another driver of conflict. In the case of Pakistan–India, the United States was the primary outsider during the Cold War which had an influence on the region. In the case of Pakistan, the United States was an ally as part of SEATO and CENTO. With India, however, the relations with the United States were far more complicated owing to its emphasis on non-alignment, as well as some periods of cooperation with the United States, and some with the USSR. Also, India was never happy with the United States complicity in letting Pakistan develop a nuclear weapons capability, including by turning a blind eye to its nuclear and missile nexus with China. Much of this history is available in publications based on archival research (Levy and Scottt-Clerk 2007; Corera 2009). US tendency to ignore Pakistan's nuclear excesses made Washington appear to India as an unfair broker in a bilateral crisis while Islamabad was keen to solicit its arbitration.

This situation, however, changed with the recent souring of US–Pakistan relations in 2018 when then US President Donald Trump accused Pakistan of "lies and deceit" (Afzal 2022) and cut off US Congressional aid to Pakistan. While Pakistan is still trying to reset its relations with the United States, China's ominous shadow on the India–Pakistan relationship has meanwhile significantly increased. The Sino–Pakistan connect goes back several decades as both found common cause in their individual hostility towards India. In

[6] One indication of continued presence is the Financial Action Task Force maintaining Pakistan on the Grey List,owing to its insufficient compliance with measures to address the problem of terrorist networks in its territory (Ahmed 2014).

[7] Recall the attack on Pakistan naval base PNS Mehran in May 2011 by TTP and Al-Qaida; attempted hijacking of PNS Zulfiqar in 2014 by a young naval officer that indicated militant infiltration into Pakistani Navy (Singh, A. 2019).

recent years, the China–Pakistan Economic Corridor (CPEC) which comprises a number of development projects by China in Pakistan has expanded cooperation into new domains. These include energy cooperation (including nuclear), infrastructure development, defence research and development, and even managing Afghanistan. It may be recalled that the two had already joined their geographies in 1963 when Pakistan handed over Shaksgam valley, part of the disputed territory with India, to China. CPEC projects and the Karakoram Highway run through this area. India sees this partnership as an effort to encircle and contain it, especially in wake of its own deteriorating relations with both neighbours that have fueled threat perceptions of a two-front war. Such a collusion could happen in many ways. For example, one side taking advantage of a crisis with the other to achieve its own objective; or both coordinating their moves in case of a crisis to distract and divide Indian forces. While there is no evidence of past such behaviour, India perceives that it cannot be ruled out in the future given the increased strategic alignment between the two.

India has sought to hedge against the China threat by increasing its partnerships with other countries that also perceive a heightened threat from China. The focus on the Quadrilateral Security Dialogue (Quad) involving the United States, Japan, Australia and India, emerges from here. That China is the primary driver of Quad is clear from the fact that though the initiative had first been floated in 2007, it had faded out soon thereafter since the China threat was not very palpably felt then. It has since been revived in keeping with China's aggressive and expansionist behaviour. India conceives the Quad not as an exclusive alliance, but an inclusive effort at partnership with other compatible states too. New Delhi would prefer that the grouping succeeds as a global and regional force for good on common concerns than crystallize into a military alliance. This, however, will be determined by China's own behaviour.

On its part, Beijing's uneasiness with the Quad has been evident from its statements (Rudd 2021). It decries the initiative for harbouring a Cold War mentality. For China, India's growing closeness to the United States, including the conclusion of some bilateral agreements such as the Logistics Exchange Memorandum of Agreement (LEMOA) in 2016 and Communications Compatibility and Security Agreement (COMCASA) which facilitate interoperability between militaries and sale of high-end technology, is a matter of concern. This is especially so when Beijing's own relationship with Washington seems to be worsening. It may be recalled that the war waged by China against India in 1962 had been described by Chairman Mao Zedong as a way to 'teach India a lesson' for drawing too close to USA (Singh, J. 2013, 7).

Overall, then, nations' perceptions of each other's relations with third parties can become a driver of conflict, especially if these are seen through the zero-sum prism. The risk is exacerbated when the intention of the other is doubted, as is discussed in the following section.

