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Communicating Deterrence:

Drivers of Misperception in India & Pakistan

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Executive Summary

Since 1998, the possibility of nuclear conflict between India and Pakistan has remained an acute and persistent concern to the international community. Of particular consideration is the potential for nuclear escalation due to miscommunication and miscalculation. However, despite its importance, the role of language and communication in decision making is often overlooked. Numerous factors interplay to reduce their perceived importance. This includes the fact that deterrence remains a heavily theorised field, which can oversimplify options and outcomes; while an entrenched trust deficit often means official statements are met with scepticism.

To address the gap in the literature, this report seeks to understand how India's and Pakistan's nuclear deterrence is portrayed by their governments, and how it is understood by different actors in South Asia as well as the international community. It does so through a lens of language and communication and looks to find out where the potential for miscommunication arises. The language of deterrence is an important area of focus for several reasons. Firstly, intentions behind actions are often opaque. This means that governments have vital roles in clarifying the meaning behind potential signals such as missile tests or military exercises. What is more, the temptation to view activity through theoretical frameworks risks transposing Cold War assumptions and structures to South Asia. This ignores fundamental differences between the two contexts and invites assumed knowledge and solutions which are largely removed from the realities of South Asia. Secondly, language reflects the emotional and political complexities that underpin security dynamics and dilemmas. This is significant because India and Pakistan are increasingly competing in the 'sub-strategic' conflict space. By doing so, the potential for unintended escalation increases – as does the potential for miscalculation and unintended use.

The study presented here draws upon a range of methodologies, including literature reviews, semi-structured interviews, a roundtable discussion, and three surveys. The authors investigated how regional deterrence is understood by both specialist and non-specialist audiences, considering government, engaged audiences such as academic and policy communities, and general publics. By beginning their literature review with stated government positions and largely removing imposed secondary analysis, the authors sought an enhanced understanding of government intent, and insight into potential mitigating measures. Consequently, regarding doctrine this report identifies several areas that contribute to misunderstanding including:

- Both India and Pakistan draw on Cold War nuclear lexicon in their nuclear doctrines, although key concepts have evolved to reflect regional circumstances. As such, important nuances mean that neither doctrine can be fully explained solely through theoretical frameworks.

- Therefore, attention should be paid to both strategic cultures and the context in which key terms have evolved and are intended to be used. One such example is Credible Minimum Deterrence (CMD) which, despite underpinning both sets of national capabilities, remains poorly defined and open to various interpretations.

- Analysis here shows that CMD is primarily driven by the need for credibility and survivability, although numerous strategic programmes appear excessive to CMD's minimalist claims and heritage.

- Although the need for crisis-stability to prevent unintentional nuclear escalation has been long recognised, escalation pathways and thresholds remain unclear. Moreover, the

emotional and political intricacies of the region increase the complexities of de-escalation, which could be interpretated as 'loss of face'.

- As more advanced technologies such as missile defence or hypersonics are introduced into the region, articulating deterrence will become increasingly complex as well. This is exacerbated by the fact that, unlike other deterrence relationships, India and Pakistan have a shared border and differ significantly in their strategic depths.

- This will increasingly blur distinctions between strategic and tactical systems, and suggests a new nuclear lexicon will emerge to reflect the geographic setting, while also needing to accommodate India's desire to provide a credible deterrence against China.

Not all of these findings are new, and several elements are themes of ongoing debate. For example, in group discussions held as part of the project, participants agreed that certain doctrinal policies of both countries are misunderstood, contributing to instability. However, while representatives from both countries agreed there was misunderstanding, results differed on where that misunderstanding lay. Participants also agreed that the lack of correctly defined, agreed and understood lexicon could contribute to miscommunication in times of crisis, and that there is a need to take risk reduction measures to prevent future crises. Yet, at the same time, the focus on possible confidence building measures (CBMs) is contributing to a sense of 'CBM fatigue' within policy communities, adding further uncertainty to the potential implementation of future measures. However, there were certain points of divergence as well. For instance, on the ability to treat nuclear issues apart from other underlying security issues – such as the occupation of Kashmir, and the presence of terrorism. Such areas provide routes of potential escalation, particularly if political rhetoric heightens expectations to form a 'commitment trap'.

To help mitigate the risks of commitment traps and unintended escalation, this paper recommends increasing efforts to inform the general public on nuclear issues in India and Pakistan. Although English is the dominant language of both Indian and Pakistani security communities, it is only spoken by a minority in both countries. As a result, despite regular reporting of nuclear affairs, such news tends to be expressed in English, rather than local languages. Furthermore, reporting in local languages usually transposes terminology from the English, rather than being translated in a more meaningful manner. However, it is important to understand public attitudes accurately, with impacts including a slowing civil society engagement and lessening of government accountability. In conclusion: differing interpretations by respective communities affect meaning-making in Southern Asia. The way in which deterrence is communicated needs to be connected to the reality of the environment in which it is used.

Introduction

In May 1998, both India and Pakistan conducted a series of nuclear tests that irrevocably changed the South Asian security landscape. In the 20+ years since, both countries have increased the size and scope of their nuclear programmes, while also making substantive improvements in their delivery systems. However, understanding the impact of these changing capabilities is difficult. Estimates of the size of, and expenditure on, nuclear arsenals remain debated and, although both states have sought to clarify the intended use of their nuclear weapons, military secrecy means both sides are incentivised to mis-represent capabilities – both to each other, but also for internal reasons. Indeed, as Koithara notes, 'the problem of lack of information is compounded by the fact that there is a good deal of misinformation emanating from those who want to bolster the image of their institutions'.[1] Underpinning all of this is the well-documented 'trust deficit', which mean such statements are often viewed with considerable distrust. This applies to not only both Indian and Pakistani officials and scholars, but also to international officials and scholars who also observe and analyse these programmes.

This discrepancy is significant because continued miscommunication raises the risk of miscalculation between the nuclear-armed states – particularly in times of crisis. To better understand the phenomenon of miscommunication, and how the risks of miscommunication can be reduced, this report was premised on three identified areas of potential misunderstanding:

Firstly, the English-language lexicon of deterrence adopted by both countries has its roots in Cold War models, that are based around an axis of the United States and Soviet Union. Although key principles of deterrence may have carried over, the application of those principles have naturally been adapted to the local contexts. In turn, this has led to instances where terms used may deviate from their original Cold War centric meanings, or have taken on new meanings themselves. What is more, English is a minority language and only a fraction of the general public would use this type of language at all. As such, terms may lack clear definitions and may not be understood in the same manner by different parties. Indeed, Credible Minimum Deterrence (CMD) is an example of this.

Secondly, as neighbouring territories, the geographical setting of India and Pakistan is very different to that of the US and Soviet Union. On one hand, the shared India-Pakistan border could theoretically help reduce the technical demands of a national deterrent – for example by reducing the need to develop complex delivery systems. However, on the other hand, close proximity poses numerous deterrence challenges not faced by the superpowers, including reduced missile flight-times, and increased issues with systems discrimination and nuclear signalling.[2] As a result, many models and tools of deterrence are not directly comparable to the Cold War superpower experience, a fact compounded by differences in strategic depth, asymmetries in conventional military strength, the lack of advanced early warning systems, and India's desire to deter two nuclear-armed adversaries. The shared history of trauma which includes the violence of partition, the loss of East Pakistan (now Bangladesh), conflict over the governance of Jammu and Kashmir, and the growth of terrorism is also significant because iit introduces emotional intricacies to regional security which are often under-appreciated by external scholars.

Lastly, the relative nature of many terms adds further complexity to the language and semantics deployed. To overcome this, the

1 Verghese Koithara, Managing India's Nuclear Forces (Washington D.C.: Brookings Institution Press, 2012), 16.

2 Vipin Narang, 'Posturing for Peace? Pakistan's Nuclear Postures and South Asian Stability,' International Security, no. 3 (Winter 2009/10): 38-78.

authors anticipate that many terms will take on increasingly technical meanings that have often yet to be agreed. The expansion and increasing complexity of the region's nuclear lexicon will complicate expression, while differing interpretations by respective communities may give rise to the potential for discussion to lose cohesion and focus.

The project

This investigation, which took place in the winter of 2020 and spring of 2021, looks at how deterrence is viewed and expressed by various audiences. It is based on a classic literature review combined with interviews, surveys, and a roundtable workshop. Specifically, beginning at the official 'governmental level,' the authors sought to establish a baseline understanding of national postures by analysing the language of official statements such as declared nuclear doctrines; as well as statements by former officials which, though often given in personal capacities, are likely to be officially sanctioned. In particular, the authors sought to better understand CMD and the stated objectives of both countries. Drawing on this baseline understanding, the authors then explored how deterrence is viewed by Indian, Pakistani, and international scholars – noting differences in how key concepts have been articulated. This involved a combination of literature reviews, informal surveys, and roundtable discussion. These were used to gain more insight and add depth to the often generic and terse official language, and unpack the complexities and nuances of culture and emotion of shared trauma that shapes understanding of deterrence dynamics.

Finally, the authors sought to understand how regional deterrence is understood by non-specialist audiences domestically, through the impact of different lexicon and terminology, and the influence of domestic languages on these discussions.

For the surveys, the authors made use of the Prolific Academic data collection tool to recruit participants and disseminate questions amongst Indian and Pakistani non-specialists, including questions in local (non-English) language.

The surveys questioned the ways in which key deterrence terms are used, how they are applied in articulating doctrine, as well as interpretation of national statements. Within this, language and translation were considered: how these can challenge or reinforce specialised knowledge, and how information might be re-oriented to generate more productive discussions. This is important because, although discussion of nuclear affairs is primarily the domain of strategic analysts, the wider population serves as an audience for their analysis, as well as political rhetoric. Indeed, although largely removed from direct influence on government policy, wider public perceptions may still act to form latent pressure on domestic politicians through so-called 'commitment traps', while 'loose talk' by politicians may also be viewed by external audiences as examples of insincerity and hostility.

Consequently, this project also queried the meaning and use of nuclear CMBs, as well as the influence of public knowledge and awareness of nuclear deterrence. In doing this, the authors compared and contrasted responses by Indian and Pakistani experts as well as public outside the security community.

From the project and its roundtable, areas of agreement included:

- Importance of high-level political direction
- The perception that respective national nuclear programmes are misunderstood
- Prevailing trust deficit impacts narrow focus – temptation is to expand into other areas ie water
- CBM fatigue
- The need for risk reduction measures, including the need to have an effective communication channel particularly in the times of crisis.

Areas of disagreement included:

- Next steps and how to disentangle numerous inter-related security issues

The Importance of Language

At its most basic, language is a form of both expression and communication. It differs from the process of comprehension, wherein others seek to interpret, understand, and possibly act upon their understanding of those expressions. Neither process is neutral and the presence of structural biases can impact both expression and comprehension.[3] With their huge destructive potential, nuclear weapons symbolise authority and power, often evoking national pride, prestige, and bellicose language.[4] However, beyond their roles as symbols, governments must also embark on the more sober process of articulating the conditions under which they might use their weapons. Indeed, soon after the initial triumphalism of their May 1998 nuclear tests, both India and Pakistan sought to reassure global audiences and clarify the nature of their nascent weapons' programmes.

Traditionally, states articulate the intended use of nuclear weapons through the release of their nuclear doctrines. Nuclear doctrines can vary in format, but usually consist of 'a statement by an authoritative government source, in written or oral form, [that] present[s] a policy on the state's intent regarding the potential employment of nuclear weapons'.[5] These statements are not comprehensive documents, but instead represent high-level principles which states use to signal to adversaries the conditions of use, but also provide direction to military and scientific establishments on the size and composition of a future arsenals.

In choosing their approach, states may consider those of their competitors, but because states are also 'constrained by their geography, the size of their populations, economic resources including strategic raw materials and the industrial potential', they must take these factors into account as well.[6] Although doctrines are not binding, they nonetheless represent 'a public statement against which a state might be judged, both nationally and internationally'.[7] As such, doctrines carry considerable weight in international politics and play a key role in shaping understandings and expectations of national programmes for both internal and external audiences.

However, in the nuclear sphere, doctrines are not the only means of communication. States may periodically issue statements on their nuclear activities, while also undertaking a broad range of 'signalling' activities. Signalling to indicate hostility or national resolve may include such means as nuclear and missile tests, although signals may also include a range of other conventional activities such as military exercises, political statements, or various economic and diplomatic sanctions. In addition to any such signals, analysts may also look to a state's military capabilities to infer intent, for example, through analysis of a state's nuclear posture ie 'the capabilities, envisioned employment modes, and command-and-control procedures that go into operationalizing a nuclear weapon's capability'.[8]

Indeed, approaches such as Posture Optimisation Theory place an emphasis on 'what states can do, rather than what they say', and assume that states rationally seek to match their capabilities to intended uses, particularly in resource-constrained environments.[9] Nonetheless, because action is opaque, governments often seek to clarify their actions, and for nuclear matters

3 Moira Inghilleri, 'Mediating Zones of Uncertainty: Interpreter Agency, the Interpreting Habitus and Political Asylum Adjudication,' The Translator (2005).

4 Karsten Frey, Nuclear Weapons as Symbols, Institute Barcelona d'Estudis Internacionals (IBEI) (Barcelona, 2006).

5 Antoine Levesques, Desmond Bowen, and John H. Gill, Nuclear deterrence and stability in South Asia: perceptions and realities, International Institute of Strategic Studies (London, 2021), 9.

6 Naeem Salik, 'The Evolution of Pakistan's Nuclear Doctrine,' in Nuclear Learning in South Asia: The Next Decade (Monterey, C.A.: Center on Contemporary Conflict, 2014), 72.

7 Levesques, Bowen, and Gill, Nuclear deterrence and stability in South Asia: perceptions and realities, 9.

8 Vipin Narang, Nuclear Strategy in the Modern Era (Princeton, NJ: Princeton University Press, 2014), 3.

9 Narang, Nuclear Strategy in the Modern Era. 27.

states typically communicate through detached and deliberate language. Should individual ministers, officials, or other government representatives[10] mis-speak, care is taken to correct such statements and reiterate official positions. Thus, through their drafting and corrective processes, nuclear doctrines and other government statements represent heavily curated and controlled messages.

Beneath the Governmental level is a layer of specialists that seek to interpret, understand and explain government policy. In relation to India, Kampani dubs this a community of 'Strategic Analysts', which consists of individuals such as 'journalists, academics and the legions of retired foreign service and defense personnel who have adopted strategic analysis as a post-retirement profession'. According to Kampani, 'although the strategic analysts do not have any direct organisational or financial stakes in the missile or nuclear weapons programs, they share the ideological worldview of India's political and scientific elites'. A similar observation also applies to Pakistan, and in both countries the term applies 'to a broad category of analysts on foreign policy, defense, and strategic issues who occupy powerful positions in civil society institutions such as universities, think tanks and nonprofit and media organisations'.[11] This grouping does not necessarily have any direct influence on government policy, but seeks influence through their framing of issues and moulding public opinion. In doing so, Strategic Analysts may use a diverse range of theoretical frameworks or historical narratives and, in contrast to the dry and officious language of government, are able to draw upon the full range cultural and emotional complexities in their coverage and analysis.

Beneath the layer of Strategic Analysts are members of the public who are likely to consume output from the Strategic Analysts through channels such as broadcast, print or social media. However, public consumption is uneven with Almond distinguishing between the 'general public,' and the 'attentive public'.[12,13] The main difference between the two is that 'the general public tends to hold latent attitudes rather than well-entrenched viewpoints,' whereas the attentive public is 'a subset of the population interested in larger political issues'. Members of the attentive public 'tend to be educated and avid consumers of news, all of which correlates to a general awareness of current events and a higher level of political engagement'.[14]

For nuclear affairs, this distinction also has a linguistic element because although English is the dominant language of both Indian and Pakistani Strategic Analyst communities, it is still only spoken by a minority in both countries.[15] Moreover, because nuclear issues in both countries tend to be reported in English language outlets, rather than local languages such as Hindi or Urdu,[16] there is considerable bias in how nuclear affairs are reported and consumed with large portions of both countries largely excluded from quality discussions on

10 Definitions of Government representative may differ particularly where there is close cooperation with state owned enterprises (SOEs). For example, Kampani describes India's 'Strategic Enclave' made up of various industrial partners and decision makers. A similar formation is also present in Pakistan. However, because members of Strategic Enclave tend not to speak publicly on policy, any such statements have been included in the government tier. See Gaurav Kampani, 'Stakeholders in the Indian Strategic Missile Program,' Missile Program, no 3 (Fall-Winter 2003): 48-70.

11 Kampani, Stakeholders in the Indian Strategic Missile Program, 52.

12 Gabriel Almond, Opinion Publics. http://desart.us/courses/1010/publics.html. cited in Aditi Malhotra, Assessing Indian Nuclear Attitudes, Stimpson (Washington D.C., 2016).

13 Almond's third class of public – the policy and opinion elite – has considerable overlap with Kampani's class of Strategic Analysts.

14 Malhotra, Assessing Indian Nuclear Attitudes, 2.

15 For example, the 2011 Indian census recorded that English was only spoken by 10% (first language: 0.02%; second language: 6.64%; third language: 3.44%) of the population, with subsequent analysis by the Lok Foundation in 2019 showing further division by caste, education, gender, and region. 'In India, who speaks in English, and where?,' LiveMint, May 14, 2019.

16 Interview data.

nuclear affairs. Even where local language outlets do cover nuclear affairs, terminology is usually transposed from the English rather than translated directly into that language.[17] It almost goes without saying that borrowing and translation can impact communication.[18] What is more, miscommunication increases when researchers are not familiar with the native language of the person they are speaking with,[19] while the combination of effective captive audiences and limited domestic discussion can influence the growth of civil society approaches. Indeed, translation is a socially situated activity that can challenge, reinforce, or negotiate power relations, reflecting the identity of both oneself and others.[20]

Though public opinion is often overlooked, the attitudes of both the general and attentive audience are important to both political systems with indirect and longer-term impacts including a slowing civil society engagement and a lessening of government accountability. In addition, because latent attitudes are 'dormant attitudes that can be activated by appropriate stimulus'[21] politicians may seek to mobilise popular support through evoking a nuclear response to conventional security issues. Therefore, informed public perceptions may also aid risk reduction through providing tools to better challenge appeals of nuclear rhetoric and help prevent what Sagan calls a 'commitment trap'.[22] These are all essential elements to the deterrence debate in South Asia: how people say things, why they say them, and who they say them to.

17 For example, Prime Minister Modi often uses English loan words in his Hindi speeches when he wishes to emphasise in his political agenda. For instance, when addressing the Nuclear Security Summit Indian initiatives to the Indian public, he used the standard English loanwords or loan translations, such as 'framework'. Similarly, during the March 2021 Islamabad Security Dialogue, Prime Minister Khan used the English word 'security' in his Urdu opening speech.

18 Mildred L. Larson, Meaning-Based Translation: A Guide to Cross-Language Equivalence (New York: University Press of America, 1984).

19 Jaeyoung Choi, Kaysi Eastlick Kushner, and Judy Mill, 'Understanding the Language, the Culture, and the Experience: Translation in Cross-Cultural Research,' International Journal of Qualitative Methods, 11, no. 5 (2012): 652-665.

20 David Barton and Karin Tusting, Beyond Communities of Practice: Language Power and Social Context (Cambridge: Cambridge University Press, 2005).

21 John Gray Geer, Public Opinion and Polling Around the World: A Historical Encyclopedia (Santana Barbara: ABC-CLIO, 2004), 418. cited in Malhotra, Assessing Indian Nuclear Attitudes.

22 For discussion on commitment traps, see Scott D. Sagan, 'The Commitment Trap: Why the United States Should Not Use Nuclear Threats to Deter Biological and Chemical weapons Attacks,' International Security, 24, No. 4 (Spring, 2000): 85-115.

