

Ballistic Missile Defence and Multiple Independently Targetable Re-entry Vehicles: Nuclear Deterrence in South Asia

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Abstract

In South Asian security dilemma by the development of Ballistic Missile Defence by India is threatening the credibility of Pakistan's nuclear deterrent. Consequently, to maintain deterrence stability and strategic balance, Pakistan under the guidelines of its policy of Full Spectrum Deterrence, has opted for Multiple Independently Targetable Reentry Vehicle (MIRV). Development of MIRV by Pakistan is cost-effective measure instead of developing its own BMD systems. Pakistan's development of MIRV in response to Indian BMD will create the offense-defense balance and enhance the nuclear deterrence in the region.

Keywords: Multiple Independently Targetable Reentry Vehicles (MIRV), Ballistic Missile Defence (BMD), Nuclear Deterrence, Minimum Credible Deterrence, Offense-Defense Balance

Introduction

South Asian region is famous for rivalry between two nuclear neighbors India and Pakistan reason being deep rooted mistrust, ongoing un-resolved disputes such as Kashmir, Siachen, Sir Creek issue, and Indus Watery Treaty. This has resulted in

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conventional/non-conventional military buildup by both states. After their overt nuclearization in May of 1998, both India and Pakistan have been involved in militarization including missile proliferation, conventional and naval build-up, which is intensifying arms race in the region. Though hostility between both states is unending but nuclear weapons have brought stability to a great extent. Since nuclearization, India and Pakistan have not ventured into all-out war because of the fear of unacceptable damages by nuclear armed adversary. According to Bernard Brodie deterrence “is a strategy intended to dissuade an adversary from taking an action not yet started or to prevent them from doing something that another state desires”. Thus, deterrence warns adversary not to take such an action that would invoke immediate response.

So, nuclearization has created deterrence stability in South Asia, which is consequential in prevention of an all-out war. Nuclear deterrence as a concept came forward during cold war. It relies upon the logic of benefit in not waging a war due to fear of unacceptable damage in response. Even though nuclear deterrence forbids adversaries to jump into conflicts, but maintaining it to minus the incentive for enemy to attack is quite an arduous task.

Often nuclear deterrence is taken as a hurdle by conflicting parties, as it deters them to destroy the enemy completely, which results in the constant attempts of defiance by one or all parties in the conflicting relations.

For India, it is not easy to accept that small adversary like Pakistan can become hurdle in its way of being a regional power. Overwhelming militarization – conventional and non-conventional – to amplify arms race in the South Asia by India is destabilizing deterrence equation in the region. Indian military build-up is directly proportional to its strategic ambitions of being a global

power. So, to achieve its hidden but evident ambitions of being a global power, India is continuously building up its nuclear facilities, increasing its stockpiles of missiles (sea and land based) and modernizing its conventional military. These all conventional and non-conventional military developments are done under swiftly changing doctrinal imperatives. Development of Inter-Continental Ballistic Missiles (ICBM) Agni V (land based), K4 and K 15 (Sea based) is representation of Indian hegemonic ambitions because these missiles cannot only be used against Pakistan but against other states as well.

So, India which aims to be a global player, never wanted its arsenals to be used as leverage. Hence, to acquire invincibility for its nuclear weapons and delivery vehicles in crisis, India is developing Ballistic Missile Defence to ensure survivability of Indian metros, nuclear silos and essential military installations; to reduce the credibility of enemy's attack that is trying to inflict the damage. As Ballistic missile defence have capability to destroy the incoming enemy missile in the air.

Therefore, to enforce credibility of its nuclear deterrent vis-à-vis India, Pakistan ventured into Multiple Independently Target Vehicle (MIRVs); as it is nearly impossible by BMD to destroy all the independently guided payloads. With this development Pakistan develop answer to Indian BMD that was questioning the credibility of Pakistan's nuclear deterrence. On the other hand nuclear deterrence is also a very dynamic concept that relies upon various factors to work effectively; it relies on nuclear doctrines and postures, developments in conventional and non-conventional military build-up, actions taken by export control regimes in International system.