Perceptions of each other's intent

It is not unusual that adversaries make worst-case assumptions of each other and their intentions. Such a situation can be seen in the case of the two nuclear dyads in Southern

Asia.The Pakistan–India nuclear relationship has long suffered from a lack of trust owing to their historically deep-seated hostility. The two-nation theory advocated by Muslim leader, MA Jinnah, was premised on an impossibility of co-habitation of Hindus and Muslims. Fearing for the Muslims in a Hindu-majority state, he sought a separate state from the British. Since its creation, Pakistan has sought its identity in religion, which however has not proven to be the kind of glue that it was imagined to be. This became clear with the break-up of Pakistan and the independence of Bangladesh, despite their common bond in Islam. Continued atrocities against Muslim minority sects in Pakistan has further questioned this assumption.

While Pakistan argues that a resolution of the Kashmir conflict would normalise India–Pakistan relationship, India believes that the problem is more deep-seated, arising from Pakistan military's view of India as an existential threat. This perception has been created and sustained by the Pakistan Army in order to maintain its domination over the state and its instruments. Meanwhile, the growth of the political right in India under the present political dispensation has provided Pakistan with more ammunition to fuel disaffection between the two communities. As pointed out by Rakesh Sood,

> Some of the recent Hindutva-tinted rhetoric from the Bharatiya Janata Party (BJP) in India only serves to convince the Pakistan military that India's secularism was always a sham and that it is just a matter of time until the liberal-secular urban elite in India will be marginalized and yield to the majoritarian Hindu impulse (Sood 2021, 10).

Pakistan uses this rhetoric to its advantage by seeking to create religious fissures even though the reality is that over the years, the Muslim population in India has grown from 10 to 14 percent, while the Hindu population in Pakistan has shrunk from 12 to 2 percent. The perceptions of each other, however, lead to mistrust that could become a driver of conflict.

In the case of India and China, the relationship has become far more complicated in recent times. Despite their territorial disputes and unsettled nature of the line of actual control, the perception of China in India was far more benign until 2017. Indian populace even looked at the country with awe for its rapid economic growth and cheap Chinese goods that were liberally consumed in India. The predominant public perception was that a decent working political relationship had been established and that growing economic engagement (China is India's largest trading partner) would enable resolution of more thorny border issues in time. On the nuclear front, there was a sense of stability owing to the similarity of their no-first use doctrines that exhibited a sameness of approach to nuclear weapons, which was quite distinct from the Western view.

India's perception of China, however, changed quickly as news poured in of the killing of around 20 Indian soldiers by Chinese troops using batons and clubs wrapped with barbed wire. It did not help matters that the country was already struggling with the Covid health emergency that was being attributed to China by many countries. All of India supported the government in banning Chinese apps, boycotting Chinese goods, and encouraging a strong military response. China is today widely perceived as an expansionist country with aggressive designs. The inability of several rounds of military negotiations to achieve a

mutually acceptable outcome has led to hardening of positions on both sides. In China too, many editorials of *Global Times*, the mouthpiece of the People's Liberation Army (PLA), have adopted a threatening tone towards India. While economic and trade relations continue, a visible crack has occurred. Misperceptions of each other's intent could snowball into a driver of conflict.

Points of Commonalities, Similarities and Differences

In Southern Asia, the triangular relationship between the three nuclear actors translates into two adversarial nuclear dyads: India–Pakistan and India–China. A third nuclear dyad, Pakistan–China, exists as a strategic partnership with widespread cooperation on nuclear and missile capabilities (Paul 2003). India's nuclear threats arise from both sides of its border. For Pakistan, India is the only nuclear threat. Meanwhile, Chinese strategic calculations prioritise the United States. Hence, the nature of the nuclear dynamics manifests itself in a complex nuclear chain that actually comprises four States (Brooking Institute 2017).

The uniqueness of this situation sharply emerges when one identifies points of commonalities amongst the three regional nuclear players, explores the nuclear-specific similarities, and the differences in the context of the two adversarial dyads. Mapping these can be a useful exercise to find issues on which breakthroughs may be possible at the bilateral, trilateral or plurilateral level to make the region less conflict prone.

Commonalities

Occupying a common geographical space in Southern Asia, China, India and Pakistan also share a common history of colonial rule, which stripped China and India (Pakistan was then part of India) of their robust economies in the late 1700s. China enjoyed over 30% of the global manufacturing output and India accounted for 24% of it in the early 18th century when East India company began to establish itself in India (Singh, J. 2013, 15). There are reports of thriving trade between the two advanced civilisations of China and India (Khanna 2007; Tampi 2007). Both are keen to return to some of that lost economic profile.