Methodologies

To examine how biases in language and communication may drive and perpetuate misperception, the authors used a range of analytical tools and methodologies, catered to the ways in which Governments, Strategic Analysts, and members of the public communicate. For example, to understand national positions, the authors conducted a literature review of government literature, purposefully minimising the role of secondary analysis. This approach is similar to adoption of empathy in strategic theorising, as suggested by the Nuclear Responsibilities Toolkit,[23] and supported by an overview of Indian and Pakistani nuclear and missile capabilities to understand how original visions are being interpreted and implemented domestically.

Literature reviews were also used to analyse the works of Strategic Analysts, as were a combination of semi-structured interviews and roundtable discussions. These allowed the authors to look beyond published policy and explore the political and emotional complexity of South Asian security. Digging deeper into this complexity, Bourdieu once described the concept of 'zones of uncertainty', ie spaces within a social structure in which contradictions emerge from a convergence of conflicting world views.[24] Depending on the context, 'zones of uncertainty' acknowledge that cultural knowledge can be used for specific purposes and no discourse is neutral.[25]

To account for this, the authors sought to draw upon the framework of 'pedagogic discourse': when specialised knowledge and power becomes taken for granted, one can make efforts to re-order and re-focus it to become a new set of understandings that works better for everyone involved.[26] Practical steps here include considering how exchanges are structured (the role of each party, how they participate in the discussion); looking at the knowledge that is exchanged (where it came from and how it was accumulated); providing a structure for the discourse (noting objectives and tasks, and how these will be initiated and followed-up on); and examining the roles of spoken, written as well as visual expressions (including the sources of meanings, and how they are brought into the exchange).[27]

Finally, to begin comparing the views of experts and the general public, two surveys were commissioned using the Prolific Academic survey tool. These surveys were designed to assess understanding of nuclear-related terminology outside of expert communities. Survey returns were requested in either Hindi or Urdu due to their prominence in India and Pakistan respectively, although the authors recognise that neither language represents either country. Returned answers were translated from their respective language into English for analysis. Indeed, translation features as a challenge in pedagogic discourse too. Consciously or unconsciously, the authority of the original party and language is preserved in translation which can lead to the 'inevitable inscription' of cultural values – both positively and negatively.[28]

Thinking about the situation and historical context of communication will lead to awareness of the different ways in which it can be understood. 'Border pedagogy' leverages this to consider how voices intermingle amidst

23 Sebastian Brixley-Williams, Alice Spilman, and Nicholas J. Wheeler, The Nuclear Responsibilites Toolkit, The British American Security Information Council (BASIC) and the Institute for Conflict, Cooperation and Security (ICCS) (London, 2021).

24 Pierre Bordieu, Pascalian Meditations (translated from French) (Stanford: Standford University Press, 2000).

25 Inghilleri, Mediating Zones of Uncertainty: Interpreter Agency, the Interpreting Habitus and Political Asylum Adjudication.

26 Basil Bernstein, The Structuring of Pedagogic Discourse: Class, Codes and Control, Vol. IV (London: Routledge, 1990).

27 David Rose, 'Analysing pedagogic discourse: an approach from genre and register,' Functional linguistics, 1, no 11 (2014): 1-32.

28 Lawrence Venuti, 'Translation and the Pedagogy of Literature,' College English, 58, No. 3 (1996): 327-344.

diverse power relations, and to determine cultural influence on communication strategies. Unsurprisingly, suggested solutions are comparable to mediation techniques: a willingness to challenge one's own beliefs, to engage in self-reflection, and to build trust and respect.[29]

It should be noted that this was only a small, short-term study in the context of the complex and long-standing discussion on deterrence in South Asia; but the authors hope it may contribute to the development of pedagogic discourse on this topic.

29 Jaime J. Romo and Claudia Chavez, 'Border Pedagogy: A Study of Preservice Teacher Transformation,' The Educational Forum (2006).

Section 1: Official positions

India

India's nuclear doctrine is formally outlined by the 4 January 2003 document 'The Cabinet Committee on Security Reviews Operationalization of India's Nuclear Doctrine'. This summarises India's official position, noting that the country seeks to build and maintain 'a credible minimum deterrent', while formally adopting a policy of 'No First Use'. Here, 'nuclear weapons will only be used in retaliation against a nuclear attack on Indian territory or on Indian forces anywhere' and that where use does occur, nuclear retaliation 'will be massive and designed to inflict unacceptable damage'.[30] The exception to this is 'a major attack against India, or Indian forces anywhere, by biological or chemical weapons [CBW]' where New Delhi 'retain[s] the option of retaliating with nuclear weapons'.[31] Along with the 2003 Summary, greater insight into Indian decision making can be gained through preceding documents and statements. For example, days after the five Pokhran-II nuclear tests (Codename: 'Operation Shakti', 11–13 May 1998), on 27 May Prime Minister Vajpayee addressed the Indian Parliament. During this address, Vajpayee articulated what would become the foundations of India's nuclear doctrine, namely that India's nuclear weapons were defensive, that the country did not seek to enter an arms race, and that the country would observe a voluntary moratorium on nuclear testing.[32]

The principles of self-defence and restraint were also carried over into the 1999 India's Draft Nuclear Doctrine (DND), written by the National Security Advisory Board (NSAB). Unlike the 2003 Summary, the DND was only advisory although the NSAB did publish it in full. Here, the DND noted India's desire to pursue Credible Minimum Deterrence (CMD), but also that 'In this policy of 'retaliation only', the survivability of our arsenal is critical'. Rather than place limits on the size or composition of its nuclear forces, CMD is seen as 'a dynamic concept related to the strategic environment, technological imperatives, and the needs of national security'. Therefore, the 'actual size components, deployment and employment of nuclear forces will be decided in the light of these factors'. This emphasis on survivability means that India seeks to develop nuclear forces that are 'effective, enduring, diverse, flexible, and responsive to... the concept of credible minimum deterrence'.[33] To fulfil this, New Delhi seeks to develop a nuclear triad of land-, sea-, and air-based systems, such that 'Survivability of the forces will be enhanced by a combination of multiple redundant systems, mobility, dispersion and deception'.[34] From its inception then, Indian decision makers have sought a maximalist interpretation of its CMD, emphasising not the numbers of weapons, but the survivability of its forces. Rather than CMD, analysts such as Rajesh Rajagopalan instead characterise it as 'Assured Retaliation'.[35]

Other significant factors influencing this approach include a desire to retain the country's strategic autonomy, 'independent of international positive security assurances, vis-à-vis extended

30 The Cabinet Committee on Security Reviews Operationalization of India's Nuclear Doctrine, (January 4 2003). https://www.mea.gov.in/press-releases.htm?dtl/20131/The+Cabinet+Committee+on+Security+Reviews+ perationalization+of+Indias+Nuclear+Doctrine.

31 The Cabinet Committee on Security Reviews Operationalization of India's Nuclear Doctrine.

32 Rahul Roy-Chaudhury, 'India's Nuclear Doctrine: A Critical Analysis,' Strategic Analysis (2009).

33 Draft Report of National Security Advisory Board on Indian Nuclear Doctrine, NSAB (Online, 1999).

34 Although the DND and 2003 Summary are broadly consistent, several potentially significant changes were also introduced, including a change from 'punitive retaliation' to 'massive retaliation'. The meaning of this change is unclear, although in the Indian context, it is generally understood to be a counter-value strategy, wherein India would retaliate to a nuclear attack by targeting an adversary's cities and other significant population centres with nuclear weapons. For a greater discussion on the significance of the difference, see Adil Sultan, 'India's Nuclear Doctrine: A Case of Strategic Dissonance or Deliberate Ambiguity,' IPRI Journal (2018). Also Rishi Paul, Foregrounding India's Nuclear Responsibilites, British American Security Information Council (London, 2018).

35 Rajesh Rajagopalan, 'Assured Retaliation: The Logic of India's Nuclear Strategy,' in The Long Shadow: Nuclear Weapons and Security in 21st Century Asia (Stanford, CA.: Stanford University Press, 2008).

third-party deterrence guarantees';[36] and India's experience with the Nuclear Non-Proliferation Treaty (NPT). Opened for signature in 1968, the NPT only recognises states that had built and tested a nuclear explosive device by 1 January 1967 as Nuclear Weapon States (NWS). However, India's first nuclear test (Pokhran I) came after this, on 18 May 1974, and the country is not a legally recognised NWS. Although India is often recognised as a reluctant nuclear power because after 1974 the country did little to weaponise its nuclear capabilities,[37] one impact of the exclusion from the NPT has been the embedding within India's strategic communities and culture a desire to retain the flexibility of a nuclear triad and not limit future freedom of action.[38] The corollary of this experience has been on India's pursuit of strategic technologies such as Ballistic Missile Defence (BMD) which may not necessarily be integrated into the country's nuclear strategy, and/or the apparent development of a 'technology reserve',[39] ie where technologies such as Anti-Satellite (ASAT) capabilities are developed but not necessarily employed. In addition to allowing for national and scientific prestige, such an approach prevents future discrimination against India in any international arms control and non-proliferation agreements.[40]

That said, India has a history of incrementally progressing and qualitatively improving its programmes, which in turn permit step changes in national programmes.[41] As such, initial motivations may not be useful guides to understanding future uses.

Areas of challenge

Despite repeated public commitments, the credibility and longevity of India's doctrine of credible minimum deterrence and commitment to NFU are under strain from both internal and external pressures. Perhaps the most serious challenge to India's NFU pledge is the credibility gap of India's commitment to Massive Retaliation which envisions the destruction of Pakistani cities in response to the potentially limited use of a Pakistani nuclear weapon against a military target.[42] To increase the credibility of its posture, analysts such as Clary and Narang assert that India is developing a suite of capabilities that could support a shift away from NFU and options of 'hard nuclear counterforce targeting' that could provide New Delhi with 'a limited ability to disarm Pakistan of strategic nuclear weapons'.[43] This is evidenced by various public statements by politicians, the qualitative improvements of India's missile forces and nuclear-capable aircraft, and the acquisition and development of strategic technologies that are far in excess of minimum deterrence.

Indeed, Clary and Narang are not alone in believing India's strategic procurements go beyond the requirements of minimum deterrence with Kristensen noting that India's increasing 'combination of multiple warheads, increased accuracy, and drastically reduced launch time would indicate that India is gradually designing its way of out its so-called minimum deterrence doctrine towards a more capable nuclear posture'.[44] It is also notable that India's commitment to NFU is already treated with

36 Paul, Foregrounding India's Nuclear Responsibilites, 10.

37 George Perkovich, India's Nuclear Bomb: The Impact on Global Proliferation (Berkeley: University of California Press Books, 2002).

38 Interview data.

39 For discussion of technology reserves in the Chinese context, see Jonathan Ray, Red China's 'Capitalist Bomb': Inside the Chinese Neutron Bomb Program, National Defense University Press (Washington, D.C., 2015).

40 Interview data.

41 For example, see Perkovich, India's Nuclear Bomb: The Impact on Global Proliferation.

42 Notably, the Indian concept of Massive Retaliation and the destruction of an unspecified number of major Pakistani cities is qualitatively different from early US approaches to Massive Retaliation. These were outlined by US Secretary of Defense Robert McNamara in his written statement to Congress on 18 February 1965, which stated that: 'what kinds and amounts of destruction we would be able to inflict in order to provide this capability cannot be answered precisely. But it seems reasonable to assume that destruction of, say, one quarter to one third of its population and about two-thirds of its industrial capacity'. Cited in Paul, Foregrounding India's Nuclear Responsibilites, 24.

43 Christopher Clary and Vipin Narang, 'Christopher Clary, Vipin Narang; India's Counterforce Temptations: Strategic Dilemmas, Doctrine, and Capabilities,' International Security (2019): 7.

44 Hans Kristensen, India's Missile Modernization Beyond Minimum Deterrence, Federation of American Scientists (October 4, 2013). (October 4, 2013). https://fas.org/blogs/security/2013/10/indianmirv/.

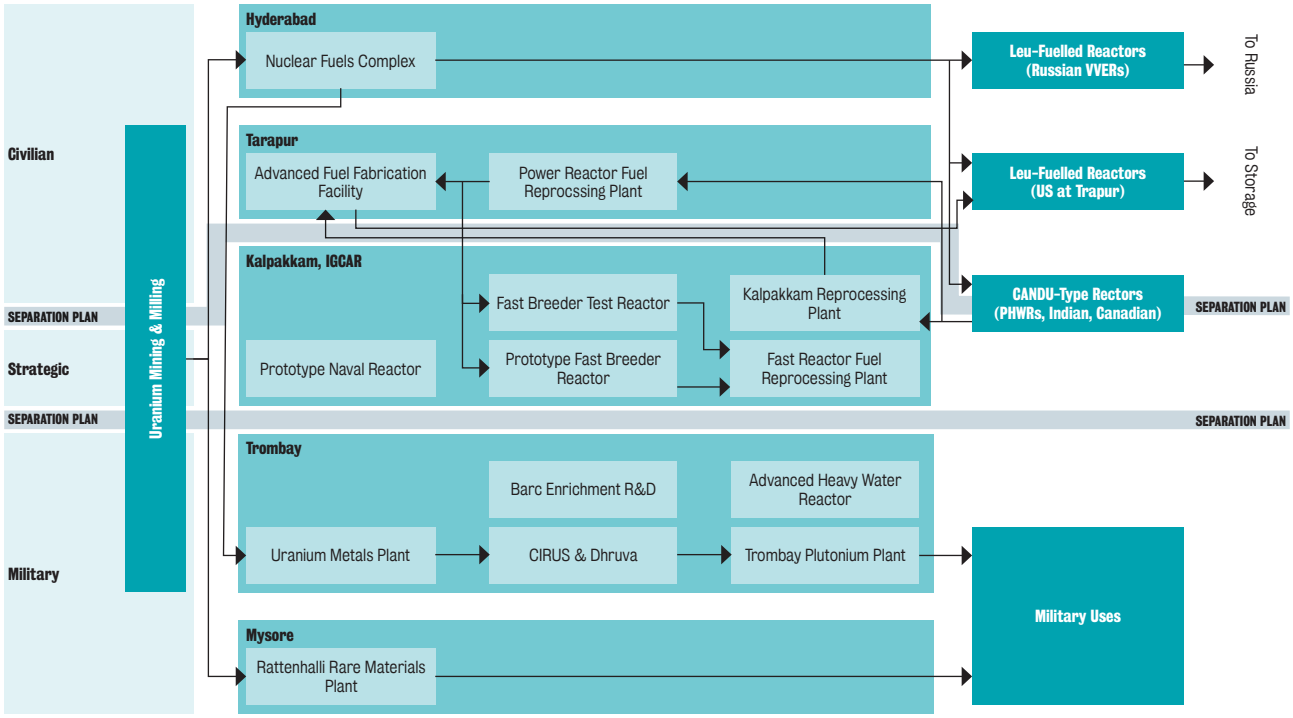
considerable scepticism by some in Pakistan, who point to the extra-territorial nature of attacks on India forces 'anywhere' in the world, India's first use exemption to CBW attack,[45] and development of short-ranged missiles, which they deem to be used in a nuclear role.[46]

Critics of the capability-based approaches criticise the selective use of unofficial quotes and instead point to the repeated public stance on India's NFU posture, the the differing rationales for procuring strategic technologies (for example bureaucratic and institutional politics) as well as a desire for current and future prestige.[47] Moreover, they note that even with individual capabilities, India's nuclear command and control (NC2) system is yet to integrate all such technologies into a unified system.[48]

In addition to developing weapons systems in excess of stated intent, there are long-standing concerns that India's nuclear fuel cycle can also support a weapons programme that exceed minimum deterrence requirements.

India's three stage fuel cycle has historically integrated its civilian and military programmes although following the 2005 123 Agreement with the US, New Delhi committed to separate its integrated fuel-cycle along military and civilian lines.[49] As a result, India has sought to better differentiate between its safeguarded civilian programme, and those used for purely military purposes. However, complicating this is India's middle 'strategic' tier, made up of infrastructure that has historically been used for both military and civilian programmes and that is still to be separated. The compromise to this so far has been the partial implementation of safeguards at certain cites to only when declared civilian material is present.[50]

India's nuclear fuel cycle and Separation Plan



Credit: Based on Dr. Frederick Mackie, Lawrence Livermore National Laboratory, and Congressional Research Service, published in Sharon Squassoni, 2006. 'India's Nuclear Separation Plan: Issues and Views', CRS Report for Congress, Order Code RL33292, Updated July 21, 2006Original: See P 22 - https://www.everycrsreport.com/files/20060721_RL33292_fbd617e7707ce5d2cadafced7b1f7c983f360b30.pdf

45 Interview data

46 Ashfaq Ahmed, Muhammad Rameez Mohsin, and Ishaq Ahmad, 'Indian Tactical-Short Range Missiles, Fragile Nuclear Doctrine and Doctrinal Crisis Triggers Crisis and Strategic Instability in South Asia,' Pakistan Social Science Review (2019).

47 Rajesh Rajagopalan, India and Counterforce: A Question of Evidence, Observer Research Foundation. (New Delhi, 2020).

48 Rajagopalan, India and Counterforce: A Question of Evidence.

49 'Implementation of the India-United States Joint Statement of July 18, 2005: India's Separation Plan.'

50 India's Nuclear Separation Plan: Issues and Views, Congressional Research Service (Washington D.C., 2006).

Two such 'strategic' sites are the 100 tHM/yr BARC's Power Reactor Fuel Reprocessing Plant (PREFRE) located in Tarapur, and a second adjacent site (PREFRE 2) that was opened by Prime Minister Manmohan Singh in January 2011.[51,52] PREFRE 2 also has a declared capacity of 100 MT per year, and both will contribute to the civilian FBT programme. Although full implementation of the 123 Agreement has stalled on account of disagreement of nuclear liability, India has still made some efforts to prepare for the separation of its fuel cycle. For example, at the same time that PREFRE 2 was under development at Tarapur, BARC also constructed an 'identical facility' at BARC Trombay – the home of India's military nuclear programme.[53]

This reprocessing plant at BARC Trombay is in addition to the pre-existing 1960s reprocessing plant which has an estimated 50 tHM/yr capacity.[54]

Even if the second reprocessing facility at BARC Trombay is to replace, rather than supplement the original facility and provide a dedicated military channel to fulfil the civil-military separation requirements it still represents an increase in military reprocessing capacity. Odd for a country that, since the 2010 closing of the CIRUS reactor,[55] has a reduced military plutonium production capacity.

Moreover, in addition to reprocessing capacity, India is looking to expand its enrichment capabilities with the Special Material Enrichment Facility (SMEF) that is planned to be part of the 'Science City' project in Challakere in Chitradurga District, Karnataka. In November 2011, Srikumar Banerjee, then chairman of India's Atomic Energy Commission (AEC), confirmed that India was planning an enrichment capability at the Science City but did not confirm a particular role saying instead that 'we are keeping the option open of using it for multiple roles'.[56]

BARC Trombay 19.025087° 72.930593°
Image date: 12/8/2012
Image Credit: 2021 Google Earth/Maxar Technologies

BARC Tarapur: 19.835207° 72.667105°
Image date: 1/30/2019
Image Credit: 2021 Google Earth / Maxar Technologies

India has increased its reprocessing capacity. Facilities such as the reprocessing facility at Tarapur have been publicly acknowledged, but a near identical facility at BARC Trombay has received far less public attention. Although the facility at Trombay adds to India's reprocessing capacity, one interpretation is that it would contribute towards a separated nuclear fuel cycle.

51 Global Fissile Material Report 2015: Nuclear Weapon and Fissile Material Stockpiles and Production, International Panel on Fissile Materials (Princeton, 2015).

52 'PM dedicates Tarapur reprocessing plant to nation,' The Times of India, January 7, 2011.

53 Charlie Cartwright, Facility analysis: Bhabha Atomic Research Centre, Janes Satellite Imagery Analysis (London, 2019).