In this research Pakistan's decision to acquire MIRV is seen under the prism of nuclear deterrence. Moreover, it is debated in

the paper that MIRV is by product of Indian Ballistic Missile Defence rather than a new trend in missile proliferation in the region. This paper is an attempt to extrapolate the impact of such arms build-up on the deterrence equation and strategic stability in South Asia. Even when development of MIRVs are considered as destabilizing move by international critiques, there is need to understand the security imperatives in which Pakistan took the decision.

Indian Ballistic Missile Defence (BMDs)

Theory of deterrence gain importance in Cold war after invent of nuclear technology. It denies the logic of war by Carl Von Clausewitz; war was no longer gain of political objective by other means because nuclear war is illogical mean to gain political gains. This theory presumes actors decide rationally and perform certain cost and benefit analysis before launching attack, so if cost and benefit analysis can be manipulated by one side, the other side would show restraint in launching an attack. Bernard William Kaufmann (1954), Henry Kissinger (1957) and Bernard Brodie (1959) are considered important advocates of deterrence. In words of Bernard Brodie “thus far the chief purpose of our military establishment has been to win the wars. From now on, its chief purpose must be to avert them. It can have almost no other useful purpose”.¹ Thus, deterrence ensures that state must not attack because cost of attack is more than benefits. Moreover it revolves around the fact that wars are unthinkable in nuclear environment.

Deterrence is “Ability to dissuade a state from embarking upon a course of action prejudicial to one's vital security interests/core values, based on a demonstrated capability”. According to this particular definition nuclear deterrence is a proficiency of state

¹Bernard Brodie, et al., *The Absolute Weapon: Atomic Power and World Power* (New York: Harcourt, Brace & Co., 1946), 76.

which is based upon its demonstrated capabilities to counter its enemies from attacking one's security and its vital interests. Thus, nuclear deterrence is not just to dissuade enemy from attacking physical boundaries but also stop it to harm one's core interest (economic, political and basic values). Another important aspect in this definition is "demonstrated capability," which means to uphold deterrence. It is necessary that state acquire credibility in delivery of its nuclear arsenals and communicate it to the enemy by actual display of its power. Although deterrence is a psychological effect yet it depends upon tangible factors for its validity. It cannot be upheld without capability, credibility of the capability and effective communication of one's capability to enemy. Deterrence is never static, it requires validation from certain variables; these variables include conventional capabilities of state, missile developments, space and cyber capabilities, submarine launched nuclear missiles, command-control systems and ballistic missile defence.² Moreover, development of new technologies play significant role in evolution of nuclear deterrence because they ignite action-reaction model. Nuclear Deterrence is established by a state through formulation of strong defence or through the threat of extreme retaliation/punishment,³ which means that deterrence can be of two types; offensive deterrence and defensive deterrence. Technological developments by state validate the fact that whether state is relying on offensive deterrence or defensive deterrence. In classic interpretations deterrence through denial is defensive deterrence and through retaliation is offensive deterrence and

²"21st Century Nuclear Deterrence and Missile Defence," *U.S. Department of Defense*, <https://www.defense.gov/News/Special-Reports/21st-Century-Nuclear-Deterrence-and-Missile-Defense/> (accessed July 12, 2018).

³Alexnadar.A. Ghionis, "Limits of Deterrence in Cyber World – An Analysis of Deterrence by Punishment," *Academia*, http://www.academia.edu/7464076/TheLimitsofDeterrence_in_the_Cyber_World_AnAnalysisofDeterrencebyPunishment (accessed July 12, 2018).

states rely on deterrence by retaliation until they develop better strategic defence.⁴