With India's partition, the three countries became sovereign nations roughly around the same time in the late 1940s. In the first few decades of independence, the three struggled with common nation building issues – challenges of de-industrialisation, poverty, under-development, high rate of population growth, and low human index indicators of education, health and sanitation. As economic growth picked up, constraints on availability of technology and resources also became a common challenge. More recently, the three face the common concern of climate change as manifested in increased frequency of adverse climatic events. Issues related to water, education, environment and population also resonate along similar lines across the three countries to cause common stresses. Despite common challenges that have made it prudent for the three to adopt common positions on some issues such as climate change mitigation strategies or even their approach to the recent Russia–Ukraine conflict, the overall Pakistan–India, China–India political relations have remained marred by a lack of trust and absence of a strategic

dialogue. So, for instance, while the three are on the same side on the issue of need for climate finance and technology transfers to address challenge of climate change risk mitigation, they do not make any effort to forge a joint front amongst themselves, or taking along some other countries of South Asia, given that they together represent a large part of global population.

Nuclear similarities

Pakistan–India

Despite the fact that India and Pakistan perceive a nuclear threat from each other, they have held similar positions on many nuclear treaties related to non-proliferation and disarmament. This is most evident in the decision to remain outside the NPT. While India objected to the discriminatory nature of the treaty, Pakistan expressed that it would sign the treaty only if India would do so. Their motivations for remaining away from the NPT may have been different but they share the similarity of being outliers. Both conducted their nuclear tests around the same time in 1998 and declared credible minimum deterrence as their goal. Of course, Pakistan has since moved on to full spectrum deterrence.

A similarity can be found in the origin of the nuclear power programmes of India and Pakistan. Both were beneficiaries of the US Atoms for Peace initiative and also suffered a break in that assistance when the Nuclear Suppliers Group came into being. Given their non-NPT status, their programmes are not subject to full-scope safeguards under the IAEA. Their strategic programmes remain unbridled by any kind of arms control – fissile material production continues; and both have been annually adding roughly similar number of nuclear warheads to their arsenal, as projected by estimates in the *Nuclear Notebook* of the Bulletin of Atomic Scientists (Bulletin of Atomic Scientists 2022) or SIPRI yearbooks.

Another similarity can be seen in the value both perceive from existing nuclear CBMs. Despite these not having wholly contributed to trust or confidence building, owing to the frequent disruption of political relations by Pakistan-sponsored terror incidents in India, both sides have seen merit in retaining existing CBMs. For instance, lists of civilian nuclear facilities have been consistently exchanged at the start of every new year since 1988. Similarly, ballistic missile tests have been pre-notified. The United States and Soviet Union/Russia is the only other dyad that follows this practice. India and Pakistan also have a unique agreement pertaining to notifying the other in case of accidents involving nuclear weapons. First concluded in 2007, this has been extended every five years since then and remains in force. While the appetite for more agreements remains low given the current circumstances, there does seem to be a desire to at least hold on to the existing measures.

China–India

The most significant nuclear similarity between China and India lies in their espousing a purely defensive, narrow role for their nuclear weapons. Both subscribe to the view that these weapons are necessary only for safeguarding themselves against nuclear blackmail or coercion. Their publicly announced nuclear doctrines do not signal the use of nuclear

weapons for conventional contingencies. Rather, both have underscored nuclear weapons as being best suited for deterrence by punishment. This has led them to accept 'No First Use' (NFU) nuclear doctrines. Accordingly, their arsenal build-up is focused on capabilities that would ensure survivability of retaliatory forces. Though some discordant voices have been heard in both States on continuance of No First Use, these are non-official. NFU remains the official, declared policy of both for the time being.

China and India have a roughly similar approach of caution and scepticism towards arms control. Both have suffered technology denials. More recently, American attempts at roping China into nuclear arms control negotiations have been spurned by highlighting the disparity in arsenal sizes of the two. China tends to view nuclear arms control as a trap to capture it in an asymmetric relationship. India and China have both been proponents of a world free of nuclear weapons. Both have advocated the universal adoption of NFU as one way of getting there. Both also have rejected the Treaty on the Prohibition of Nuclear Weapons (TPNW) for not taking the right approach to get to nuclear zero.

Nuclear differences

Given their disparate threat perceptions, nuclear differences between China, India and Pakistan are not difficult to find. For Pakistan, the unfavourable conventional equation with India is of paramount importance. For India, Pakistan's use of the terror and China's growing military strength and assertiveness are major concerns. Meanwhile, for China, superior American capability is the primary point of reference which drives its own capability build-up. A few major differences are explained below.