54 Global Fissile Material Report 2015: Nuclear Weapon and Fissile Material Stockpiles and Production.

55 India shuts down CIRUS reactor," IPFM BLOG, International Panel on Fissile Materials, last modified December 31, 2010, https://fissilematerials.org/blog/2010/12/india_shuts_down_cirus_re.html

56 Some details of India's nuclear program," IPFM BLOG, International Panel on Fissile Materials, last modified November 26, 2011, https://fissilematerials.org/blog/2011/11/some_details_of_indias_nu.html

Even if the SMEF was to be purely civilian in nature, it is likely that India will seek a safeguards exception. This is possible because, in addition to BARC, the science city will also host facilities operated by the Defence Research and Development Organisation (DRDO), the Indian Institute of Science (IISc), and the Indian Space Research Organization (ISRO) and – as outlined by INFCIRC/731 – in India a 'facility will [also] be excluded from the civilian list if it is located in a larger hub of strategic significance, notwithstanding the fact that it may not be normally engaged in activities of strategic significance'.[57]

India's nuclear triad

After several abortive attempts in the 1970s to reverse engineer and develop missile engines,[58] in 1983 India launched the Integrated Guided Missile Development Programme (IGMDP) to rationalise and revitalise its missile development programmes. Since launching the IGMDP, India has developed various suites of missiles including delivery vehicles for all three legs of the nuclear triad. These are still in various stages of deployment but by 2021, deployed Indian capabilities can target all of Pakistan, and can target increasingly far into China. Regarding its nuclear delivery capabilities, apparent emphasis has been placed on developing nuclear-powered ballistic-missile submarines (SSBNs) and increasing the range of its missiles to reach intercontinental distances.

Considerable effort has also been paid to developing the quality of its missile force, notably that of its Agni programme. In addition to its missile force, India is pursuing other strategic assets including anti-satellite (ASAT) weapons,[59] Ballistic Missile Defence (BMD),[60] warheads with a Multiple Independent Re-entry Vehicle (MIRV) capability,[61] and hypersonics.[62]

Land leg

Work on the Prithvi ('Earth') missile family began in 1983 under the IGMDP.[63] Prithvi I has an estimated range of 150km, while the improved Prithvi II has an estimated range of 250km.[64] The Dhanush ('Bow') is a Ship-based Ship-Launched Ballistic Missile (ShLBM) naval variant of the Prithvi II with an estimated range of 400km.[65] Of these, only Prithvi II and Dhanush are estimated to be nuclear armed.[66] Indeed, Prithvi I is slated to be replaced by the 150km ranged non-nuclear Prahar ('Strike') missile, while a 200km ranged Pranash ('Lord of Life') variant is also under development,[67] possibly to replace the Prithvi II at a later date. Similar to Prahar, Pranash is also not expected to be nuclear armed.[68]

If India does replace its Prithvi I and II missiles with non-nuclear alternatives, this will leave the land leg of India's nuclear triad reliant on the longer-range Agni ('Fire') missile programme. Since testing the two-stage Agni test demonstrator in 1989, India has deployed the short-ranged Agni I and the medium-ranged Agni II, although by 2021 the longest ranged

57 'Communication dated 25 July 2008 received from the Permanent Mission of India concerning a document entitled 'Implementation of the India-United States Joint Statement of July 18, 2005: India's Separation Plan,' in INFCIRC/731 (Vienna: IAEA, July 25 2005).

58 For Project Devil and Project Valiant see Rajesh Rajagopalan and Atul Mishra, Nuclear South Asia: Keywords and Concepts (London: Routledge, 2015).

59 Ashley J. Tellis, India's ASAT Test: An Incomplete Success, Carnegie Endowment for International Peace (Washington, DC, 2019).

60 Snehesh Alex Philip, 'India's ballistic missile shield ready, IAF & DRDO to seek govt nod to protect Delhi,' The Print, January 8, 2020.

61 Ch Sushil Rao, 'After Agni V test, director Tessy on to next challenge,' The Times of India, April 22, 2012.

62 'India can have complete hypersonic cruise missile system in 4-5 years: DRDO,' The Economic Times, October 14, 2020.

63 Z. Mian, A.H. Nayyar, and M.V. Ramana, 'Bringing Prithvi Down to Earth: The Capabilites and Potential Effectiveness of India's Prithvi Missile,' science and Global Security 7 (1998).

64 Ballistic and Cruise Missile Threat, Defense Intelligence Ballistic Missile Analysis Committee (Wright-Patterson AFB, Ohio, 2020).

65 Prithvi," Federation of American Scientists, last modified November 5, 2002, https://nuke.fas.org/guide/india/missile/prithvi.htm

66 Kristensen and Korda, Indian Nuclear Forces.

67 Rahul Singh, 'India to develop 200-km range tactical ballistic missile,' The Hindustan Times, February 7, 2020.

68 India to develop 200-km range ballistic missile.

Agni deployed was the rail-mobile Agni III Intermediate-Range Ballistic Missile (IRBM). Agni IIIs have only been deployed in limited number, with NASIC estimating that fewer than 10 launchers deployed.[69]

Work on the various Agni programmes continues and India is also expected to deploy the cannisterised Agni P ('Prime') alongside current short- and medium-range missiles.[70] In addition to being cannisterised, Agni P will also feature a limited ability to manoeuvre in-flight.[71] Work also continues on the Agni IV and V Intercontinental Ballistic Missiles (ICBMs) including cannisterisation of the Agni V.[72] Interest in an Agni VI was also reported in 2013[73] although few definitive statements about the Agni VI programme have been made since.

Naval Leg

Although the Dhanush ShLBM represents a ship-based capability, the missile appears to be a test-bed capability and only two launchers are estimated to have been deployed.[74] Instead, India's naval-leg will initially rely on the 700km ranged K-15, and the 3,400km ranged K-4 Submarine Launched Ballistic Missiles (SLBMs). By 2021, only 12 x K-15 have been deployed on India's sole Arihant-class SSBN, INS Arihant. However, up to four of the 7,000 tonne Arihant class may be produced, with a new 13,500 tonne class SSBN – currently only identified by its project name as the S-5[75] – is also planned for the 2020s.[76] The S-5 is expected to be equipped with up to 12 new 6,000km ranged K-6 missiles, reported to be a three-staged SLBM with a MIRV capability. According to Sandeep Unnithan in India Today, 'the K-6 will ensure that the future Indian SSBN's bastion area will be within the Bay of Bengal, from where it can target all its potential adversaries'.[77]

Air

India's initial nuclear capability was composed of nuclear gravity bombs, capable of being delivered by Mirage 2000H Vajra ('Divine Thunder') or Jaguar IS/IB Shamsher ('Sword of Justice') aircraft. Both platforms are ageing and it is likely that India has sought 'a modern fighter-bomber that will probably take over the air-based nuclear strike role in the future'.[78] Several options exist including the French-made Dassault Rafale or the Russian-made Sukhoi Su-30MKI. Neither aircraft has a confirmed nuclear role, although according to former Indian envoy Rakesh Sood, the Rafale was chosen over the Eurofighter Typhoon 'because the French were accepting of the idea that the Rafale would become a part of the air segment of India's nuclear triad'.[79] The decision to equip India's Su-30s with BrahMos cruise missiles has also led to speculation that these could also be used in a nuclear role.[80] BrahMos I and II cruise missiles have been co-developed with Russia. Despite speculation of a future nuclear capability, the Indian government has repeatedly denied that either BrahMos missile will have a nuclear role[81] and in 2017 NASIC ascribed conventional roles to both BrahMos-I and II.[82]

In addition to the BrahMos, India has also indigenously developed the Nirbhay cruise

69 Defense Intelligence Ballistic Missile Analysis Committee, 'Ballistic and Cruise Missile Threat'.
70 Snehesh Alex Philip, 'Agni Prime is the new missile in India's nuclear arsenal. This is why it's special,' The Print, June 30, 2021.
71 Philip, Agni Prime is the new missile in India's nuclear arsenal.
72 Kristensen and Korda, Indian Nuclear Forces.
73 Ajai Shukla, 'Advanced Agni-6 missile with multiple warheads likely by 2017,' Business Standard, May 8, 2013.
74 Defense Intelligence Ballistic Missile Analysis Committee, "Ballistic and Cruise Missile Threat.
75 According to this notation, INS Arihant is described as S-2, INS Aridhaman is S-3. Saurav Jha, 'India's Undersea Deterrent,' The Diplomat, March 30, 2016. The other two ships in class are currently unnamed, although have been described as S-4, and S-4* respectively.
76 Sandeep Unnithan, 'A peek into India's top secret and costliest defence project, nuclear submarines,' India Today, December 18, 2017., H.I. Sutton, 'Tweet May Have Inadvertently Revealed India's Next-Gen Nuclear Weapons Platform With Global Reach,' Forbes, September 8, 2019.
77 Unnithan, A peek into India's top secret and costliest defence project, nuclear submarines.
78 Kristensen and Korda, Indian Nuclear Forces. 219.
79 Jyoti Malhotra, 'India favoured Rafale also because of its 'nuclear advantage',' The Print, February 15, 2019.
80 Ankit Panda, 'The Sukhoi-30 MKI: India's Two-Front War Ace?,' The Diplomat, January 10, 2014.
81 Franz-Stefan Gady, 'India Stands Up New Su-30MKI Squadron,' The Diplomat, January 20, 2020.
82 Ballistic and Cruise Missile Threat, Defense Intelligence Ballistic Missile Analysis Committee (Wright-Patterson AFB, Ohio, 2017).

missile which is often described as nuclear-capable by Indian sources.[83] With its sub-sonic speeds, Nirbhay is slower than the supersonic BrahMos I, and hypersonic BrahMos II. Nonetheless, India is also pursuing its own hypersonic technology, testing the Hypersonic Technology Demonstrator Vehicle (HSTDV) in September 2020.[84] India's HTNP Industries are also developing the HGV-202F hypersonic glide vehicle.[85]

MIRVs

India's forthcoming land-based Agni V[86] ICBM and K-6 SLBM[87] are expected to be MIRV'd.

Ballistic Missile Defence

On 8 January 2020, India's The Print newspaper cited a 'top government official' who claimed that testing for India's indigenous Ballistic Missile Defence (BMD) programme was now complete, and that 'All tests carried so far have been successful, including the radars and missiles'. According to the unnamed official, the programme was awaiting a political decision on its employment with the Indian Air Force and DRDO preparing 'a joint proposal for the government's clearance'. If confirmed, India will operate a two-tiered BMD system to protect New Delhi (and possibly other cities too). Upper tier defence will initially be based around the Prithvi Air Defense (PAD)/Pradyumna interceptor, before its replacement with the Prithvi Defense Vehicle (PDV) interceptor. The PDV will provide exo-atmospheric defence and operate at an altitude of between 50–180km. Lower-tier defence will be based around the single-stage solid-fuelled Advanced Air Defense (AAD)/Ashin hit-to-kill interceptor, that will be operational at endo-atmospheric altitudes of 15-40km.[88] India's BMD capability will sit alongside the Russian S-400 advance air defence system, which is also credited with a limited BMD capability.[89]

Anti-Satellite Missiles

On 27 March 2019, India tested an anti-satellite weapon, striking a test satellite at an altitude of almost 300km Low Earth Orbit (LEO).[90] Code named 'Mission Shakti' ('Power'),[91] the test used a modified PDV interceptor making India the fourth country to demonstrate an ASAT kinetic kill capability, after the US, Russia and China. The purpose of the test is unclear although interviews with Indian SMEs suggests the test was less about developing an operational capability, but rather prestige with India effectively developing a technical reserve so that New Delhi may have 'a seat at the table' in any future arms control negotiations. Nonetheless, India also appears to be exploring other counterspace capabilities, including Directed Energy Weapons (DEWs), and co-orbital killers in addition to protective measures for its own satellites.[92]

83 'Nuclear capable subsonic cruise missile 'Nirbhay' successfully test-fired from ITR,' United News of India, June 24, 2021.

84 'India test-fires hypersonic technology demonstrator vehicle; joins select group,' The Economic Times, September 8, 2020., Kelsey Davenport, 'India Tests Hypersonic Missile,' Arms Control Association, October, 2020.

85 'The first test of HGV-202F,' in Medium.com (Online: Medium.com, September 21 2020).

86 Hemant Kumar Rout, 'India to conduct first user trial of Agni-V missile,' The New Indian Express, September 13, 2021.

87 Unnithan, A peek into India's top secret and costliest defence project, nuclear submarines.

88 Franz-Stefan Gady, 'Report: India's Homemade Anti-Ballistic Missile Shield Ready,' The Diplomat, January 8, 2020.

89 'S-400 Triumf', Missile Threat, CSIS Missile Defense Project, last modified July 6 2021, https://missilethreat.csis.org/defsys/s-400-triumf/

90 Rajat Pandit and Chethan Kumar, 'India shoots into star wars club,' The Times of India, March 28, 2019.

91 Similar in name to 'Operation Shakti' and the five nuclear tests conducted in 1998.

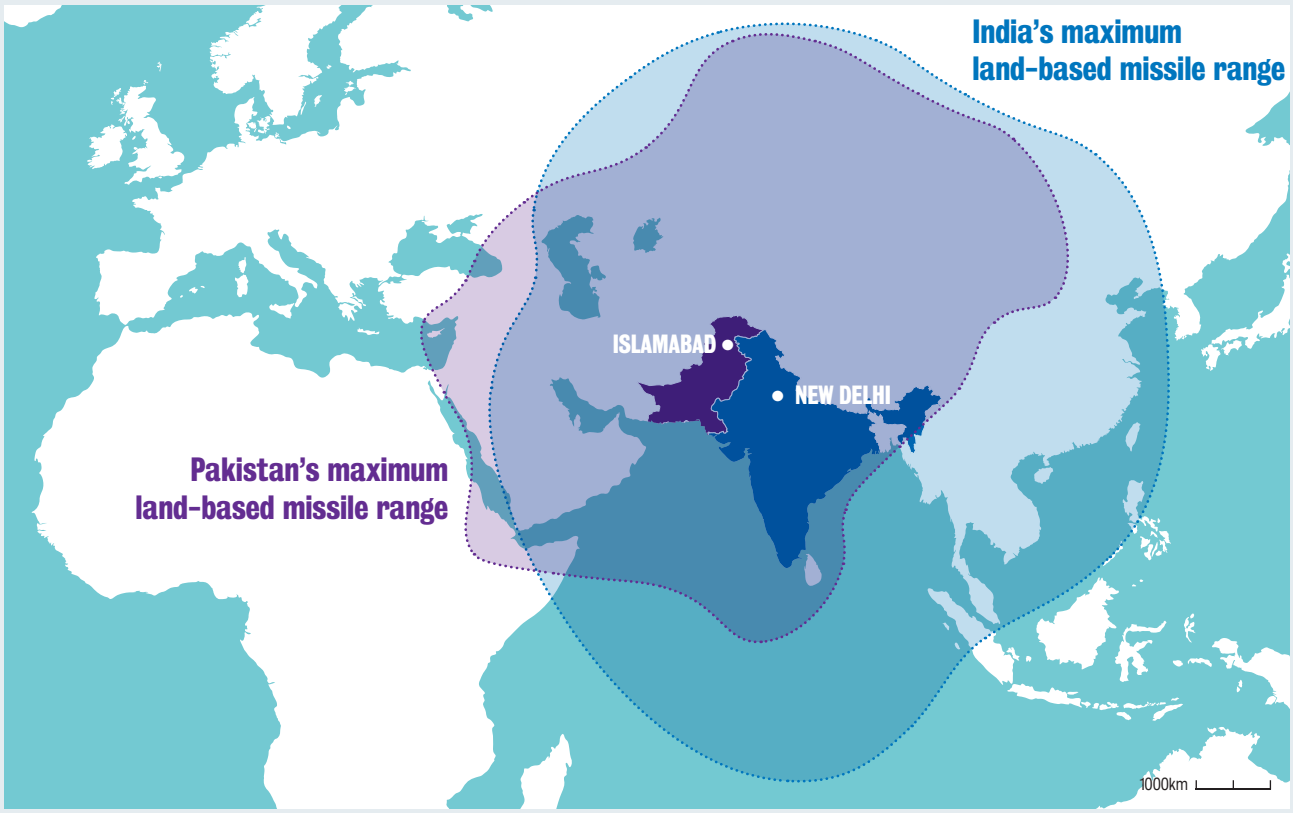
92 Rajat Pandit, 'Satellite-killer not a one-off, India working on star wars armoury,' The Times of India, April 7, 2019.

Indian missiles

Type	Name	Category	National Designation	Number of launchers	Year deployed	Estimated range	Warheads x yields	Warhead numbers
Aircraft	Vajra		Mirage 2000H	32	1985	1,850	1 x bomb	32
	Shamsher		Jaguar IS	16	1981	1,600	1 x bomb	16
Land-based ballistic missiles	Prithvi-II	CRBM	N/A	30	2003	350	1 x 12	30
	Agni-I	SRBM	N/A	20	2007	700+	1 x 40	20
	Agni-II	MRBM	N/A	12	2011	2,000+	1 x 40	12
	Agni-III	IRBM	N/A	8	2014?	3,200+	1 x 40	8
	Agni-IV	IRBM	N/A	N/A	-2020	3,500+	1 x 40	N/A
	Agni-V	IRBM	N/A	N/A	-2025	5,200+	1 x 40	N/A
Sea-based ballistic missiles	Dhanush	ShLBM	N/A	2	2013	400	1 x 12	4
	K-15 (Sagarika)	SLBM	N/A	1/12	(2018)	700	1 x 12	12
	K-4	SLBM	N/A	N/A	?	3,500	1 x ?	0

Based on Hans M. Kristensen & Matt Korda. 2020. 'Nuclear Notebook: Indian nuclear forces, 2020' in Bulletin of the Atomic Scientists, July 1, 2020

Estimated missile footprints for India and Pakistan



Pakistan

Pakistan's nuclear doctrine has not been formally released to the public, although, since 2017, the country has used the formulation 'Full Spectrum Deterrence, in line with the policy of Credible Minimum Deterrence and avoidance of arms race' to describe its nuclear doctrine.[93] Although 'Full Spectrum Deterrence' is reminiscent of US Secretary of Defense, Robert McNamara's desire to ensure that a credible nuclear response was available at all levels of nuclear escalation, Pakistan's usage of the term here is qualitatively different. Indeed, as noted by Sultan, 'the term was coined to elaborate the complete spectrum of threats that Pakistan would like to address, starting from a limited to an all-out war'.[94]

Nonetheless, Pakistan's doctrine remains technical in nature and is perhaps best understood in terms of the country's evolving security concerns. For example, by the time of its 1998 nuclear tests, Pakistan only had a scratch nuclear capability with delivery limited to a small wing of F-16 fighters.[95] The size and scope of its arsenal effectively limited any targeting to cities and a de facto policy of minimum deterrence. In terms of intended use, it appears that rather than directly using its weapons, Islamabad initially sought to adopt a 'catalytic posture' wherein the threat of nuclear use would bring in international intervention. However, within a year, Pakistani policy makers added the term 'credible' to the mix, creating the term 'minimum credible deterrence'.[96]

Indeed, soon after its nuclear tests, the credibility of Pakistan's new nuclear doctrine would be tested. On 13 December 2001, the Indian Parliament was attacked by five terrorists from Lashkar-e-Taiba and Jaish-e-Mohammed. This came after the May-June 1999 Kargil Conflict, which saw the two countries engage in a limited conflict along the line of control (LOC) in Kashmir. With relations already low, after the attack on the Indian Parliament, India blamed Pakistani authorities for supporting the terrorists and mobilised its military under Operation Parakram. However, Indian mobilisation was slow and it took Indian strike corps at least three weeks to get to the border. Pakistan used the time to counter-mobilise, resulting in a near six month military stand-off between December 2001–June 2002. To prevent a repeat of Operation Parakram's slow mobilisation, and 'correct the perceived deficiencies in India's conventional war-fighting doctrine,' in April 2004 the Indian chief of army staff unveiled the new 'Pro-Active' concept.[97] Also known as Cold Start, this new doctrine envisioned India's strike corps being reformulated to more agile Integrated Battle Groups. These were scheduled for September 2021 and 'will be self-contained fighting formations with the elements of every arm and service mixed together as per the terrain and operational requirements'.[98] One impact of this will be the ability to threaten limited punitive strikes on Pakistani territory.

In response to Cold Start, and India's conventional military advantage, in 2011 Pakistan tested the Nasr (Hatf IX) short range surface-to-surface multi-tube ballistic missile.[99] Nasr seeks to prevent a conventional Indian attack against Pakistan by lowering the threshold of nuclear conflict and limiting Indian options in the sub-strategic space. The explicit linkage with Nasr to Cold Start was described by Chief of the Army Staff Gen Qamar Bajwa, who was reported by Pakistani media as saying that Nasr

93 Baqir Sajjad Syed, 'Pakistan to retain full spectrum deterrence policy,' Dawn, December 22, 2017.

94 Sultan, India's Nuclear Doctrine: A Case of Strategic Dissonance or Deliberate Ambiguity, 43.

95 Feroz Khan, Eating Grass: The Making of the Pakistani Bomb (Stanford, CA: Stanford University Press, 2012).

96 Sadia Tasleem, Pakistan's Nuclear Use Doctrine, Carnegie Endowment for International Peace (Washington, D.C., 2016).

97 Walter C. Ladwig III, 'A Cold Start for Hot Wars? The Indian Army's New Limited War Doctrine,' International Security. 32, No. 3 (Winter, 2007/2008), pp. 158-190.

98 'Offensive defence: Army to ready its first set of new battle groups by September end,' The New Indian Express, August 9, 2021.

99 Shakil Shaikh, 'Pakistan test-fires Hatf-IX,' The News, April 20, 2011.

seeks to 'pour cold water on Cold Start'.[100] At the same time as creating a 'tactical' response, Pakistan also began to publicly differentiate between 'operational' and 'strategic' levels. For example, on 5 and 11 March 2012, Pakistan test fired the short-range Abdali (Hatf II). According to Pakistan's Inter-Services Public Relations (ISPR), Abdali provides 'an operational level capability, additional to the strategic level capability'.[101] According to Fitzpatrick the difference between the two levels is that deterrence at the operational level 'refers to a sizable military offensive including mechanised/armoured divisions, strike corps and corps-plus size forces'. In contrast, deterrence at the strategic level means 'preventing an all-out war involving two or more strike corps'.[102]

However, introducing new nuclear graduations was not Pakistan's only response to Cold Start. Between 2009 and 2013, Pakistan undertook a series of military exercises codenamed Azm-e-Nau ('New Resolve') with the 2010 Azm-e-Nau III exercise being largest military exercise undertaken by Pakistan since Pakistan's 1998 Zarb-e-Momin exercises.[103] The Azm-e-Nau series was considered a success with the ISPR reporting that after a 'culmination of four years of war gaming and exercises, the Pakistan military has now adopted a 'new concept of war fighting' aimed at pre-empting India's 'Cold Start Doctrine''.[104]

Perhaps less well recognised than Pakistan's new nuclear gradations, Pakistan's 'new concept of war fighting' also represents a strand of considerable continuity in Pakistan's military and nuclear planning. Although Pakistan has not publicly released its nuclear doctrine, various authoritative Pakistani officials have commented on the country's doctrine in sufficient detail for its broad contours to be well understood. For example, in addition to Pakistan's nuclear deterrence being India-centric,[105] in 2008 Lavoy suggested that Pakistan's strategic deterrence strategy consists of five major elements. These begin with a conventional approach, namely that Pakistan seeks:

- 'An effective conventional fighting force and the demonstrated resolve to employ it against a wide range of conventional and sub-conventional threats;
- a minimum nuclear deterrence doctrine and force posture;
- an adequate stockpile of nuclear weapons and delivery systems to provide for an assured second strike;
- a survivable strategic force capable of withstanding sabotage, conventional military attacks, and at least one enemy nuclear strike; and
- a robust strategic command and control apparatus designed to ensure tight negative use control during peacetime and prompt operational readiness (positive control) at times of crisis and war'.[106]

Pakistan's nuclear doctrine should be viewed as an evolution of these elements, and conventional forces still form the backbone of Pakistan's two-tiered approach to national deterrence.[107] Indeed, Pakistani military planners are confident that should Indian forces attack, Pakistani forces will have the home advantage of defence, in addition to international pressure to deescalate. This perhaps explains General Kidwai's 2015 remarks that '[t]here is a healthy balance between the conventional forces on either side,' and that Pakistan's nuclear forces are 'very

100 Bajwa, cited in Baqir Sajjad Syed, 'Nasr pours cold water on India's cold start doctrine: Bajwa,' Dawn, July 6, 2017.

101 ISPR Release No.PR34/2012-ISPR, (March 5 2012). https://ispr.gov.pk/front/main.asp?o=t-press_release &id=1979. cited in Phillip Schell and Hans Kristensen, 'Pakistani Nuclear Forces,' in SIPRI Yearbook 2013 (Stockholm: SIPRI, 2013).

102 Mark Fitzpatrick, Overcoming Pakistan's Nuclear Dangers (London: IISS | Routledge, 2014), 33.

103 Sannia Abdullah, 'Cold Start in Strategic Calculus,' Islamabad Policy Research Institute (IPRI) Journal, 12, no. 1 (Winter 2012): 1-27.

104 'Pakistan Army to preempt India's 'Cold Start Doctrine',' The Express Tribune, June 16, 2013.

105 Salik, The Evolution of Pakistan's Nuclear Doctrine.

106 Peter R. Lavoy, 'Islamabad's Nuclear Posture: Its Premises and Implementation,' Worries Beyond War (Carlisle, PA: Strategic Studies Institute, 2008).

107 Meenakshi Sood, 'Pakistan's (Non-Nuclear) Plan to Counter 'Cold Start',' The Diplomat, March 25, 2017.

much integrated as a backup force in some kind of situations, which we would like to call the larger nuclear strategy'.[108] Such assessments are corroborated by the former SPD's Brigadier (retired) Dr Naeem Salik who notes 'Pakistan has enough confidence in its conventional military strength and would therefore not be compelled to decide on an 'early use' of nuclear weapons'. Nor does Pakistan envision a protracted conventional conflict with there being confidence in its conventional forces to hold out in time for international intervention to come to bear. As Salik warns, 'in case the current conventional military balance is disturbed and further tilted in India's favour Pakistan's reliance on its nuclear capability would increase and its nuclear threshold would be lowered which would be a dangerous development'.[109]

Therefore, in contrast to narrow interpretations of Pakistani doctrine which emphasise pre-emption,[110] at present, Pakistani military planners expect a greater time cushion than is more commonly appreciated. For this reason, and the expectation of international involvement, Pakistan still retains catalytic elements to its nuclear posture.[111] Indeed, as noted by the former SPD's Lt Gen Khalid Kidwai (Retired) in February 2020 'It is the Full Spectrum Deterrence capability of Pakistan that brings the international community rushing into South Asia to prevent a wider conflagration'.[112] However, in light of evolving Pakistani-US bilateral relations, and the fact that the US may no longer be considered a neutral broker in any future India-Pakistan crisis, Pakistan is prepared to asymmetrically escalate and use nuclear weapons in the case of non-intervention.

Indeed, Pakistan's SFC is able to mate its warheads to delivery systems 'within a few hours'.[113]

Areas of challenge

Pakistan's nuclear doctrine is technical in nature, and it appears Pakistani policy makers had difficulty in initially articulating the country's response to Cold Start. For example, the Nasr was first tested in 2011, before being seemingly inducted into service in 2014.[114] Around this time, the ISPR used various formulations including the omission of 'minimum' from 'credible minimum deterrence' in 2010; and replacement of credible minimum deterrence with 'full spectrum deterrence' in 2013.[115] Since 2014, official statements have used credible minimum deterrence in conjunction with full spectrum deterrence, eventually settling on its current iteration – 'Full Spectrum Deterrence, in line with the policy of Credible Minimum Deterrence and avoidance of arms race' – in 2017.[116]

In addition, Pakistan's differentiation of tactical, operational, and strategic tiers is often seen in terms of counter-force or counter-value targeting. Here, the 'first use' of a nuclear weapon by Pakistan is often presented as a counter-force capability, therefore putting India into a 'use it or lose it' dilemma. In turn, this is destabilising because it incentivises nuclear-pre-emption. However, as Sultan points out, 'first use' differs from 'first strike' and 'as per the established nuclear lexicon, 'First Use' could be intended to warn the adversary about the consequences of the failure to retreat from aggressive posturing, and is generally limited in scope... 'First-strike',

108 General Khalid Kidwai, A Conversation with Gen. Khalid Kidwai, ed. Peter Lavoy (Carnegie International Nuclear Policy Conference, March 23 2015).

109 Salik, The Evolution of Pakistan's Nuclear Doctrine, 75.

110 For example, see Sébastien Miraglia, 'Deadly or Impotent? Nuclear Command and Control in Pakistan,' Journal of Strategic Studies, 36, no. 6 (2013): 841-866.

111 Toby Dalton, 'Signaling and Catalysis in Future Nuclear Crises in South Asia: Two Questions after the Balakot Episode,' in South Asia: Post Crisis Brief (Washington: Nuclear Crisis Group, 2019).

112 Khalid Kidwai, 'Pakistan's Policy of 'Quid Pro Quo Plus': Remarks by Lt Gen Khalid Kidwai (Retd) at the IISS London,' in Strafasia (February 7 2020). https://strafasia.com/gen-kidwai-speech-iiss-ciss-workshop-london-6-february-2020/.

113 Interview data.

114 Asad Haroon, 'Pakistan test-fires Hatf-IX,' Dispatch News Desk, September 26, 2014.

115 ISPR Release No. PR180/2013-ISPR cited in Tasleem, Pakistan's Nuclear Use Doctrine.

116 Syed, Pakistan to retain full spectrum deterrence policy.

on the other hand, aims to destroy adversary's capacity to retaliate by launching a pre-emptive nuclear strike'.[117] Given that Pakistan is still to demonstrate the technical requirements for a counter-force capability,[118] any first use would rather be used against conventional forces and therefore should be considered 'counter-military' rather than a disarming 'first strike'. In this sense, large parts of Pakistan's nuclear doctrine remain misunderstood because although the country's doctrine does include elements of asymmetric escalation, any potential 'first use' of nuclear weapons would be against military, rather India's nuclear targets, and only after the near exhaustion of its conventional forces.

Although elements of credible minimum deterrence have been long-embedded within Pakistan's nuclear doctrine, so too have its contradictions, namely the need to establish credibility against more minimalist principles. Credibility underpins several strands of Pakistani posture including the need to credibly deter a larger neighbour with a larger conventional military; and the need to credibility escalate to catalyse foreign intervention. The demands of stockpiling and survivability will continue to stress stated commitments to minimalism and the prevention or arms-racing, particularly as Pakistan seeks to adapt to new and evolving threat perceptions vis-à-vis India, including New Delhi's interest in BMD, ASAT, increasing access to fissile material via the US-India 123 Agreement, and more recently India-US intelligence sharing.

In addition to an increasing the quality and quantity of its missile force, Pakistan has also sought to expand its fissile production material, seemingly in excess of requirements. For example, Pakistan now operates four military plutonium production reactors at Khushab[119] and is expanding enrichment capacity at Khan Research Laboratories.[120] And even though there are numerous reasons why external estimates of fissile production may be too high including 'fuzzy maths',[121] or the over-reliance on estimates and operating assumptions,[122] the investment in such large and expensive infrastructure seems at odds with an expected plateauing in arsenal sizes.

Pakistan's nuclear triad

Despite international cooperation on rocket technology beginning in the 1960s, concerted Pakistani efforts to begin a military missile programme began in the late 1980s, following General Mirza Aslam Beg's 1987 appointment as Vice Chief of the Army staff.[123] From its initial technology base of French sounding-rocket technology, Pakistan has benefited from co-operation with Chinese and North Korean suppliers and is now capable of producing a wide-range of indigenised missile types.

The majority of Pakistan's missile focus has been on ensuring the survivability of its land leg, although efforts to develop and enhance the air and sea legs of its triad.

To date, no interest in additional strategic technologies such as missile defence or hypersonics has been announced, although Islamabad has sought to counter New Delhi's newly acquired BMD with a combination of MIRV'd ballistic missiles and cruise missiles.[124]

117 Sultan, India's Nuclear Doctrine: A Case of Strategic Dissonance or Deliberate Ambiguity, 39.

118 Described by Koithara as 'A counterforce strike will call for impeccable intelligence, exceptional force capability and faultless executions of plans. The strike must be able to cover every counterforce target in one go, and the attacking forces must have the accuracy and penetrativity to destroy what will be the best protected targets on the other side'. Cited in Koithara, Managing India's Nuclear Forces, 78.

119 Sarah Burkhard, Allison Lach, and Frank Pabian, Khushab Update, Institute for Science and International Security (Washington D.C. , 2017).

120 Charlie Cartwright, Karl Dewey, and Ian Stewart, 'Spin strategy: likely uranium facility identified in Pakistan,' Jane's Intelligence Review, November, 2016.; David Albright, Sarah Burkhard, and Frank Pabian, Pakistan's Growing Uranium Enrichment Program, Institute for Science and International Security (Washington D.C., 2018).

121 Elizabeth Whitfield, 'Fuzzy Math on Indian Nuclear Weapons,' Bulletin of the Atomic Scientists (2016).

122 Naeem Salik, Pakistan's Nuclear Force Structure in 2025, Carnegie Endownment for International Peace (Washington D.C., 2016).

123 Khan, Eating Grass: The Making of the Pakistani Bomb, 236.

124 'Pakistan has cost-effective solution to India's latest ballistic missile defence system: Report,' The Economic Times, November 7, 2018.

Land leg

Work on the Haft series of missiles began in the late-1980s, with the early Haft-I and Haft-II (Abdali) close range, solid-fuelled missiles. The precise lineage of these missiles is unclear, although the French Dauphin and Eridan sounding rockets may have formed the technology bases for the Haft-I and Haft-II, respectively.[125] Produced by SUPARCO both the Haft-I and Haft-II are aging and will soon come to the end of their service lives.

In addition to potential French influence, Pakistan has indigenised Chinese missile technology. For example, the Haft-III (Ghaznavi) is derived from the short-ranged Chinese M-11 / DF-11 (CSSS-7). Similar to the M-11 transfer, China transferred M-9 medium-range ballistic missile (MRBM) technology to Pakistan, which now forms the basis of the Shaheen I (Haft-IV) MRBM. Pakistan appears to have further improved this technology with the Shaheen II (Haft-VI) MRBM, although analysts such as Norbert Brügge suggest that the Shaheen II may also be derived from the Chinese M-18 missile.[126] In 2015 Pakistan tested the 2,750km ranged Shaheen III missile,[127] which is capable of hitting all Indian territory although by 2020, it had not yet been deployed.[128]

Other Pakistani MRBMs include the 1,250km ranged Ghauri (Haft 5) missile. Based on the North Korean No-dong, the Ghauri entered service in 2003.[129] KRL also developed the 2,200km ranged Ababeel MRBM, which was tested in 2017,[130] but by 2020 was not yet in service.[131]

The Ababeel is reported as being MIRV capable, with explicit reference to meeting the challenges of 'ensuring survivability of Pakistan's ballistic missiles in the growing regional Ballistic Missile Defence (BMD) environment'.[132]

Air leg

Pakistan's initial deterrence capability was envisioned as nuclear gravity bombs, delivered by its small number of F-16 fighters. However, the political cost of using US-made fighters and the relatively low survivability this was likely soon superseded by Pakistani ground-based missiles. However, interest in maintaining the air-leg has remained and Pakistan has since developed at least two families of cruise missiles. All air launched nuclear capable missiles have been tested on Mirage aircraft, although Pakistan has other platforms that could also deliver this payload.[133]

Ra'ad (Hatf-VIII) is a nuclear capable air-launched cruise missile (ALCM) with an estimated 350km range.[134] In addition to Ra'ad, Pakistan has developed the Babur (Hatf-VII) cruise missile family. Babur I has a range of 350km, with an improved 450km ranged Babur IA tested in February 2021.[135]

Sea Leg

Babur III is a navalised version of the Barbur designed for use on Pakistan's Agosta 90B diesel-electric submarines. It has the potential to form part of a naval deterrence leg, once development is complete.[136]

125 Khan, Eating Grass: The Making of the Pakistani Bomb.

126 Norbert Brügge, The striking similarity of some Chinese and Pakistani solid fuel missiles, (July 24 2020). http://www.b14643.de/Spacerockets/Specials/Pakistan-China/index.htm.

127 Mateen Haider, 'Test launch of Shaheen-III ballistic missile successful: ISPR,' Dawn, March 9, 2019.

128 Defense Intelligence Ballistic Missile Analysis Committee, 'Ballistic and Cruise Missile Threat.'

129 Hans M. Kristensen and Robert S. Norris, 'Pakistani nuclear forces, 2015,' Bulletin of the Atomic Scientists (2015).

130 'Pakistan conducts first flight test of Ababeel surface-to-surface missile,' Dawn, January 24, 2017.

131 Defense Intelligence Ballistic Missile Analysis Committee, 'Ballistic and Cruise Missile Threat'.

132 Dawn, 2017.

133 Interview data.

134 Defense Intelligence Ballistic Missile Analysis Committee, 'Ballistic and Cruise Missile Threat'.

135 Naveed Siddiqui, 'Pakistan Army conducts successful test launch of surface-to-surface Babur cruise missile,' Dawn, February 11, 2021.

136 Ankit Panda and Vipin Narang, 'Pakistan Tests New Sub-Launched Nuclear-Capable Cruise Missile. What Now?,' The Diplomat, January 10, 2017.

Pakistani missiles

Type	Name	Category	National Designation	Number of launchers	Year deployed	Estimated range	Warheads x yields	Warhead numbers
Land-based ballistic missiles	Abdali	CRBM	(Hatf-2)	10	2015	200	1 x 5-12 kt	10
	Ghaznavi	SRBM	(Hatf-3)	~16	2004	300	1 x 5-12 kt	~16
	Shaheen-1	SRBM	(Hatf-4)	~16	2003	750	1 x 5-12 kt	~16
	Shaheen-1A	SRBM	(Hatf-4)	–	2022	900	1 x 5-12 kt	–
	Shaheen-2	MRBM	(Hatf-6)	~16	2014	1,500	1 x 10-40 kt	~16
	Shaheen-3	MRBM	(Hatf-6)	–	2022	2,750	1 x 10-40 kt	–
	Ghauri	MRBM	(Hatf-5)	~24	2003	1,250	1 x 10-40 kt	~24
	NASR	CRBM	(Hatf-9)	~24	2013	60-70	1 x 12 kt	~24
	Ababeel	MRBM	(Hatf-?)	–	–	2,200	MIRV/MRV?	
Ground and air-launched cruise missiles	Babur	GLCM	(Hatf-7)	~12	2014	350	1 x 5-12 kt	~12
	Babur-2/1(B)	GLCM	(Hatf-?)	–	–	700	1 x 5-12 kt	–
	Ra'ad	ALCM	(Hatf-8)	–	–	350	1 x 5-12 kt	–
	Ra'ad-2	ALCM	(Hatf-?)	–	(2022)	>350	1 x 5-12 kt	–
Sea-based cruise missiles	Babur-3	SLCM	(Hatf-?)	–	–	450	1 x 5-12 kt	–

Based on Hans M. Kristensen & Matt Korda. 2021. 'Nuclear Notebook: How many nuclear weapons does Pakistan have in 2021?' in Bulletin of the Atomic Scientists September 7

Unpicking Credible Minimum Deterrence

Both India and Pakistan's nuclear doctrines are rooted in Credible Minimum Deterrence (CMD); with India maintaining an official adherence to CMD since 2003, and Pakistan expressing its doctrine, after several reformulations, since 2017 as one of 'Full Spectrum Deterrence, in line with the policy of Credible Minimum Deterrence and avoidance of arms race'.[137] However, despite this shared use, the term CMD is unique to the subcontinent and, as noted by Salik, the term 'has not been properly defined and is not fully understood by either side'.[138]

CMD has its roots in the philosophy of 'Minimum Deterrence', which is generally characterised by No-First Use (NFU), and small arsenals that are based upon survivable platforms. In turn, these are capable of delivering a second, retaliatory, strike against targets such as cities.[139] The guiding principle here is that it is possible to inflict 'unacceptable damage' upon an adversary and punish them through relatively limited means. As such, states may forego the need for large or expansive nuclear arsenals. Minimalist postures therefore may have numerous advantages over more expansive approaches including lower costs, simplified nuclear command and control (NC2), the avoidance of arms racing and reduction in military tensions.[140]

Despite these potential benefits, such postures may lack credibility – particularly where adversaries possess strong conventional military capabilities, or non-nuclear weapons of mass destruction ie chemical or biological weapons (CBWs). More recently, other technological challenges to small arsenals may include where states are developing or acquiring increasingly capable Intelligence, Surveillance, and Reconnaissance (ISR) systems that could support nuclear or non-nuclear counter-force operations, or increasingly capable defensive systems that threaten the assuredness of a small nuclear strike.