Varied role of nuclear weapons

Unlike the role of nuclear weapons adopted by China and India to primarily deter nuclear blackmail or weapons use, Pakistan sees nuclear weapons to deter conventional war with India, especially in view of its lack of geographical depth and asymmetry in conventional forces. Accordingly, it signals a low nuclear threshold and derives deterrence by propagating the nuclear weapon for 'total defence' to deter both nuclear and conventional attack and against counter-force and counter-value targets. In order to make such broad-spectrum threats look credible, Pakistan has adopted the concept of full-spectrum deterrence and is investing in requisite capabilities (Khan 2016). These include short-range ballistic missiles to carry low-yield nuclear weapons for battlefield use and also long-range missiles for counter-value targets.

Disparate methods of establishing deterrence

Pakistan prefers to project first use of nuclear weapons, including through use of tactical nuclear weapons to deter India. A strategy of brinkmanship is followed to deter India's conventional military action in response to sub-conventional acts of terrorism. It likes to play up the risk of nuclear escalation to augment deterrence (Sethi 2013; Hundley 2012a; Gregory 2011). The prospect of escalation of conflict to the nuclear level is meant to evoke fear not only to deter India, but also to scare international audiences to get involved in

conflict resolution. Therefore, as some suggest, Pakistan has a desire not for nuclear stability but "managed instability" (Hundley 2012b).

China traditionally used opacity to enhance its nuclear deterrence. It preferred to hide its nuclear numbers and capabilities and thus establish deterrence. More recently, though, China has not shied away from its capability, including silo sites, being known because it now premises its deterrence on ambiguity. Given the threat it perceives from US ballistic missile defence (BMD) and possible use of long-range strategic missiles with conventional warheads to degrade its nuclear arsenal, China has found prudence in deploying dual use delivery systems and commingling its conventional and nuclear forces at the same base to raise the risk of 'nuclear entanglement' (Acton 2018). In doing so, it seeks to deter the United States by heightening the risk that it might inadvertently hit sites where both kinds of assets are maintained, and which could be perceived as a nuclear attack, leading to nuclear escalation. The uncertainty so generated is supposed to enhance deterrence.

India establishes deterrence on the basis of a publicly articulated nuclear doctrine that offers a fair amount of transparency on the role, nature of capability build-up, employment scenarios and deployment postures of its nuclear capability. The only issue which is non-transparent is the exact number of nuclear warheads. India believes that doctrinal clarity can be an asset in terms of reducing misperceptions, and thus avoid crisis or arms race instability.

Divergent nuclear arsenal build-up trajectories

Interestingly, while the concept of credible minimum deterrence has been associated with all three countries, each has interpreted it differently. Beijing stayed true to this description for many decades as the number of its nuclear warheads was believed to stay under 250 from 1990s to 2010s. Over the last decade or so, Beijing's nuclear modernisation programmes have picked up speed and variety, including building of new silos indicating an increase in warhead numbers (Kristensen and Korda 2021a; US Office of the Secretary of Defense 2020, 59); operationalization of the new Jin class nuclear-powered submarines; deployment of multiple independently-targetable re-entry vehicles (MIRV) and perhaps manoeuvrable (MARV) warheads atop its missiles; dual-use cruise missiles; research and development of hypersonic missiles; and the expanding use of space capabilities to improve intelligence, surveillance and reconnaissance (ISR). How far these developments will take China from its long articulated minimalist deterrence strategy is unclear. Satisfied for a long time with 'minimum means of reprisal', it is showing signs of change. India is estimated to have built a stockpile of nuclear warheads of about 150-160 warheads over the last 24 years. Effort has been made towards testing and inducting missiles of variable ranges, and moving towards dispersal of delivery platforms across the triad. As per India's nuclear doctrine, the country must develop "sufficient, survivable and operationally prepared nuclear forces, a robust command and control system, effective intelligence and early warning capabilities...." [8] to ensure "maximum credibility,

[8] Article 2.6, a,b and c of Draft Report of NSAB on Indian Nuclear Doctrine, Aug 17, 1999. Available on http://www.meaindia.nic.in.

survivability...." [9] Survivability was emphasised through a "combination of multiple redundant systems, mobility, dispersion and deception" [10]. India has been moving according to this plan to build a credible arsenal and a set of requisite capabilities to meet its concept of credible minimum deterrence (CMD).