To address the apparent weaknesses of a minimalist posture, India and Pakistan have both sought to emphasise the credibility of their nuclear deterrents, adding the credible modifier to their minimal postures. However, as Jones notes 'the term credible is a much more demanding criterion than 'minimum' deterrence might imply by itself'.[141] Indeed, the emphasis on credibility of response amplifies the contradictions inherent to minimum deterrence – namely that increasing the survivability of one's forces often necessitates either increasing numbers of nuclear weapons, and/or the diversity of platforms and delivery systems as well. Furthermore, increasing the flexibility of use increases the demands placed on command and control systems. These do little to constrain costs, while also furthering perceptions of arms-racing, thus the more that a country emphasises the credibility of its nuclear capabilities the fewer benefits of minimum deterrence it receives. Indeed, these contradictions are evident in both Indian and Pakistani nuclear programmes and help partially explain the apparent dissonance between statements and policy.

In addition to the desire to ensure the credibility of their arsenals, both Indian and Pakistani approaches to CMD have further commonalities, but also differences. By reviewing government statements, statements by former officials and elements of military capabilities, this paper identifies areas of commonality and difference in interpretation of CMD across five areas,

137 Syed, Pakistan to retain full spectrum deterrence policy.

138 Interview data.

139 H B Hollins, Averill L. Powers, and Mark Sommer, The Conquest of War: Alternative Strategies fo Global Security (Boulder, CO: Westview Press, 1989). Cited in Koithara, Managing India's Nuclear Forces, 74.

140 Koithara, Managing India's Nuclear Forces, 74.

141 Rodney W Jones, Minimum Nuclear Deterrence Postures in South Asia: An Overview, Defense Threat Reduction Agency: Advanced Systems and Concepts Office (Washington D.C. , 2001), 3.

namely an emphasis on survivability of forces; low (but relative) arsenal sizes; low alert status; no 'first strike' disarming strategies; and role of nuclear signalling. However, the application of these broad principles differs by national implementation. Both countries also differ in other important ways including though their nuclear fuel cycles, nuclear organisations, targeting plans, and types of deterrence they seek to invoke.

Survivability

Both India and Pakistan have sought to develop legs of the nuclear triad to increase the survivability of their nuclear forces. Although India's pursuit of a sea-borne leg of its deterrent via the Arihant-class SSBN, Pakistan has sought a similar effect through the dispersal of land forces, with an emphasis on hardened shelters, supported by mobility, deception, camouflage.[142]

Low, but relative, numbers

Both Indian and Pakistani decision makers associate larger arsenal sizes with increased survivability, and refuse to commit themselves to a number. As such, external analysts must rely on open source estimates – the most authoritative being the Nuclear Notebook series produced by the Federation of American Scientists (FAS) – published in the SIPRI yearbooks. According to the FAS, both Indian and Pakistan have increasing arsenals.[143] Even if arsenal size and compositions are informed by the adolescent nature of their respective programmes, how they will grow as both programmes mature remain uncertain. However, both arsenal sizes are unlikely to grow indefinitely and narratives that India and Pakistan have the fastest growing arsenals are met with clear frustration by some Strategic Analysts.[144]

In addition to the relative nature of 'low numbers', Indian and Pakistani decision makers also appear to define CMD in opposition to the excesses of the Cold War. Here, India and Pakistan's modest arsenals stand in contrast to the thousands of weapons built by the US and USSR, with analysts in both countries arguing that deterrence can be achieved far more cheaply with smaller arsenals.[145] Writing in 1998, K Subrahmanyam, described the lessons learnt from the Cold War noting that 'India has the benefit of the wisdom drawn from the highly risky and totally non-viable policies of nuclear deployment followed by the United States and the USSR. It has, therefore, no intention of repeating those blunders'.[146]

Low alert status

As well as low numbers of weapons, relative to the needs of regional deterrence and the superpower experience, Indian and Pakistani Strategic Analysts also hold their low alert statuses as evidence of a minimalist posture. Both countries generally keep their nuclear warheads in disassembled form and away from delivery vehicles (although one notable form may by cannisterised missiles – intended to be used in India's SSBN, and possibly future Agni deployments).[147] This, and the non-use of a 'hair-trigger alert' seen in the Cold War are also seen as sources of minimalism by both sides.

Targeting

Neither India nor Pakistan have articulated a 'first strike' policy, wherein the nuclear weapons of opposing countries would be targeted in a disarming first strike. Instead, Indian policy is assumed to retain a focus on targeting Pakistani cities; while Pakistan has articulated three tiers of targeting (tactical, operational, and strategic) in combination with conventional armed forces.

142 Koithara, Managing India's Nuclear Forces.

143 Hans M. Kristensen and Matt Korda, 'Indian Nuclear Forces,' Bulletin of the Atomic Scientists (2020); Hans M. Kristensen, Robert S. Norris, and Julia Diamond, 'Pakistani Nuclear Forces,' Bulletin of the Atomic Scientists (2018).

144 Salik, Pakistan's Nuclear Force Structure in 2025.

145 Interview data.

146 K. Subrahmanyam, 'Talbott is Stuck in Pre-'85 Nuclear Groove,' The Times of India, November 17, 1998.

147 Pakistan is also developing navalised cruise missiles, first testing its Babur-3 indigenous submarine launched cruise missile in January 2017. However, rather than a cannisterised vertical launch system (VLS), Babur-3 is reported to eject horizontally through a submarine's torpedo launcher because '[w]ith vertical launch systems it is impossible to keep weapons in dissembled form but with horizontal launch system Pakistan has made this option possible for itself'. Ahyousha Khan, 'Babur Missile Test: Pakistan validating its Second-Strike Capability,' Modern Diplomacy, April 27, 2018.

Should Pakistan fail to deter a Cold Start style conventional attack, its conventional forces be overwhelmed, and international intervention not be forthcoming, Pakistan is prepared to use nuclear weapons against Indian military targets.[148] At present, it lacks the real-time capabilities to target India's mobile nuclear forces theoretically freeing India from the 'use it or lose it' dilemma.

Signalling

Both countries have experienced 'loose talk' from politicians on the desirability of nuclear war. Often considered as a form of signalling, officialdom in both countries actively seeks to clarify and downplay such comments.[149] In this sense, both states seek to curate their messaging and ensure that nuclear signalling pathways remain clear. However, the pathways and forms in which nuclear signalling would occur remain uncertain. As noted by Narang, India and Pakistan both lack advanced early-warning systems; their shared border drastically reduces flight and warning times; while their delivery vehicles are assigned both nuclear and non-nuclear roles, which make it impossible to discriminate between nuclear and conventional missions in real time.[150] Such factors even limit the role of assets such as nuclear-capable aircraft, which are often seen as playing a virtuous role within a nuclear triad for the their signalling potential.

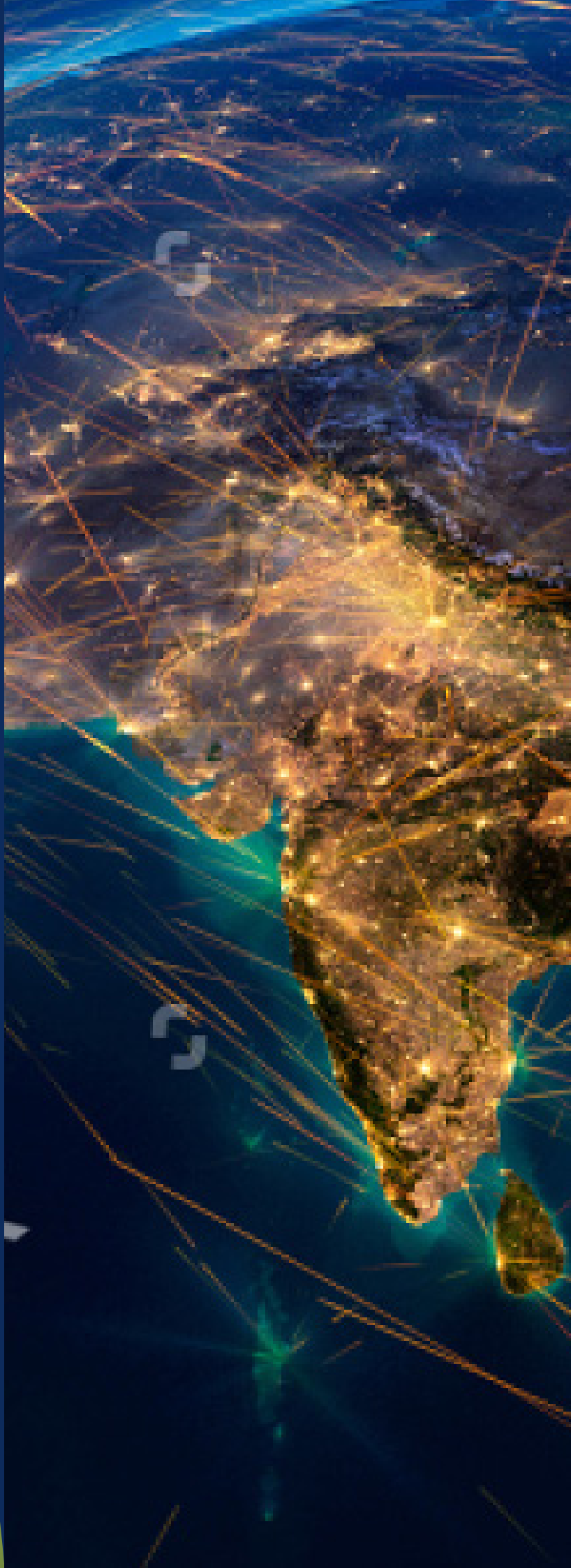
As a result, most signalling is likely to be declaratory, which can be problematic. An example of this uncertainty can be seen in the 2019 Balakot/Pulwama crisis wherein authorities made several references to nuclear weapons after the downing and capture of Indian Air Force (IAF) fighter pilot Wing Commander Abhinandan Varthaman. The most visible was on 26 February, when a Pakistani army spokesman, DG ISPR Maj General Asif Ghafoor, announced that 'The Prime Minister has summoned a meeting of the National Command Authority [NCA]. I hope you know what the NCA means and what it constitutes'.[151] However, it appears that India also evoked the nuclear spectre via Research and Analysis Wing (RAW) chief Anil Dhasmana in a secret phone call to his then ISI counterpart Lt General Syed Asim Munir Ahmed Shah. During this call, 'Dhasmana was so blunt that even the ISI chief was surprised at how the RAW chief was going ballistic over Abhinandan's photographs'.[152] Prior to this call, it is reported that Indian Prime Minister Narendra Modi saw images of the Indian pilot and 'told the Indian intelligence chief to clearly communicate to Pakistan that New Delhi will stop at nothing if Abhinandan is harmed and demand his immediate release'. It is in this context that Modi is reported to have said 'Our weapon arsenal is not for Diwali'. In addition to the authorised phone call, Indian armed forces were also 'ordered to ready mobile Prithvi ballistic missile batteries in the Rajasthan sector. It set alarm bells ringing in faraway Washington'.[153] On 27 February, Pakistani Prime Minister Imran Khan announced that the pilot would be released a 'gesture for peace', but also warning of the dangers of miscalculation and that, if it occurred 'It will neither be in my control, nor in the control of [Indian Prime Minister] Narendra Modi'.[154]

The role of any such signalling will no doubt be debated for years to come, although there is apparent divergence in interpretation of any such signals. For example, interviews with the authors suggesting that broadly speaking, Pakistani Strategic Analysts believe Pakistani actions show considerable restraint and clear efforts to minimise nuclear signals, while Indian analysts (perhaps because Dhasmana's phone call was only reported after the event) point to the two statements as signs of overt signalling.

148 Sultan, India's Nuclear Doctrine: A Case of Strategic Dissonance or Deliberate Ambiguity.
149 Interview data.
150 Narang, Posturing for Peace? Pakistan's Nuclear Postures and South Asian Stability.
151 Ansar Abbasi, 'Hope India knows what NCA means?,' The News, February 27, 2019.
152 Shishir Gupta, 'A rare phone call, secret letter: How India got Pak to release IAF's Abhinandan,' Hindustan Times, February 27, 2021.
153 Gupta, A rare phonecall, secret letter: How India got Pak to release IAF's Abhinandan.
154 Helen Regan et al., 'Pakistan to free captured Indian pilot in effort to defuse Kashmir standoff,' CNN, March 1, 2019.

	What constitutes CMD?	How manifested in India?	How manifested in Pakistan?
Similarities	Emphasis on survivability	• Rail mobility • SSBN / SLBM development	• Road mobility + hardened shelters • Supported by mobility, deception and camouflage • Limited focus on SLCMs
	Low, but relative, numbers	• Defined in contrast to excesses of US/USSR • Numbers against China and Pakistan	• Defined in contrast to excesses of US/USSR
	Low alert status	• Disassembled warheads • De-mated weapons • No 'hair triggers' • Readiness estimated variously between 30 mins – 24 hours	• Disassembled warheads • De-mated weapons • No 'hair triggers' • Readiness estimated within 'a few hours'
	Targeting	• No counter-force	• No counter-force
	Signalling	• De-salience of loose talk	• De-salience of loose talk
Differences	Role of US	• No open discussion of Washington's role	• US intervention part of catalytic posture
	Role of China	• Perceived as strategic threat	• Strategic ally
	Command and control	• Shared responsibility between political, scientific and military establishments	• Highly integrated NC2
	Targeting plans	• Strictly counter-value	• No counter-force • Mix of counter-military first strike and counter-value
	Posture type	• NFU	• Catalytic posture, with asymmetric escalation
	Fuel cycles	• Combination of safeguarded and unsafeguarded facilities. • Enrichment and reprocessing • Three stage fuel cycle, requiring Pu for FBR programme • NSG member	• Combination of safeguarded and unsafeguarded facilities • Enrichment and reprocessing
	Deterrence type	• General	• General and immediate deterrence

Section 2: Regional Security Context



In addition to strategic stability, crisis stability is also of concern in South Asia. Although arguably separate concepts, the two are linked because India and Pakistan both undergo periodic crises which threaten to escalate.[155] Indeed, the 'sub-strategic' space is dynamic with new war-fighting concepts such as India's 'Surgical Strikes', and Pakistan's 'quid pro quo plus' representing the latest evolution of sub-strategic contest. Although both are designed to operate beneath the 'nuclear threshold,' as new and evolving concepts that remain relatively untested, national limits are yet to be understood – while the asymmetric strand of Pakistan's nuclear posture, based on response options, leaves open the possibility of unintentional escalation from conventional- to nuclear-domains.

Although the possibility that political crises may escalate to military and then strategic levels is well understood, less clear is the role that political, cultural, and emotional factors will play in any escalation and restraint.[156] As observed by Salik, and others, 'South Asians have peculiar value systems, emotive tendencies and a proclivity for risk taking'.[157] This is compounded by further differences in strategic cultures with Pakistan's security-driven perspective – informed by loss of East Pakistan (Bangladesh) in 1971 and the conviction that they would ''never again' suffer defeat and dismemberment'[158] – standing in contrast to India's prestige-based motivations and the sense of Indian exceptionalism.[159]

Although South Asia's cultural and emotional complexities are often overlooked by observers, particularly those which solely focus on military capabilities, the interplay of these complexities is implicitly explored by the various Strategic Analysts who act as an interlocutor between government and domestic audiences. In contrast to the somewhat dry language of government, on security affairs Strategic Analysts may draw upon a broad range of theoretical frameworks, historical narratives and/or domestic political agendas to frame events.

However, one area of divergence between domestic and international analysts appears to be their general confidence in deterrence frameworks. This division is implicit to writings on nuclear issues, although to better understand this, during the Roundtable, Indian and Pakistani Subject Matter Experts (SMEs) were asked to describe whether they defined themselves as 'deterrence optimists', 'deterrence pessimists' or neither. During this the vast majority defined themselves as deterrence optimists. Though only anecdotal, this and general writings suggested a clear philosophical difference between scholars from outside India and Pakistan and their Indian and Pakistani counterparts who generally believe that the benefits of nuclear deterrence outweigh the potential risks associated with nuclear weapons.

A second difference appears to be the nature of the 'nuclear taboo'. Defined by Tannenwald as the 'normative inhibition against nuclear first use', discourse of the taboo exists in the region, although 'the taboo itself is fragile'.[160] However, similar to other concepts, it appears the nuclear taboo also manifests differently in South Asia. For example, a reading of the literature shows conspicuous gaps in areas of discussion across both Indian and Pakistani nuclear programmes, suggesting that rather than being confirmed to inhibitions against first use, the concept of 'taboo' has a more expansive and subtle meaning to include areas of unspoken acknowledgement – elephants in the room – which create a lacuna in nuclear discussion. For example, Rajagopalan divides the Indian strategic community into two broad camps: 'those who largely support the current doctrine, the moderates; and those who would revise it significantly to make it more aggressive, the expansionists'.[161] Despite their different outlooks, however, as Koithara notes

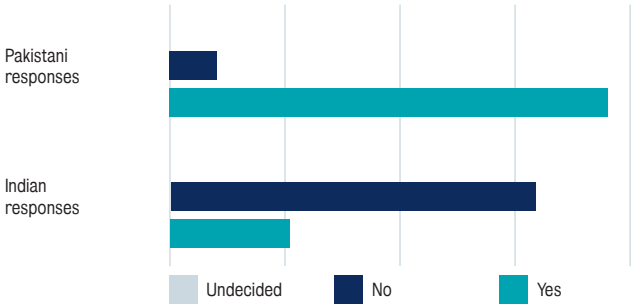
155 Dalton, Signaling and Catalysis in Future Nuclear Crises in South Asia: Two Questions after the Balakot Episode.
156 Interview data
157 Salik, The Evolution of Pakistan's Nuclear Doctrine, 73.
158 Khan, Eating Grass: The Making of the Pakistani Bomb, 70.
159 Paul, Foregrounding India's Nuclear Responsibilites.
160 Nina Tannenwald, Twenty-three Years of Nonuse: Does the Nuclear Taboo Constrain India and Pakistan?, Stimson (Washington D.C., 2021).
161 Rajesh Rajapopalan, India's Nuclear Doctrine Debate, Carnegie Endowment for Peace (Washington D.C., 2016).

'both doves and hawks skirt operationalisation issues in India. Doves fear that greater operationalisation will lead to force expansion and risk enhancement, while hawks worry that discussions about operational matters will weaken the image of India's current capability'.[162] Similarly, with Pakistani analysts, there are notable themes which attract less discussion, for example, discussion of nuclear weapons as warfighting instruments. On one hand, such use is implicit through the development of the Nasr missile, however, prevailing Pakistani attitudes encourage restraint and the framing of tactical systems as instruments of warfighting are discouraged.

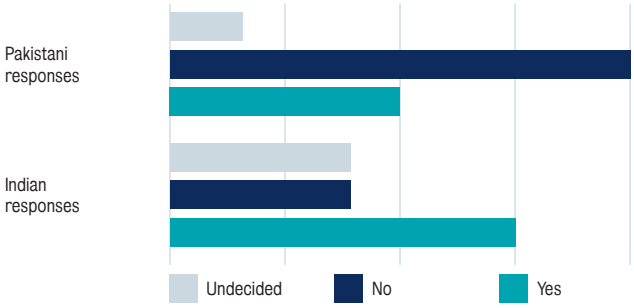
In addition, at this study's roundtable event and accompanying expert survey the organisers asked the Strategic Analysts from India and Pakistan about their perceptions on whether the nuclear doctrines of their respective countries were well understood. Results were then broken down by nationality of respondents. To the question: 'Is India's nuclear doctrine correctly understood by Pakistani decision makers?,' most Indian respondents answered 'no' while most Pakistani respondents answered 'yes'. Similarly, when asked 'Is Pakistan's nuclear doctrine correctly understood by Indian decision makers?' most Indian respondents answered 'yes' and most Pakistani respondents answered 'no'. Although only anecdotal, such answers support the notion of miscommunication. Although representatives may feel they understand neighbouring nuclear doctrines, their own national programmes are not well understood by neighbouring states.

Regarding the balance between crisis and deterrence stability, when asked whether India and Pakistan might have strategic stability, but not crisis stability – most Indian experts answered 'no' while the Pakistani experts were evenly divided between 'yes', 'no' and 'somewhat'.

Is India's nuclear doctrine correctly understood by Pakistani decision makers?



Is Pakistan's nuclear doctrine correctly understood by Indian decision makers?



Risks to South Asian Security

To enhance literature review, interviews and further surveys were used to further explore the regional security context in South Asia. Both expert and public surveys included the question 'What do you consider to be the greatest risks to South Asian security?'.[163] Based on interviews, survey participants were given the option to choose multiple answers, from climate change, conventional conflict, the economy; foreign influence; Jammu and Kashmir; national leadership; nuclear conflict; public opinion and media; regional rivalry; technological developments; terrorism; and 'other'.

None of the Indian experts answered 'nuclear conflict'. From the public survey, slightly more Pakistani participants responded with 'nuclear conflict' than the Indian participants – but it was

162 Koithara, Managing India's Nuclear Forces, 10.

163 Relevant survey questions were drawn from discussions that took place during the interviews.

not the greatest security concern for either group. The greatest risk indicated by all groups across all surveys was 'terrorism'. This was indicated more often by the Indian respondents than the Pakistani respondents however, which was in line with the expert interviews as well: terrorism originating from Pakistani territory was often mentioned as a great concern.

Notably, topics such as the national economy and regional climate change were indicated as a risk far more often by the general public from both countries as opposed to Strategic Analysts. Indeed, India has the third highest gross carbon emissions in the world (after China and the US), and it is at a high risk for extreme weather events. To many in Southern Asia, the impending risk of natural disasters outweighs the more abstract threat of nuclear attack.[164] Responses such as these demonstrate that strategic ideas are in stark contrast with more general understandings of key concepts. When the public was surveyed about 'deterrence', and asked to explain what it meant, the word 'nuclear' was mentioned by 14% of Pakistani participants and 18% of Indian participants (further see Appendix I). Moreover, while the experts the authors spoke to and surveyed conveyed more detailed and nuanced views of deterrence, it should be noted that they did not address fear or anxiety; and the public did not address signalling or politics.

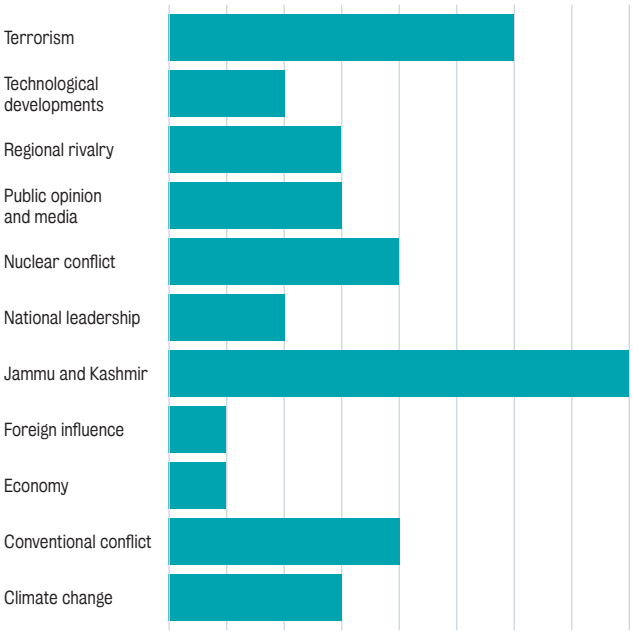
Although both Indian and Pakistani experts answered 'Jammu and Kashmir' as the greatest risk to Southern Asian security, two of the Pakistani respondents answered with only 'Jammu and Kashmir'. This is also reflected in the answers from the general public, where 'Jammu and Kashmir' was mentioned more often by Pakistani respondents. What is more, none of the other nationalities that participated in the expert survey responded 'Jammu and Kashmir', indicating that this potentially remains an underestimated area of sensitivity in the international community.

Jammu and Kashmir has been a disputed region since the division of the subcontinent in 1947. Both India and Pakistan (as well as China) claim parts of the territory, and it is currently separated by a Line of Control (LoC). Multiple wars have been fought in and over the area, and the region has continuously been subject to bursts of violence between various groups. Especially during the 21st century, bilateral dialogue processes have attempted to work toward family re-unification and re-establishment of trade – but the 2008 Mumbai terrorist attacks, as well as events in Pathankot in 2016 and Pulwama in 2019, have led to renewed military tensions. Since the dispute exists beyond the region itself, on a national and international level, it also plays a role in nuclear deterrence in South Asia. It is often abbreviated to 'the Kashmir problem',[165] a three-word phrase which hardly explains the day-to-day situation of the c. 12 million people who live there.

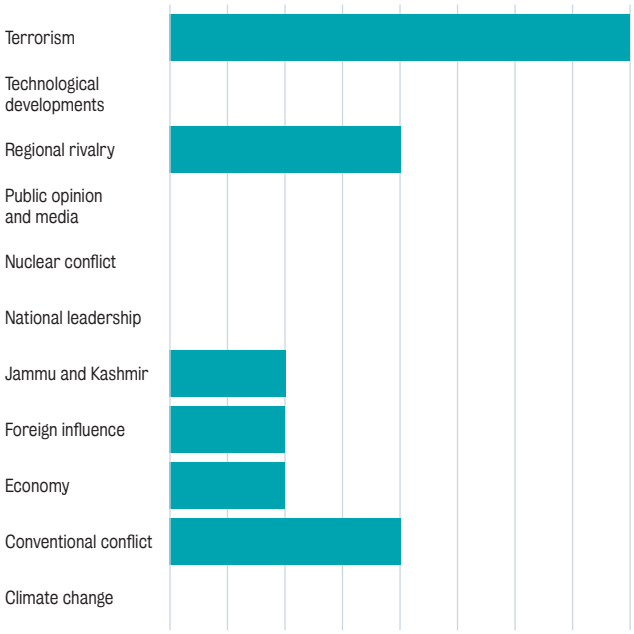
164 N. S. Khadka, 'Climate change: The IPCC environmental warning India cannot ignore,' BBC World Service, August 10, 2021.

165 F. Shakoor, 'Nuclearization of South Asia and the Kashmir Dispute,' Pakistan Horizon, 51, no. 4 (1998): 67-79. Amit Srivastava, 'Aspects Of The Kashmir Dispute,' World Affairs: The Journal of International Issues, 14, no. 4 (2010): 72-91.

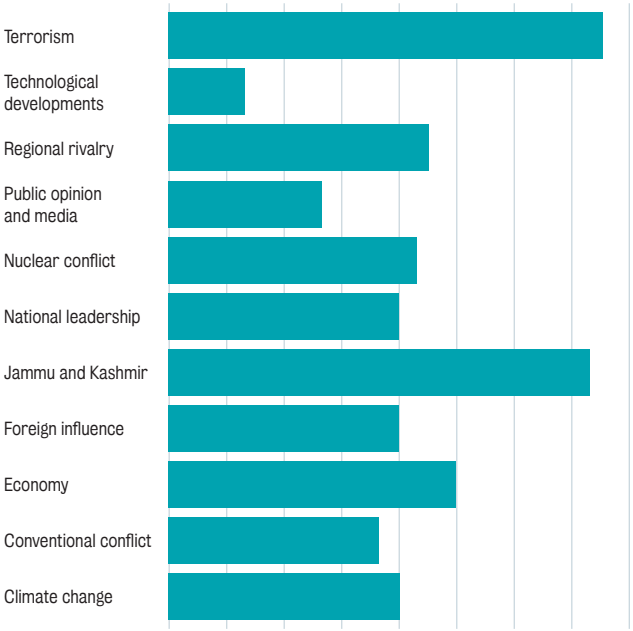
Greatest risks to South Asian Security
Pakistani experts



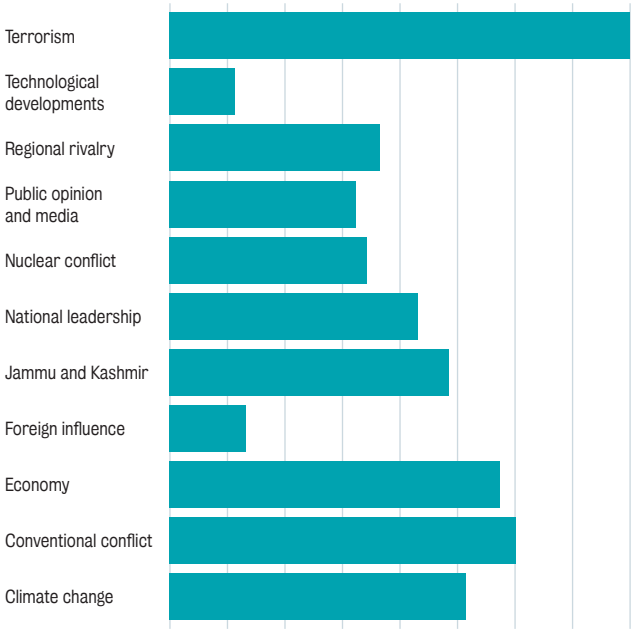
Greatest risks to South Asian Security
Indian experts



Greatest risks to South Asian Security
General public – Pakistan



Greatest risks to South Asian Security
General public – India



Almost any mediator will advocate for the practice of active listening,[166] in order to shift emphasis from competitive national security perceptions toward cooperative and interdependent arrangements.[167] Yet in the case of India and Pakistan, these discussions are often held in secret – with the public only learning about them afterward and leaving very little opportunity for them to be heard. This is in part because in the past it was found that involvement of public complicated potential negotiations and peace initiatives. A recent example of secret negotiations occurred in the spring of 2021, when rumours emerged that 'top intelligence officers' had been discussing de-escalation in Jammu and Kashmir, in talks lead by the UAE. The UAE

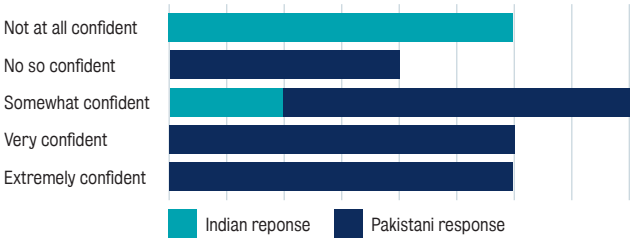
166 Brixley-Williams, Spilman, and Wheeler, The Nuclear Responsibilites Toolkit.

167 A. W. St John, 'Third Party Mediation over Kashmir: A Modest Proposal,' International Peacekeeping, 4, no. 4 (1997): 1-30.

presumably shares some of the risk perceptions present in Southern Asia, namely a concern for stability in Afghanistan and Pakistan, and terrorism in the wider region.[168]

Most Indian experts interviewed and surveyed for this project appeared pessimistic about mediation, while most Pakistani experts were confident it would be beneficial. This is reflective of the fact that India considers Kashmir a bilateral issue, unlike Pakistan. India insists on the Shimla Agreement of 1972, when both countries agreed to Point I ('the principles and purposes of the Charter of the United Nations shall govern the relations between the two countries').[169] In addition, experts were asked which third party, if any, should lead any such mediation. One Indian expert elaborated with 'no third party mediation will be possible because no third party is commonly recognised as impartial by both countries', but another suggested the UAE or KSA. The Pakistani experts almost all mentioned the US as a suitable third party. Other suggestions were Russia, and, specifically, avoiding China. One Pakistani expert noted that 'part of the problem is that there isn't an obvious honest broker. The two states with the power to influence the situation are seen as either highly partial (China) or belligerent and sanctimonious (the US in particular and western countries more generally).'

Confidence in a third party having a decisive rolein mediating future crises between India and Pakistan



Confidence Building Measures

The discussion of mediation also touched on Confidence Building Measures (CBMs). This is an extremely challenging subject, in a region where the international debate is dominated by nuclear weapons and the local debate by access to food and housing. There are few conflicts where the compatibility between issues is so vast. Specifically, there is a notable difference between 'confidence building measures' and 'nuclear confidence building measures'. Both, again, derive from the Cold War, and are used as a tool to build trust between countries – but while the first can include factors as broad as interpersonal communication, the latter focusses on military measures and armed conflict. The questions here are, how confidence building measures are viewed by different communities, and what language is used when discussing them.

Over the years, Indian and Pakistani CBMs have included crisis communication hotlines (1971 and 1989); non-attack of nuclear facilities (1988); pre-notification of military exercises (1991) and ballistic missile flight tests (2005); non-violation of airspace (1991); non-harassment of diplomatic personnel (1992); and ballistic missile flight tests (2005).[170] It has been debated, however, whether or to what extent these past measures have been effective. A more recent example is the cease fire agreement on the LoC (2021), which played a significant role in diluting tension between the two countries.

It is worth noting that all experts interviewed for this project spoke, without fail, about CBMs in a nuclear context first and foremost. On the other hand, the public that was surveyed rarely associated confidence building with nuclear deterrence at all. Their response formed a strong contrast, as they rarely brought up military measures or weapons (see Appendix I).

Experts were asked whether nuclear CBMs are still considered useful, and what they might look like. The general consensus from participants from both countries was that they would be useful. Many struggled to put into words what these measures might entail however. Suggestions included policy reassurances regarding NFU, decreasing defence budgets,

168 'UAE is mediating between India and Pakistan, says senior diplomat,' Reuters, April 15, 2021.

169 'Simla Agreement,' in Simla Agreement (July 2 1972). https://www.mea.gov.in/bilateral-documents.htm? dtl/5541/Simla+Agreement.

170 Christopher Finnigan, 'Can confidence-building measures repair the mistrust between India and Pakistan?,' in LSE South Asia Centre (June 6 2019). https://blogs.lse.ac.uk/southasia/2019/06/06/can-confidence-building-measures-break-the-impasse-between-india-and-pakistan/.

signing the NPT, a ban on 'heavy-calibre' weapons on the LoC, limiting the number of nuclear weapons, and the elimination of ballistic missiles from both arsenals. Several Pakistani experts addressed Kashmir, saying 'the biggest confidence building measures would be to put Kashmir on table and solve it' as well as 'reducing the number of troops in Kashmir'. A UK expert also added 'Military-to-military, political-to-political, diplomatic-to-diplomatic, scientist-to-scientist: bringing together the strategic communities on both sides of the divide'.

Yet one theme that also emerged was one of 'CBM fatigue', wherein the almost endless insistence on engagement without progress is exhausting the enthusiasm for new CBMs. And although numerous initiatives have been suggested, with recent examples including those compiled by the IISS,[171] CBM fatigue suggests more creative means should be considered, possibly even eschewing international cooperation in the short-term. For example, by reporting on national programmes to Parliamentary institutions to provide measures of transparency and accountability. Regardless of how New Delhi or Islamabad seek greater cooperation, one thing is clear: Governments, Strategic Analysts, and the public are all having separate, parallel conversations about risk perception and trust building in Southern Asia. While there is a consensus and understanding that these conversations would benefit from overlap, few institutional mechanisms currently exist.

171 Levesques, Bowen, and Gill, Nuclear deterrence and stability in South Asia: perceptions and realities.


Triff

Section 3: The Significance of Situational Semantics

Security context, risk perception and confidence building measures all feed into the final question of this study: how do differing interpretations by respective communities affect meaning-making in Southern Asia? This has formed an important part of the deterrence discussion for some years now, with acknowledgement that discourse not only enables actors to communicate and understand reality – but also that discourse can shape reality.[172, 173] Even during the Cold War, in a survey conducted in the 1970s, only two per cent of respondents could 'correctly' define the meanings of nuclear jargon ('deterrence' itself was misidentified as a detergent and a deodorant, amongst others).[174] What is more, challenges in translation also quickly rise to the surface when considering the meaning of deterrence. Translation from and to Russian makes an interesting example ('containment' versus 'compellence' versus 'intimidation'), but to name a few others, so do Greek (literally translated as English 'prevention') and French (literally translated as 'dissuasion').[175, 176] These near-synonyms are not only a matter of available vocabulary but, particularly, of context.

Moreover, such an observation is more than academic and the fact that '[t]he two sides have not adopted a common strategic lexicon' may have real-world consequences.[177] For example, on 21 February 1999 an Agreement Between India and Pakistan was signed on Pre-Notification of Flight Testing of Ballistic Missiles.[178] However, different understandings over notification requirements and the Indian testing of a SLBM created ill will and played a role in preventing future agreements on notification of cruise missile tests.[179] Other areas of semantic disagreement stem from the geographical asymmetries between India and Pakistan – Pakistan is long and thin, thus lacks strategic depth; while India is geographically larger and in a military conflict can afford to trade space for time. The impact of this asymmetry is that, in South Asian context, a missile with, for instance, a 500 kilometre range may be considered short-range, but it also has strategic potential. Indeed, even India's close-ranged Prithvi missiles, which were developed as a 'battlefield support missile', are able to reach cultural centres such as Lahore and are thus considered strategic missiles.[180]

In addition to range, such considerations have further implications for storage and deployment, with 'forward storage' from an Indian perspective having a real potential to becoming operational deployment because even 100 kilometres away from the border can still reach major Pakistani population centres. Such distances are often not appreciated by external audiences. For example, following the 1998 nuclear tests, the US dispatched arms control expert Robert Einhorn to the region, with a US demand that 'the storage of ballistic missiles and launchers be separated by at least 100km and also to be located at least 100km from the border with India'. To this demand came the query whether 'someone in the United States had cared to research Pakistan's size and physical geography' before suggesting such distances.[181] Compounding these issues is the fact that both countries use nuclear delivery vehicles and non-nuclear delivery vehicles, which are inherently nuclear capable, even if they are not nuclear certified or armed. The imprecision of terms such as 'nuclear capable' means the capacity in which missiles such as the Prahaar will be deployed remain debated. Due to the relative

172 On meaning-making, see J. W. Pennebaker & B. L. Banasik, 'On the creation and maintenance of collective memories: History as social psychology,' Collective memory of political events: Social psychological perspectives (Hillsdale, NJ, US: 1997).

173 Amir Lupovici, 'The Emerging Fourth Wave of Deterrence Theory—Toward a New Research Agenda,' International Studies Quarterly, 54, no. 3 (2010): 705-732.

174 Neil Postman, Crazy Talk, Stupid Talk: How We Defeat Ourselves by the Way We Talk and What to Do About It (New York: Dell, 1977).

175 Many languages only use one word for 'security' and 'safety', including Hindi. Further see Zenobia S. Homan, Yara Shaban & Fadime Özge Özkan, 'The Language of Nuclear Security - New Case Studies,' INMM/ESARDA Joint Annual Meeting Proceedings (2021).

176 P. H. Vigor, 'The Semantics of Deterrence and Defense,' in Soviet Naval Policy: Objectives and Constraints (New York: Prager, 1975).