Pakistan, meanwhile, with an estimated arsenal of 165 nuclear warheads (Kristensen and Korda 2021b) has started describing its strategy as one of as "full spectrum deterrence." This appears to place importance on building a ready stockpile of nuclear warheads ranging from the low-yield to high-yield varieties, as also a number of delivery systems of the very short-range to the longer ranges to be able to target all parts of India. In recent years, missile tests of new technologies such as MIRV-ed missiles from sub-surface platforms (Ababeel), longer range cruise missiles (Babur 1B), have taken place. It has also announced a sea-based deployment of nuclear-tipped missiles on surface vessels and/or diesel electric powered submarines, ostensibly to operationalize a sort of sea-based deterrence.

Command and control of nuclear weapons – Role of military

It was on 2 February 2000 that Pakistan announced the creation of its nuclear command organisation, comprising National Command Authority (NCA), Strategic Plans Division **(**SPD), three services strategic commands one each for army, navy and air force. The army has always been the primary decision maker on matters nuclear and its predominance is reflected in the nuclear command-and-control structures too. Pakistan claims a two-man loop for authorisation of use of nuclear weapons. It maintains that it has an assertive system with no delegation of control even though this contradicts the value of possession of tactical nuclear weapons which are effective only with delegation of control for nuclear use. Pakistan is not yet credited with having a sophisticated early warning system.

In the case of China, a highly centralised, redundant and networked command-and-control system exists for its nuclear forces. The structure has recently undergone a reorganisation as part of the larger military overhaul announced by President Xi Jinping in 2015. As part of this process, the erstwhile Second Artillery Corps has been designated as PLA Rocket Forces (PLARF) and has become the fourth arm of the Chinese military alongside PLA Army, Navy and Air Force. It remains under the direct command of the Party Central Committee and the Central Military Commission (CMC), the highest and the most centralised level of military leadership in the Chinese Communist Party. The PLARF Commander is also a member of the CMC. PLARF orders are believed to be encoded and protected requiring human authentication. There is an emphasis on "man in the loop" for nuclear firing orders and in that sense, the command-and-control does not exist as a fully automated system. Also, the PLARF has control over both types of missiles – conventional and nuclear. China is also reported to be building an early warning system with help of Russia (Korolev 2020). It has also indicated an apparent focus on keeping nuclear forces

[9] Article 2.2 of Ibid.

[10] Article 3.1 of Ibid.

in a more operationally ready state as was also indicated in the 2019 White Paper on National Defence[11].

India's nuclear doctrine, as spelt out through a press note of January 2003, mandates the creation of the Nuclear Command Authority comprising a Political and an Executive Council. The former is chaired by the Prime Minister and is the sole body to authorise nuclear use. The Executive Council is chaired by the National Security Advisor (NSA) and provides inputs to the Political Council and also executes directives received therefrom. The Commander-in-Chief, Strategic Forces Command manages and administers national nuclear forces. He is responsible for training and other operational issues related to the use of nuclear weapons. The responsibility for the safe storage and reliability of the nuclear warhead rests with the Department of Atomic Energy and the delivery vehicles are maintained and controlled by the armed forces. A National Command Post, including an Alternate Command Post is catered for to ensure survivability and signal certainty of retaliation.

Desire for strategic stability

As explained earlier, the three States are focused on building capabilities in accordance with their specific versions of how to establish credible nuclear deterrence. In the process, Pakistan's strategy of nuclear brinkmanship and China's strategy of nuclear ambiguity appear less inclined towards building strategic stability. Given the tendency to see creation of nuclear risks as conducive to deterrence, there is no shared desire to maintain strategic stability as had emerged in the case of the Superpowers after the close brush with the possibility of nuclear exchange during the Cuban missile crisis. Perhaps the region has not experienced the same level of sense of danger given that the nuclear forces are not at the same level of readiness, besides being much smaller too. The relationship, therefore, exists as a difficult nuclear puzzle since there is no willingness to agree on how grave, or not, the risks are.

Need for more CBMs

In February 1999, mere months after the overt demonstration of their respective nuclear capabilities, India and Pakistan had arrived at some rather progressive nuclear confidence-building measures as part of the Lahore Memorandum of Understanding. These included provisions such as agreements to exchange information on nuclear doctrines and security concepts; advance notification of ballistic missile flight tests; prompt notification of nuclear accidents or unauthorised or unexplained incidents; bilateral consultations on security, disarmament and non-proliferation; and establishment of communication hotlines to avert crisis situations. However, even before all these points could be implemented, Pakistan's clandestine occupation of Indian territory in Kargil in May 1999 led to serious dissipation of trust. It was not until 2004 that an agreement on

[11] The full official English translation of the 2019 Chinese Defense White Paper, China's National Defense in a New Era, can be found at http://www.xinhuanet.com/english/download/whitepaperonnationaldefenseinnew-era.doc.

pre-notification on ballistic missile tests was signed, followed in 2007 by an agreement on sharing information on accidents in nuclear weapons.