177 Salik, The Evolution of Pakistan's Nuclear Doctrine.

178 'Agreement Between India And Pakistan On Pre-Notification Of Flight Testing Of Ballistic Missiles,' in Stimson (February 21 1999). https://www.stimson.org/2012/agreement-between-india-and-pakistan-on-pre-notification-of-flight-tes/.

179 Interview data.

180 Interview data.

181 Khan, Eating Grass: The Making of the Pakistani Bomb, 291-93.

nature of such terms, the authors anticipate that either new lexicon, or new meanings associated with existing lexicon will be required. This will complicate expression, while differing interpretations by respective communities may give rise to the potential for discussion to lose cohesion and focus.

As described in previous sections, in India as well as Pakistan nuclear deterrence has also become part of the national identity – and dialogue can be abstract, formalised, and institutionalised. However, communication is anything but those things: it can be assertive, directive, commissive and above all expressive.[182] The language of deterrence needs to be connected to the reality of the environment in which it is used. Already in the 1980s, scholars questioned what terms like 'vertical proliferation' and 'horizontal escalation' even signified any more – noting 'when the government applies past language to present events, and when the conditions of life are changing rapidly, that may result in a serious discrepancy between the words and what they stand for'.[183] In the words of Lawrence Freedman, '[t]he concept (of deterrence) itself is simple enough… [however] it is not so straightforward when it comes to implementation'.[184]

At the basis of deterrence dialogue, central concerns include resolve and credibility. Who feels threatened when, and why; and how they choose to express this, or not. Such issues are all the more acute between India and Pakistan, because of their geographic proximity. Therefore, in the project interviews and surveys, particular attention was paid to individual views and experiences. In doing this, two important questions materialised: Do existing policies reflect these views? And should they? While some contrasts between India and Pakistan are evident, considerable agreement also exists. In fact, the greatest contrasts in the significance and purpose of nuclear deterrence seem to lie between 'Strategic Analysts and the general public, rather than between countries.

Public Awareness and Opinion

Although the nuclear deterrence debate is led by high-level strategic decision-makers, these function in political eco-systems influenced by wider society. In a 1998 paper, scholars criticised India and Pakistan for the notable absence of data on public opinion, citing the existence of a handful of foreign surveys and 'hastily arranged' newspaper polls – which failed to compare and contrast between the two countries – and noting that 'a policy that is inconsistent with the views of the majority will be unsustainable over the long term.'[185] Their own surveys at the time, conducted primarily amongst middle and upper class educated men, found substantial support for government policies (57% in India, 61% in Pakistan) with little interest in renunciation of nuclear weapons (8% in India, 6% in Pakistan). So, what kind of language is used to raise awareness of nuclear deterrence, and how is public opinion used in communication?

In 2016, the Stimson Centre published an updated view of Indian nuclear attitudes. They determined that the general public has largely not connected electricity generation with nuclear issues, and that the public's limited interests in nuclear issues aligns with similarly low perceptions of foreign policy (prioritising access to water, food, and housing). The public as a whole is largely supportive of nuclear power – but support for nuclear energy is much lower in communities where large nuclear power plants are located. However, these views are not often consistently broadcast beyond the immediate areas in question. In general, the public is also considered supportive of the Indian nuclear weapons programme, viewing it as a symbol of the country's technological progress, self-confidence, and international prestige. With that said, it is difficult to disentangle whether these

182 Juha A. Vuori, 'Deterring Things With Words,' New Perspective, 24, no. 2 (2016): 23-50.

183 M. Gyi, 'Semantics of Nuclear Politics,' ETC: A Review of General Semantics, 41, no. 2 (Summer 1984): 135-147.

184 Freedman Lawrence, 'Introduction – The Evolution of Deterrence Strategy and Research,' in Netherlands Annual Review of Military Studies 2020 (The Hague: T.M.C. Asser Press, 2020).

185 Samina Ahmed, David Cortright, and Amitabh Mattoo, 'Public Opinion and Nuclear Options for South Asia,' Asian Survey, 38, no. 8 (1998): 727-744.

views may persist only because of the public's passive stance on nuclear issues. While Indian society has moved beyond sole dependence on government-controlled broadcast media, nuclear discourse is still calibrated by a small clique of Strategic Analysts composed of elite think tanks, civil society institutions, and academia. The report critically cites the fact that data from rural areas, those who do not have access to the internet, and those who do not use English remains woefully underrepresented.[186]

Although nuclear weapons remain popular, the general lack of qualitative public engagement contributes towards a slowing civil society engagement and a lessening of government accountability. Rana notes how the 'deification' of nuclear weapons provides a social pressure against the scrutiny of nuclear weapons where 'any opposition to the proliferation or development of nuclear weapons is deemed unpatriotic and against national interests'.[187] Ultimately, this will be counter-productive because '[t]his narrow-minded rhetoric further weakens citizen participation in debates regarding nuclear weapons. [...] this prevents the democratization of the debate and concentrates power further in the upper echelons of the state'.[188]

To help understand how nuclear issues are understood in India and Pakistan more generally, this project commissioned two surveys to ask what nuclear weapons meant to people. Prolific Academic recruited a random sample of participants from both countries.[189] Participants were asked to write their responses in either in Hindi or Urdu.[190] Although the limited sample size of these surveys means findings are tentative, they should be seen as exploratory, and aimed to highlight the scope of future directions in research and to contribute to better comprehension.

In Urdu, some participants explained nuclear weapons by referring to scientific information such as 'you may have heard of atoms and isotopes in science classes at school', 'countries that use uranium could be devastated by the fusion process' and 'a device designed to release energy in an explosive manner as a result of nuclear fusion, nuclear fission, or a combination of both'. Several participants mentioned Hiroshima and Nagasaki, and multiple participants referenced large-scale destruction. A few participants noted their opinion: 'I am strongly against them, I consider it for national defence, but I don't think countries should be proud of it', '(they are) weapons that are made for your own protection', and 'instead of nuclear weapons now there is the bio war in the world'. However, one person also wrote 'no meaning – I have only heard about it on the news' and several wrote 'I don't know'.

In Hindi, some participants responded with scientific answers as well, eg 'a nuclear bomb is a type of explosive weapon that uses nuclear reactions via nuclear fission or fusion' and 'weapons, which run by a nuclear chemical reaction'. Several participants also expressed concern for the environment. A handful of respondents referred to power balance and national security: 'nuclear weapons are the biggest weapons of an army', 'nuclear strategy is essential for self-defence', 'nuclear weapon means that the country has progressed and when the time comes, it can protect its country and keep its soldiers safe.' However, all other participants expressed a negative view, suggesting nuclear weapons should be illegal and that they are 'a kind of poison', 'not good for the world' and 'not appropriate to use them under any circumstances'. Several respondents included strong opinions: 'to me they mean extremist mindset - they represent hatred and a lack of citizenship' and 'it is destruction

186 Malhotra, Assessing Indian Nuclear Attitudes.

187 Ankit Rana, Towards Nuclear Disarmament In South Asia: What Can Civil Society Do?, South Asian Voices (Washington D.C., 2017).

188 Rana, Towards Nuclear Disarmament In South Asia: What Can Civil Society Do?

189 The final survey included 50 participants from India and 50 participants from Pakistan. Occupations covered students and home makers as well as fields such as data analysis, car sales, dentistry, engineering, nursing, hospitality, retail, finance, and public health. Participants were aged between 20 and 60. Although this does not come near covering a representative sample of the population for either country, and it does not address the issue of reaching those without internet access, it does include non-English data from non-elites.

190 The majority of participants indicated knowledge of more than two languages (besides Hindi and Urdu, languages that were recorded were Punjabi, Sindhi, Marwari, Pothwari, Bengali, Kannada, Malayalam, Tamil, Marathi, Telugu and Gujurati—as well as French, Dutch and Spanish).

path towards the end of peace, humanity and democracy.' Many responses related to the dangers nuclear weapons pose: 'disaster', 'major threat', 'harmful', 'something that could end the world', 'digging our own grave' and 'end of humanity'. Hiroshima and Nagasaki were also mentioned. One participant suggested that 'there should be such a treaty between every country of the world that nuclear weapons should be banned, and use only nuclear energy.' – suggesting they were unaware, but supportive, of such ongoing international negotiations. Two participants admitted not knowing much about nuclear weapons, but none responded with only 'I don't know'. Notably, it has been pointed out in the past that the rate of 'don't know' responses in surveys is higher for low-income groups in India, while workforce participation, level of education and urban residency result in more detailed responses.[191]

Overall, while these responses do not indicate a lack of support for government policy, they do represent a strongly divergent attitude toward nuclear weapons. The idea of 'nuclear optimism', was not echoed here. Nuclear strategy more generally however was mostly accepted as a 'necessary evil' required for self-defence. However, recent evidence from both India and Pakistan shows that the South Asian public are not passive bystanders in the development of foreign policy.[192] The surveys referred to here were conducted in a period during which no attacks occurred – but escalatory public sentiment, sparked by renewed fear, anger and rivalry, can be a potential driver of crisis.

A 2008 survey amongst adults living in urban areas in Pakistan concluded that the public was 'lukewarm' about their government's ability to uphold democratic principles, not convinced that elections would be free and fair, sceptical about the independence of law courts, politicians and the military, and they expressed little confidence in the president or police. In contrast, they declared high confidence in the abilities of the armed forces.[193] In a 2018 survey which focussed on broad national representation (including gender balance amongst respondents), people indicated they had seen improvements in terms of corruption and law and order, with some also indicating more confidence in the government and economy. The majority of respondents said that they obtain most their information from television media, finding it trustworthy. At the same time, more than half of the participants said that they do not have access to the internet. Areas which were considered to be 'heading in the wrong direction' were inflation, unemployment and poverty, but also national leadership. The security situation was described as 'bad' by about a third of respondents; with political stability ranked as 'bad' or 'very bad' by more than half of respondents. When the participants were asked about Prime Minister Khan and locally elected representatives, over a third of people thought they were doing badly. Democracy on the other hand was rated 'good' by more than half of participants, and in 2018 three quarters of people still strongly approved of the army. Most participants also thought election results had been accurate, fair and transparent.[194]

The question is, to what extent public opinion influences leadership at all in Southern Asia. Although answers were varied, participants in the surveys conducted for this study, from both countries, agreed that Indian leadership was more likely to be influenced by public opinion than Pakistani leadership. This is in line with the opinion of policy analysts, who have recognised the importance of public perception in the rise of the Modi administration. Public opinion in India 'mediates the relationship between policy choices and how it is framed by the government to bolster its image'.[195] Amongst other things, this has resulted in hyper-nationalist rhetoric accompanying cross-border conflicts with

191 Aidan Milliff, Paul Staniland, and Vipin Narang, Uneven Accountability? Public Attitudes on Indian Foreign Policy since the 1960s, MIT Political Science Department Research Paper (Cambridge, MA., 2019).

192 Christopher Clary, Sameer Lalwani, and Niloufer Siddiqui, 'Public Opinion and Crisis Behavior in a Nuclearized South Asia,' International Studies Quarterly (2021).

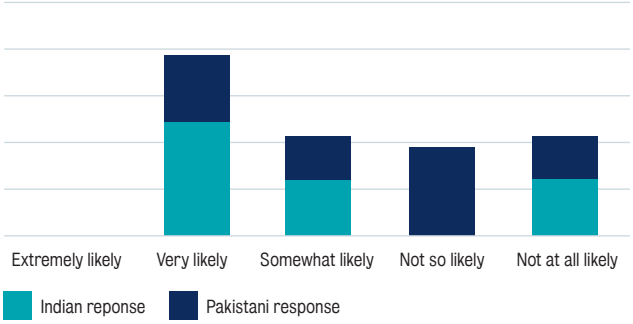
193 Christine Fair, Clay Ramsay, and Steve Kull, Pakistani Public Opinion on Democracy, Islamist Militancy, and Relations with the U.S., Institute of Peace (United States 2008).

194 National Survey of Public Opinion in Pakistan, Institute for Pakistan Public Opinion Research and Redstone Scientific (Islamabad, 2018).

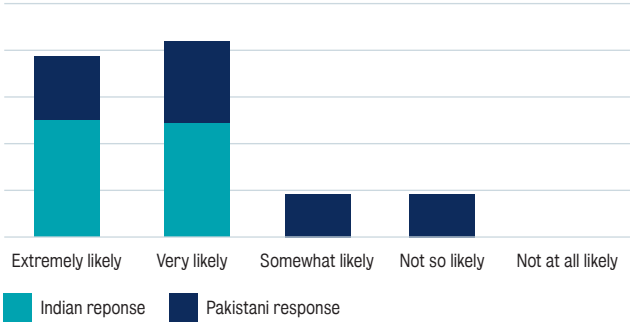
195 Iyer Prithvi, Understanding the Indian Public Opinion-Foreign Policy Relationship, ORF Occasional Paper (New Delhi, 2020).

Pakistan. For example, Modi's approval ratings doubled in the aftermath of the Balakot strikes. The way in which the government frames crisis, and how it is seen to respond to it, does not only have an impact on national audience; the perceived reaction of the public also in part determines the response.

In the event of a crisis would public opinion be likely to influence the way the Pakistani government responds?



In the event of a crisis would public opinion be likely to influence the way the Indian government responds?



With that said, a survey recently conducted in the Punjab region of Pakistan found that the public there has a preference for escalation over de-escalation in the event of provocation, and that public pressure can encourage leaders to engage in conflict when they had no prior track record of doing so. The difference here seems to be in Pakistani trust in the army over government, with survey respondents indicating they were more likely to support such decisions if they were made by the military.[196] Significantly, the researchers also investigated whether the public could be swayed toward greater support for de-escalation through references to the potential costs and dangers of nuclear conflict – and found that while this did create somewhat more understanding for de-escalating decisions it did not necessarily result in more support.

These data all reflect who feels threatened when, and why; and how they choose to express this, or not. It is difficult for policies to accurately reflect the recorded views, as they rarely cover a representative sample of the population. Consequently, the aim of the surveys conducted for this project was to sketch an idea how public in India and Pakistan think about strategic issues, and what their basic understanding of nuclear weapons is. Respondents had a mixed approach towards nuclear weapons: regardless of level of education, most participants did not have an understanding of strategic issues that could be compared to Government or Strategic Analysts, and the element of the other country being a rival state was dominant in both countries.

Information Access

The difference in knowledge of nuclear deterrence between experts and public is not surprising. The question is, does it matter? Access to openly available information in both Pakistan and India is limited. Pakistan's internet freedom is currently rated 'not free', and its press freedom is ranked 145 out of 180. India's internet freedom is classified as 'partly free', and its press freedom 142 out of 180.[197] What is more, a large proportion of children in Southern Asia does not have access to formal education, with vast differences existing between regions and communities as well as aspects such as gender.[198] There are multiple governing boards, and it has been argued that some educational policies are politicised. Even then, primary and secondary history curricula mainly address the origin of the nation and the struggle of great leaders who contributed to independence. Nuclear programmes are not mentioned at this level, and most people will only develop an interest in them if they follow Southern Asian politics, particularly through social media. At university, nuclear weapons are covered in degrees that relate to strategy or International Relations;

196 Clary, Lalwani, and Siddiqui, Public Opinion and Crisis Behavior in a Nuclearized South Asia.

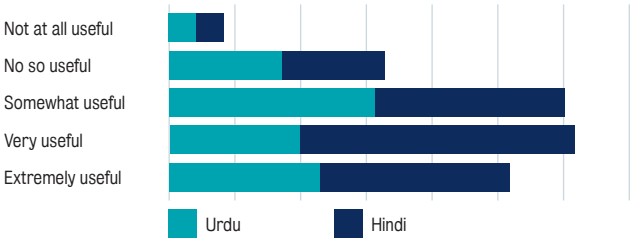
197 Freedom on the Net: Pakistan, Freedom House (Washington, D.C., 2021); Freedom on the Net: India (2021), Freedom House (Washington D.C., 2021); World Press Freedom Index, Reporters Without Borders (Paris, 2021).

198 Pakistan Education Programme, UNICEF (New York, 2021), India Education Programme, UNICEF (New York, 2021).

but in India alone there are over 1000 university or university-like institutions, so it is difficult to determine exactly what subject matter materials are covered. Both countries, but especially Pakistan, are significant exporters of international students – meaning that at this stage audiences consume international curricula and media than national sources of information.[199]

It was not within the scope of this project to conduct a detailed regional media survey, nor to analyse the wide range of regional education systems that are in use in Southern Asia. However, the authors did question Strategic Analysts and public on information availability and awareness of nuclear deterrence more generally. All groups of surveyed participants were asked about education on nuclear deterrence and related strategic matters. Consensus from both Indian and Pakistani respondents was that the level of education on these subjects could be improved, and that it would be useful to educate the public further. Specifically, the public was asked whether it would be useful to do this in languages besides English as well, to which the majority responded that it would be.

Usefulness of information on nuclear weapons and nuclear strategy in Urdu and Hindi



Respondents from Pakistan wrote that they think 'ordinary people' are not necessarily familiar with English' and 'many Pakistanis who do not have access to English do not know much about this subject' as well as 'there is no Urdu terminology for many words or it is very difficult and people are unfamiliar' and that people are 'illiterate about nuclear deterrence and technology'. They commented that many people in South Asia as a whole know Urdu, and therefore this is an important language to use to inform people about nuclear weapon issues. Respondents from India wrote that it is 'good to have information in as many languages as possible'. They pointed out that 'additional knowledge about nuclear weapons and its terminology will help in creating greater awareness'. On English, many participants raised that not everyone knows English, and that it is not helpful to limit information only to those who know English.

Criticism recorded from the surveys included that peace efforts around the world are more important than the language in which these are made. One participant added that they work in IT 'so even if I don't know much it is fine' and that it is 'good at certain level but not more than that'. Someone also pointed out that nuclear issues are 'more difficult to understand in Urdu than English' because of terminology that is already in use: 'most people in English know what nuclear fusion and fission means, but if we students or people in Urdu try to make people understand the same thing, it will be very difficult.' One person also worried that widening awareness could be negative, as people may use it to seek 'revenge' or 'associate with certain organisations' and 'it could be a boost of aggression and oppression'. Another added that nuclear information 'should not be promoted, given the negative media against our country already'.

Furthermore, there was also some objection to the idea of furthering education and awareness: one participant said that it is unnecessary to educate people about nuclear warfare as they do not have 'a say in these matters' and to trust the government to be aware of the issue and alternatives. Someone also pointed out that the general public is unlikely to have an opinion on nuclear weapons, as 'it does not affect their daily life as much as other necessities like food, water, electricity, employment'. In addition, it was mentioned that information is available on the internet for those who want it, and one participant said they understand the information better in English than any other language.

With that said, several respondents referred to 'misinformation' and 'state-sponsored media biased against such controversial issues' saying that this 'keeps ordinary people ignorant'.

199 Robert Hunter, Education in Pakistan, World Education News + Reviews (Online, 2020).

They said that it is necessary for people to learn about the power balance in the world, and potentially 'put pressure on the government' to limit the use of nuclear weapons. Participants also echoed that there may not be a clear understanding nationally of why and when nuclear weapons would be used, and that there needs to be more awareness of regional tension and the dangers of nuclear weapons. Various respondents also referred to politics, saying that if the information were available in more languages, 'no political party will be able to misuse this issue' and that it would help people 'make an informed decision about not choosing a government that supports this agenda.' A few participants expressed their opinion quite strongly, referring to recent elections and leaders, with one person writing 'education looks like the lowest tier of priority'. One participant specified 'by having such information in Hindi in villages and in small cities, some people will get more attention on this subject and there will be participation in the nation's policy.' Notably, respondents to both surveys raised issues with national government. Although not directly expressed, in Pakistan there was some concern for the relationship between awareness of nuclear issues and extremism; while in India some spoke out against what they perceived as enforced ignorance.

Many participants referred to a broader sense of education, awareness and community around nuclear weapons, 'so that they can all come together and prevent them from being used anytime'. One wrote 'it should be known about the stories of the damage of nuclear weapons and how many people died in history using them so that the public would know about their danger'.

In view of continuing tensions between India and Pakistan, it is important for the general population to have some understanding of nuclear deterrence. Political leaders and government ministers of both countries will make statements in the event of a crisis, which can add fuel to existing fires. In order to develop a regional nuclear security culture, broader awareness of ongoing issues and decision-making will be beneficial.

Conclusion: Drivers of Misperception

This report has sought to understand how Indian and Pakistani nuclear deterrence is communicated and understood by different actors in South Asia and the international community. In doing so, the authors focussed on language and communication, paying particular attention to drivers of misperception. Due to the enduring trust deficit between India and Pakistan, and the way in which nuclear deterrence is intertwined with domestic politics, it is difficult to objectively interpret statements related to intent. What is more, deterrence remains a field dominated by theory–in which personal, emotional nuances are sometimes under-analysed.

Intentions behind behaviour related to nuclear deterrence in South Asia are often opaque. This makes it challenging to clarify the meaning of actions such as tests or exercises, which could be potential signals. This is further complicated by the use of Cold War terminology and frameworks, which are not applicable to the South Asian context. The authors found that many key terms lack clear definitions and are not described in the same manner by different parties. There were also major conceptual differences in interpretation. For example, the idea of an 'arms race', perception of different kinds of technological advancements, as well as the role of China.

In this report, the authors illustrate how language reflects the emotional and political complexities that underpin security dynamics and dilemmas. Drivers of misperception include shared history of trauma, and conflict over the governance of Jammu and Kashmir – which have significantly affected communication. These factors combined have resulted in an inability to generate productive dialogue – which the authors have attributed in part to relative nature of language.

This is significant, because continuing competition and tension are increasing the potential for unintended escalation, including potential for miscalculation.

By studying government statements, existing literature, expert interviews, and public surveys the authors sought to produce an enhanced understanding of government intent, and insight into potential mitigating measures. The authors documented how regional deterrence is understood by both specialist and non-specialist audiences, paying particular attention to the ways in which they described security and related concepts. It was determined that language and translation can challenge or reinforce specialised knowledge. The authors found a lack of understanding of nuclear deterrence at a general level, adding further complexity to existing tensions: public attitudes have a notable impact on civil society engagement. The authors also encountered an absence of nuclear lexicon in important national languages such as Urdu and Hindi.

The existence of correctly defined, agreed and understood strategic lexicon falls short – particularly ideas such as Credible Minimum Deterrence (CMD). The authors want to underline that it is important to be aware of the role of strategic culture in the formulation and articulation of nuclear doctrine. Emphasis on theoretical constructs in analysing Indian and Pakistani nuclear doctrines has potentially distorted understandings of how both countries seek to employ their nuclear arsenals. Furthermore, escalation pathways and thresholds in the context of crisis-stability are not well-understood. Various local political movements, especially during election periods, have the ability to mobilise support for escalatory measures. This may result in 'commitment traps', where making steps towards de-escalation

could become virtually impossible due to prior linking of escalation with a domestic 'hard line'. This is all particularly significant to take into account when considering the advance of new technologies, which will certainly complicate perceptions and dialogue further.

The potential for miscommunication in times of crisis means that there is a dire need to fill the communication gap. For example, disagreement exists on whether there is a regional nuclear triad (China-India-Pakistan), or two dyads (China-India and India-Pakistan). Policies of both countries are misunderstood by the other, causing instability – and risk reduction measures are necessary to prevent future crises. However, nuclear issues are not the only topic on the security agenda in South Asia. While they can certainly be tied back into the nuclear deterrence debate, both 'Jammu and Kashmir' and terrorism, on their own, are seen as significantly greater cause for concern – not to mention economy and environment. As a result, Governments, Strategic Analysts, and the public are all having separate, parallel conversations about risk perception and trust building in Southern Asia.

Going forward, the authors recommend that information about nuclear deterrence in South Asia be re-oriented to generate more productive discussions. In particular, it could prove useful to utilise the framework of pedagogic discourse: consider the role of each party; understand how knowledge is created and accumulated; determine objectives and tasks, and how these will be initiated and followed-up on; and examine how meanings are made and applied. By connecting the language of deterrence to the reality of the environment in which it is used, it may be possible to break through the communication stalemate and to re-focus dialogue.

Appendix 1: The Language of Deterrence – Hindi & Urdu

Introduction

In Pakistan, which has a population of 216 million, 74 different languages are used. While some are endangered or dying, five of them have more than 10 million speakers: Urdu, Punjabi, Pashto, Sindhi and Saraiki. Urdu and English are Pakistan's official languages. It is estimated that almost half the population speaks English as a second language, and more than 100,000 people speak it as a first language. In India, with a population of almost 1.4 billion, 447 different languages can be found. Thirteen of them have more than 10 million speakers: Hindi, Bengali, Marathi, Telugu, Tamil, Gujarati, Kannada, Odia, Malayalam, Punjabi, Assamese, Maithili and, notably, Urdu. Here, too, more than half the population speaks English as a second language – and more than 250,000 people speak English as a first language. English came to the region many centuries ago, buts its use increased significantly when it became the official language of governance in the 19th century when the British crown ruled the subcontinent. Although the region gained independence from the United Kingdom in the middle of the 20th century, English remains the dominant language of administration and, crucially, security, in both Pakistan and India.

While Urdu and Hindi are by no means the only languages spoken in Pakistan and India, they have many things in common. Their joint origins in Hindustani and subsequent development have been subject to much debate and controversy. Although they are now written using Devanagari and a modified Perso-Arabic script, spoken they can be mutually intelligible. For this reason, in this study, both experts and the public were asked to describe key nuclear security terms not only in English, but also in Hindi and Urdu. This was then used to explore whether there might be any commonalities in word choice, which could lead to improving mutual understanding between Pakistan and India. What is more, this was also a way to 'crowd source' descriptions and translations, in order to counter any of the subconscious biases of the research team.[200]

Deterrence

When searching for 'deterrence' in an internet search engine the result is 'the action of discouraging an action or event through instilling doubt or fear of the consequences', which was presumably done by a few participants who had not heard the term previously. Excluding that vocabulary then, words that were chosen by both Pakistani and Indian participants were 'punishment', 'strategy', danger', and 'power'. In both languages, 'war' was mentioned more frequently than 'peace'. By people without a background in nuclear strategy and security, 'crime' was used several times as an example of something that should be stopped or prevented. Overall, this paints a mostly negative understanding of deterrence amongst the general public, but also a broadly similar understanding between participants from both Pakistan and India.

In Urdu, answers often included the words 'prevention' (روک تھا, rok thaam), 'stopping' (روکنا, rokna), 'discouraging' (حوصلہ شکنی, hosla shikni), 'threat' (دھمکی, dhamki) or 'possibility for danger' (خطرہ, khatra), 'war' (جنگ, jang), and 'weapons' (ہتھیار, hathyar).[201] Also mentioned more than once were 'crime, (جرم, jurm) or 'criminal activity' (مجرمانہ سرگرمی, mujrimana sargarmi) 'punishment' (سزا, saza), 'strategy' (حکمت عملی, himkmat amli), 'terrorism' (دہشت گردی, dehshat gard), 'resistance'(مزاحمت, muzahmat), 'obstacle' (رکاوٹ, rukawat), 'defence' or 'defend' (دفاع, difa'a), 'retaliation'

200 On narrative and framing see Mona Baker, 'Reframing Conflict in Transition,' Social Semiotics (2007).

201 Hindi and Urdu language answers were copied directly from the surveys, including spelling. Some answers were given in Perso-Arabic or Devanagari script, some in Romanised script. For example, shaanti (peace) was only recorded in Romanised script, not in Devanagari (शांति).

(جوابی کارروائی, jawabi kaarwai) and 'power' (طاقت, taaqat). One participant explained deterrence in the context of COVID-19.

In Hindi, answers most often included the words 'prevention' or 'restraint' (निवारण, nivaran) and 'discourage' (हतोत्साहित करना, hatotsaahit karane), as well as 'obstacle' (badha) and 'attack' (हमला, hamala), but also 'war' (युद्ध, yuddh), 'weapons' (हथियार, hathiyaar) and 'fear' or 'apprehension' (डर, dar). Other vocabulary that featured more than once included 'blockage' or 'barrier' (awrodh) 'threat' (आशंका, aashanka), 'power' (शक्ति, shakti), 'consequences' (परिणामों, parinaamon), 'doubt' (संदेह, sandeh), 'strategy' (only stated in English), 'wrong' (ग़लत, galat), 'crime' (aparaadh), 'cautious' (savdhaan), 'aggression' (आक्रामकता, aakraamakata) 'peace' (shaanti), 'harm' (नुकसान, nukasaan), 'danger' (खतरे की, khatare kee), and 'punishment' (saja). One participant called deterrence a 'social construct'. 'Terrorism' was not mentioned by anyone surveyed from India.

When the authors asked experts from India and Pakistan about deterrence (in English) 'nuclear' was included in almost every response. They brought up numbers of weapons, mobilisation, budgets, the development of new technology, China and the triad, conventional weapons, delivery systems, capability, range, demonstration of resolve, Cold Start, Cold War, and the Line of Control. They used words such as 'neutralise', 'last resort', 'crisis', 'signalling', 'distrust', 'strategy', 'politics', 'retaliation', 'pre-emptive strike' and also 'interpretation' and 'miscommunication' (Pakistan), as well as 'credibility', 'adversaries', 'flexibility', 'diversification', 'targets', 'unacceptable damage', 'accuracy', 'survivability', 'philosophy' and also 'cryptic' (India).

Confidence Building Measures

When the public was asked about confidence building measures in Urdu, they often referred to 'trust' (اعتماد, aitmaad), 'reduction' (کمی, kami), 'prevent' (روکنا, rokna), and 'tension' (تنائو, tanao). Other words which were used more than once were 'steps', 'hostilities' (دشمنی, dusmani), 'escalation' (اضافہ, izaafa), 'education' (تعلیم taleem), 'security' (تحفظ, tahafuz), 'cooperation' (تعاون, ta'aawun), and 'environment' (ماحول, maahol), or 'atmosphere' (ماحول, maahol). One respondent added 'such steps are needed to reduce tensions between Pakistan and India'. None of the respondents mentioned 'nuclear'. Several copied the answer from Google™: 'Confidence-building measures (CBMs) are planned measures to prevent hostilities, avoid escalation, reduce military tensions and build mutual trust between countries. These have been applied in all continents, only after the dawn of civilization. At the moment, very few military CBMs are in place'. Notably, several participants referred to self-esteem, relating the concept to themselves rather than geopolitics. For example, one respondent wrote 'we should introduce confidence building programs for the youth, our youth need confidence'.

The vocabulary used most often by respondents writing in Hindi was 'trust' (विश्वास, vishvaas), 'people' (लोग, log), 'mutual' (आपसी, aapasee), 'reduce' (कम करने, kam karna) and 'military' (सैन्य, sainy). Words which were also mentioned more than once were 'steps' (कदम, kadam), 'tension' (तनाव, tanaav), 'country' or 'nation' (desh), 'prevent' (निवारण, nivaran), 'improving' or 'increasing' (बढ़ने, badhane), 'peace' (shaanti), 'attack' (हमला, hamala), 'conflict' (sangharsh), and 'speech' (vani) or 'dialect' (boli). Similar to Pakistan, several participants referred to self-esteem, two copied the answer from Google™, and none mentioned 'nuclear'. One respondent wrote 'vaccination is a confidence building measure for covid' and another admitted 'I don't know about this'. However, more respondents seemed familiar with the concept, referring to social and political trust on a national level and the prevention of war. One participant wrote: 'Ways to increase confidence is the way through which we can suspend the possibility of war. This is seen in many countries of Europe, who, no matter how much they hate, still live together. It means that those conflicts are resolved not by killing, but by talking'. Another participant even used the acronym, writing 'very few military CBMs are in place'.

Experts referred to synonyms such as 'restore', 'normalise' and 'bring peace'. They also brought up military responses, nuclear tests, regional crises, cultural and emotional history between the two countries, pride, and involvement of

other parties such as the International Atomic Energy Agency. One pointed out there may be a 'CBM fatigue' at this stage. They talked about the interpretation of confidence building measures, and how this has changed over time. Several mentioned that India and Pakistan need to move away from entrenched positions in order for confidence building measures to be effective. They also spoke of them in relation to 'stability', 'negotiation', 'reassurance' and 'Kashmir' (experts from Pakistan), and 'exchange', 'balance' and 'terrorism' (experts from India). One expert added 'CBMs cannot be transactional; it becomes a negotiation; that does not demonstrate goodwill; they cannot come with strings attached' and another pessimistically added 'they are the first casualty of any crisis'. However, one expert said 'strategic scholars on both sides should continue to invest in thinking-outside-the-box ideas'.

Arms race

When the authors asked the general public to explain 'arms race', most Urdu answers included the words 'weapons' (ہتھیار, hathyar), 'competition' (مقابلہ, muqabla) and 'military' (فوجی, fauji). Other words that were used more than once were 'increase' (اضافہ, izaafa), 'superiority' (برتری, bartari), 'enemy' (دشمن, dushman), 'competitive' (مسابقتی, musabqati) or 'competing' (مقابلہ, muqabla), 'capability' (قابلیت, qabliyat), 'dominate' (غلبہ, ghalba), 'expenditure' (اخراجات, ikhrajaat) and 'money'(پیسہ, paisa), 'defense' (دفاع, difa'a), 'power' (طاقت, taaqat), 'dangerous' (خطرہ, khatra), 'accumulation' (جمع, jama'a) and also 'reduction' (کمی, kami).

When the authors asked about 'arms race' in Hindi, the majority of participants responded with answers that included 'weapons' (हथियार, hathiyaar), 'competition' (प्रतियोगिता, pratiyogita), 'powerful' (शक्तिशाली, shaktishaalee) and 'superiority' (श्रेष्ठता, shreshthata). Other words that were used more than once were 'military' (सैन्य, sainy), 'battle' (लड़ाई, ladaee), 'development' (विकास, vikaas), 'better' (बेहतर, behatar), 'nuclear' (नाभिकीय, naabhikeey), 'accumulate' (जमा, jama), 'technology' (praudyogikee) and strikingly 'Russia' or 'Soviet Union' (in English only).

The vocabulary used here is also quite similar between both countries. Notably, Pakistani respondents more often brought up financial and economic concerns, while several Indian respondents referred back to Russia and the Cold War. Strategic Analysts on the other hand focussed on numbers of warheads and delivery systems, quantities of weapon grade plutonium and highly enriched uranium, the history between India and Pakistan, broader security dynamics and strategic competition, misperceptions from Western literature, as well as China and the international community. In the expert interviews, many participants also referred to open-source estimates that suggest both countries are expanding their nuclear arsenals and the means of their delivery. They used words such as 'unacceptable damage', 'first strike', and 'credibility', (Pakistan), as well as 'capability', 'philosophy' and 'politics' (India). The Pakistani experts, like the public, did frequently bring up budget considerations as well. Notably, the Indian experts mostly emphasised that they believed there is no arms race in South Asia.

Massive retaliation

A term that is mentioned often in literature, and was used frequently by the interviewed experts, is 'massive retaliation'. However, its exact definition is not completely clear. When the authors asked the public to describe 'massive retaliation' in Urdu, they often used words such as 'attack' (حملہ, hamlaa) and in this case also 'nuclear' (جوہری, johri), as well as 'force' (طاقت, taaqat), 'revenge' and 'vengeance' (انتقام, intiqaam), 'strategy' (حکمت عملی, hikmat amli), and 'military' (فوجی, fauji). Other words which were mentioned more than once were 'enemy' (دشمن, dushman), 'ideological' (نظریاتی, nazriyati), 'doctrine' (نظریہ, nazriya), 'power' (طاقت, taaqat), 'counter' (جوابی, jawaabi) and, notably, 'deterrence'. 'Weapons' (ہتھیار, hathyar) were mentioned, but not often.

When the authors asked about massive retaliation in Hindi, answers also most often included the word 'attack' (हमला, hamala). 'Nuclear' (नाभिकीय, naabhikeey) featured as well, but not as often as in the Urdu results; while 'revenge' and 'vengeance' (प्रतिशोध, pratishodh) also appeared, but more often than in the Urdu results. Other words that were used more than once were 'enemy' (शत्रु, shatru),

'military' (सैन्य, sainy), 'strategy' (रणनीति, rananeeti), 'attack' (हमला, hamala), 'doctrine' (सिद्धांत, siddhaant), 'strike' (स्ट्राइक, straik), 'fight' (लड़ने, ladane), 'answer' or 'response' (जवाब, javaab), and 'government' (sarakar). The only country that was mentioned specifically by several respondents was 'Pakistan'. Like the Urdu results, 'weapons' (हथियार, hathiyaar) were mentioned, but not often. Notably, an obvious overlap in vocabulary between Hindi and Urdu are the words for 'attack' and 'weapon'.

When the authors asked experts to elaborate, they referred to the confusion of copying Cold War terminology, and the advantages of maintaining a certain flexibility in understanding. Some equated massive retaliation to 'unacceptable damage' – but likewise did not specify what this meant. They also brought up credibility, with one interviewee stating 'your adversary should know that you will be able to launch what you say you will, where you want it to go, it can't be that nobody takes it seriously'.

Surgical strike

Similar to 'massive retaliation', this is a term that is often used by 'Strategic Analysts, but not clearly explained. When the authors asked the general public about 'surgical strike' in Urdu, they responded with answers that included 'military' (فوجی, fauji) and 'army' (بری فوج, bar'ri fauj), 'target' (ہدف, hadaf) and 'damage' (نقصان, nuqsaan). Vocabulary that also occurred more than once was 'legitimate' (جائز, jaaiz), 'public' (عوام, awaam) and 'civilian' (سویلین, sibhialtaigh), 'collateral' (خودکش, khudkush), 'attack' (حملہ, hamla), 'harm' (نقصان, nuqsaan), 'sudden' (اچانک, achanak), 'bombing' (بمباری, bombari), 'purpose' (مقصد, maqsad), 'escalation' (اضافہ, izaafa), 'casualties' (ہلاکتیں, halaktein), and also 'suicidal' (خودکش, khudkush). 'India' was mentioned twice, but someone also used the US bombings in Iraq as an example. One participant specifically added that they thought it meant 'taking information about another country through drones and then attacking it'. More than one answer was a variation of 'A surgical strike is a military strike aimed solely at damaging a legitimate military target, with no more or less damage to surrounding structures, vehicles, buildings, or public infrastructure and facilities' – which is the result given when typing 'surgical strike' into Google™.

When the authors asked the same question in Hindi, responses most often included the word 'attack' (हमला, hamala), as well as 'military' or 'army' (सैन्य, sainy), 'enemy' (शत्रु, shatru), 'target' or 'goal' (लक्ष्यों, lakshyon) and 'harm' or 'detriment' (हानि, haani). Other words which occurred more than once were 'planning' (written in English) and 'predetermined' (पूर्व निर्धारित, poorv nirdhaarit), 'selected' (चुने हुए, chune hue) or 'precise' and 'specific' (vishisht), 'government' (सरकार, sarakaar), 'legitimate' (वैध, vaidh), 'strategy' (रणनीति, rananeeti), 'secret' (written in English), 'public' (saarvajanik), 'sudden' (अचानक, achaanak), 'minimum' (कम से कम, kam se kam), 'destroy' (नष्ट करने nasht karna), 'terror' and 'terrorist' (आतंक, aatank), and 'warning' (chetaavanee). Both 'missile' and 'drone' were also mentioned (in English). One respondent called surgical strike a 'mystery weapon'. Only one participant copied the answer from Google™, indicating that the Indian respondents were more comfortable writing about this term in Hindi than the Pakistani respondents writing about it in Urdu.

Strategic Analysts spoke about surgical strikes in the context of third parties, such as the United States, and regional politics. Several addressed it in relation to audience expectations and narrative construction. The rhetoric of retaliation was deemed more important than the definition of the action itself.

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