Despite these agreements, the political relationship between India and Pakistan is marred by low trust and confidence. From the Indian perspective, repeated terrorist activity supported by the Pakistani State remains the biggest hurdle to stabilising the relationship. Pakistan, on the other hand, prioritises the unsettled issue of Kashmir and the perceived threat from conventional force disparity with India. There remains a huge chasm in the understanding of both sides on the issues that afflict the Pakistan–India relationship.

Meanwhile, the political relationship between China–India has also become far more difficult since 2020. In any case, the chances of the two States undertaking bilateral nuclear measures for confidence building or arms control has been low for two reasons. Firstly, China's focus is on US capabilities and it does not consider India either a potent nuclear risk to warrant such measures; secondly, China does not consider India a 'legitimate' nuclear State with whom it is willing to engage, lest this amounts to granting India nuclear recognition. Owing to these factors, the countries perceive the very need for CBMs quite differently.

Implications for Nuclear Stockpiles

Preference for platforms – Types of weapons

Differences in deterrence strategies has resulted in preference for different types of nuclear weapons and delivery systems. For instance, Pakistan's first use doctrine is crafted to deter a conventional attack from India. This inclines it towards battlefield nuclear weapons atop very short-range ballistic missile, the *Nasr*. The need for miniaturization of nuclear weapons for such missiles has also made Pakistan move towards plutonium-based weapons, even though the ones it had tested in 1998 were those with highly enriched uranium.

While these 'tactical nuclear weapons' are projected for early use to suitably deter, Pakistan does realise that these need to be backed by adequate strategic capability. Accordingly, the country has focused on more missiles of multiple ranges and capabilities. These include the short-range liquid-fueled *Ghauri* missiles, the short-range solid-fueled *Ghaznavi*, the long-range, solid-fueled versions of *Shaheens* and the MIRVed *Ababeel* missiles, which are currently under development. With the SSBN technology still out of reach, Pakistan has nevertheless sought some semblance of survivability of its arsenal by placing nuclear-tipped missiles on diesel electric submarines. Sometime in the future, Pakistan may be able to lease SSNs from China, using the precedent of the Australia–UK–US security agreement (AUKUS) announced in August 2021.[12] In the case of China and India, both have shown preference for weapon systems that can signal survivability, given their No First Use doctrines. Mobility of solid-fueled missiles, dispersal across a triad, penetrability of missiles, construction of silos and tunnels, efforts towards ballistic missile

[12] For more on this see Sethi (2021).

defence, etc have, therefore, been the preferred choices. In development and deployment of these technologies, however, China has been ahead of India. In fact, there has been a far greater sense of urgency in its nuclear capability build-up over the last half a decade or so owing to the deteriorating relationship with the United States and a progressively growing threat perception from the West.

Amongst the technological advancements that India is focusing on after having developed and deployed a number of land-based ballistic missiles, including the *Agni* variants that are solid-fueled missiles and rail and road mobile, are the long-range, canisterized *Agni* V missiles. These are currently being tested before their operational induction. Another urgent pending task is the *true operationalization* of the sea-based leg of India's nuclear triad. The commissioning of INS Arihant, India's indigenous SSBN, has marked the initiation of the journey. But an operational, credible sea-based deterrence requires a fleet of at least 4-5 SSBNs. These will also need SLBMs of longer ranges. What have been tested until now are the K-15 with a range of 700-750km and the K-4 with a range of 2000-2500km (Time of India 2014). These ranges are insufficient for credible deterrence against China and will need to go up to a range of at least 5000 kms and more to reach targets whose loss would be deemed unacceptable by Beijing. India will also have to improve the penetrability of its missiles keeping pace with China's BMD. Indian missiles will have to be equipped with increasingly sophisticated countermeasures to evade interception in order to cause unacceptable damage. Therefore, development of multiple re-entry vehicles (MRVs), which hit the same target with many bombs, and manoeuvrable re-entry vehicles (MRVs) that can drastically change trajectory to evade interception in the terminal stage, are capabilities that will help in buttressing deterrence. Though India has not tested any MIRVed missiles as of now, given the trend towards their development in the region, India would be prudent to keep options open while it focuses on other more urgent tasks towards enhancing the credibility of deterrence.

New technological developments

Maturation of technological capabilities in each of the three countries has led to new inductions. These include deployment of tactical nuclear weapons in Pakistan; deployment of MIRVed missiles by China; their testing from a sea-based platform by Pakistan; testing of canisterized missiles by India; operationalization of ballistic missile submarines by China and India; testing of rudimentary BMD by China and India; developments in space-based assets and their exploitation for navigation, communication and intelligence, surveillance, and reconnaissance; conduct of anti-satellite tests by China and India; and more recently the testing of hypersonic missiles by China and India.

An offence–defence spiral looks inevitable in the case of China–US capability build-up as each appears to be responding to the developments of the other. US BMD prompted China to invest vigorously in counter BMD capabilities, including MIRVed missiles and the more modern hypersonic delivery vehicles. The announcement of the most recent suspected Fractional Orbital Bombardment System (FOBS) test by China in Oct 2021 has already resulted in the US announcing the test of three hypersonic missiles the same month. An action–reaction dynamic is clearly evident.

Amongst the new technologies being developed by China, space, cyber and artificial intelligence for autonomous vehicles occupy centre stage. Beijing's demonstration of anti-satellite (ASAT) capability in 2007 came from the determination that this could be effectively used to counter the United States by disabling its "complex, exposed network of command, control, communications, and computer-based systems that provide intelligence [and] reconnaissance" to American forces.[13] China's endeavour is to develop capabilities that could blind US sensory and networking organs. And it appears to be pursuing this in a determined fashion through the development of a range of technologies including directed energy weapons and electronic attacks through sophisticated jamming technologies. Its cyberattack prowess has also been demonstrated a few times. Also, noteworthy has been the progress in the field of autonomous weapon systems, including the use of multiple drones in a swarm. While their weaponization is yet to occur, there is no doubt that China is moving up to a higher level of strategic capability.

India too is investing in new technologies, especially those related to better utilisation of space for military purposes. On most fronts of hypersonics, ASAT, MIRVed capability, etc., India has opted to stay at the level of R&D and refrain from provocative deployments in an attempt to keep the realms separate and avoid misperceptions and inadvertent escalation. Whether this clarity of pathways will be sustained remains a question for the future.

Policy Recommendations

The above section demonstrates the manner in which China, India and Pakistan are engaged in capability enhancement exercises. While views may vary on the actual increment in security as a result of the new capabilities, there is no doubt that the overall impact on regional security may not always positive. This makes for a complex nuclear trilemma of Southern Asia, which is not given to easy solutions. In fact, the current political climate does not offer much hope. However, since neighbours cannot shift locations, a realisation of the growing nuclear dangers with induction of new capabilities that may induce changes in nuclear postures, should persuade them to shift their policies to ensure a less risky cohabitation. Unlike the Superpowers whose geographical distance, absence of territorial disputes and loads of good luck allowed them to scrape through the experience of Cuban missile crisis, China, India and Pakistan are too dangerously close to each other. Their hostilities run deeper. They might escape a crisis too with their share of good luck but there can be no guarantees. Therefore, there is a need to arrest the slide of doctrines, technologies and capabilities into areas that exacerbate nuclear risks.

The following paragraphs offer some suggestions that could be explored and kept ready for when the political climate appears right to pursue their implementation. These

[13] According to a report prepared by Michael Pillsbury for the US bipartisan China Economic and Security Review Commission that is based on writings of 20 Chinese military strategists, there are three books and several dozen articles going back a decade that advocate development of ASAT to covertly shoot down satellites to send a deterrent message. As cited by Muradian (2007).

include steps that may contribute towards nuclear risk reduction, promoting crisis stability, helping build confidence, and tension reduction.

Initiation of strategic dialogues (bilaterally or multilaterally) to better understand each other's threat perceptions and nuclear doctrines is one such step. Politically, an exchange of views, or even sharing of non-papers, at an appropriate level may be the easiest to start with since it would involve no commitment of any sort, and no agreements on capability constraints. This nevertheless could still be helpful in reducing misperceptions.

Related to this could be the institution of political and military hotlines, or their better utilisation where they do exist, for crisis management.[14] Such arrangements could be useful to address the problem of inadvertent escalation, particularly when one faces a strategy of brinksmanship or ambiguity that could spiral out of control. Hotlines between political leaders such as defence ministers and even prime ministers should also be considered.

Another possible measure could be formalising low alert levels, as the arsenals of China, India and Pakistan are already in such a state. Difficult though this step appears, it could be explored at track 2 level between experts. In case some understanding can be reached on how some acceptable mechanisms of verification for this can be created it could be a most meaningful step towards crisis stability, especially once new technologies such as hypersonics compress response timelines. In this matter, China's approach would be key since it has to factor in US developments too. In fact, there are apprehensions that it could be compelled to alter its own force posture towards greater readiness (Kulacki 2016; Yoshihara and Bianchi 2019). A Chinese official called upon the United States and the Russian Federation to remove their nuclear arsenals from high readiness as a way of reducing unnecessary risks (Cong 2019).

Another way to create a habit of engagement and dialogue may be to start with something less intrusive to national security such as sharing of best practices on nuclear safety and security related to civilian nuclear facilities. Given the expanding nuclear power programmes in the three countries, it may be useful to promote collaboration between their nuclear Centers of Excellence since each of the three states has one. Promotion of joint ventures on manufacture of radiation portals, radiation detection equipment, etc. could help foster a common security and safety culture for the region, which may be easier to expand to other issues.

Reiteration of the statement made by Presidents Reagan and Gorbachev renouncing nuclear war, by the three leaders in Southern Asia would also help to lower temperatures. This could be made unilaterally by any of the States, or by two of them, or all three or even

[14] Military hotlines exist between India and Pakistan but these have never been gainfully employed in crisis situations owing to the low trust levels. In a recent media report after the five-day visit of a high-ranking Army official to China, India's Army Chief General Manoj Mukund Naravane said that the proposal for a hotline between India's DGMO and China's chief of Western Theatre Command "has been accepted and procedural aspects have been ironed out" (Gurung 2020).

at the multilateral level. Of course, this would require China to give up its fundamental objection to engaging with India. Such a political statement could impact the salience attached to nuclear weapons and have a calming influence.

One possibly achievable step between India and China, once again, if the latter could get over its reservations about India's nuclear status, could be the formalisation of a bilateral no-first-use treaty. Currently, these two are the only advocates of such a doctrine. Its merit as a stabilising doctrine has been evident during the military stand-off between the two states who have not brandished their nuclear weapons. Mutual acceptance of a no-first-use policy would further have the potential to reassure the adversary, lessen possibilities of nuclear misperceptions and inadvertent escalation. In fact, the policy makes even more sense when one faces an adversary with a small nuclear arsenal that is likely to be extremely sensitive to its survival. Both India and China have, at different times, proposed a multilateral no-first-use treaty. Until this gains more global traction, it could be useful to turn at least their unilateral declarations into a bilateral statement.

In another possible initiative, the political leadership as well as the populace of the three countries could be sufficiently educated on the nature of nuclear weapons and the risks of deterrence breakdown. As it currently stands, the discussion about nuclear weapons in all three is framed around their profound role for national security. However, it is equally important to understand the limitations of these weapons. For instance, despite possessing nuclear weapons, India has had to withstand acts of terrorism from Pakistan and border incursions from China. Nuclear weapons are not the answer for every security threat. Other kinds of capability build-up and political engagement, therefore, become necessary complements of nuclear capability. It would be useful for instance, to promote individual or joint studies/movies on effects of deterrence breakdown. During the decades of the Cold War, regular drills, nuclear alarms and exercises kept the population aware of the possibility of nuclear war. This also led to a civil society movement that pressed for measures to reduce nuclear risks. Such a phenomenon has never been experienced in Southern Asia. In fact, there is very little understanding of dangers of nuclear use amongst the general public, as well as the leadership. A better understanding of these could lead to a readiness to invest in negotiations on resolving the trilemma, either through narrow risk reduction measures, or more broad-based efforts at conflict resolution by targeting the drivers of conflict.

Lastly, it may be suggested that the answer to nuclear complexities of the region may also lie in encouraging cooperation in non-nuclear areas. As has been mentioned earlier in the section on commonalities, the three countries in the region share common concerns and bear the common brunt of effects of climate change, health emergencies due to pandemics, or locust invasions in summer months, water stresses etc. There is room here for the three to explore some collective solutions. Till such time as a shared understanding of nuclear risks can be generated, habits of cooperation may be formed on other less security dominant issues. This may offer a spillover effect into the nuclear domain over time. The chance is certainly worth taking.

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