Since 1998, India is a declared nuclear weapon state, but history of its nuclearization can be traced back to 1974. Some of the scholars like Dhruva Shinkar debated that India is a reluctant nuclear state, which developed its nuclear program due to threats from China.⁵ However, empirical evidence goes against the claim that India is a reluctant nuclear state because India first tested its nuclear weapon under the guise of “peaceful explosion” in 1974 after extracting plutonium from spent fuel at CIRUS and its reprocessing at Trombay under the supervision of Homi Jehangir Bhabha⁶, which was an ambitious decision rather than reluctant initiative. Dr. Zafar Iqbal Cheem in his book mentioned that Indian nuclear program was conceived and designed by Bhabha in a manner that nuclear option was formed within the civilian structure of the Indian nuclear program, which enabled the expansion of weapon program along with the civilian program.⁷ This ambitiousness of Indian scientists and politician change the strategic and political discourse of South Asia. Moreover, it compelled Pakistan to acquire nuclear weapon as well under the guidelines of its security imperatives. So, it was Pakistan that could be considered as reluctant nuclear state not India. But, after 1974 test, it took India more than two decades to test its nuclear weapon

⁴Kim R. Holmes, “Basing Deterrence on Strategic Defense,” *The Heritage Foundation*, December 2, 1987, <https://www.heritage.org/defense/report/basing-deterrence-strategic-defense> (accessed August 01, 2018).

⁵Dhurva Jaishankar, “Decoding India’s Nuclear Status,” *The Wire*, April 03, 2017, <https://thewire.in/120800/decoding-india-nuclear-status/> (accessed August 02, 2018).

⁶Ibid.

⁷Zafar Iqbal Cheema, *Indian Nuclear Deterrence: Its evolution, development and Implications for South Asian Security* (Oxford University Press: Pakistan, 2010), 685-686.

overtly in 1998, which created a ripple effect in the region. Resultantly Pakistan tested its nuclear weapon in the same month of 1998 to acquire credible nuclear deterrence against India as well. Even before overt nuclearization of South Asia deterrence was used twice in crisis situation to avoid an all-out war; it was used in the Brasstack crisis of 1986-87 and in the Sprig crisis of 1990 over Kashmir. However, since 1998 nuclear deterrence is overtly practiced in South Asia. But as explained earlier that deterrence is never static and its volatility increases if importance of fear is denied or ignored by even one of the conflicting party through pursuit of offensive technologies, policies and doctrines.

In South Asia, Indian Ballistic Missile Defence Program challenged the prevalent deterrence equation by inducing false sense of security, under which India might be tempted to go for pre-emptive strike. As the false sense of security acquired through BMD systems will eliminate the fear of annihilation which forbids states to even consider a war in nuclear environment. Development of BMD systems by India is considered as a defensive move because they ensure deterrence by denial. However, amalgam of offensive deterrence and defensive deterrence in the back drop of technological developments requires careful analysis that whether certain technology is facilitating defensive deterrence or offensive deterrence.

Ideally the ballistic missile defence system should have the capability to detect, track, intercept and destroy the incoming missile during its three stages of flight i.e. boost, mid-course and terminal phase. Boost phase is the starting point where missile still hasn't exited the atmosphere or entered into outer space and is normally thrusting to gain velocity; this phase lasts only for 1 to 5

mints depending upon the range of missile.⁸ During Midcourse phase missile shed its rocket motors and begin coasting or freefalling towards its target⁹. It is relatively easier to intercept missile in midcourse phase because in this phase missile is no longer under power and it follows predictable path; moreover, there is more time window in this phase to intercept and target. Terminal phase is the last phase and in it missile reenters in to the earth atmosphere and it lasts less than 1 minute. Thus, because of limited time to engagement it is harder to target enemy missile in this phase. The ballistic missile defenses are deployable at land, sea and space

Indian Ballistic Missile defence program is rooted back to 1983 when Integrated Guided Missile Development Program (IGMDP) was initiated.¹⁰ Development of missiles like Agni and Prithvi are the efforts of IGMDP. Moreover, under this program India developed offensive missiles like Akash (Surface to Air) for air defence with capability of being converting in to Theatre Missile Defence (TMD) as well.¹¹ Later, in coming decades India went ahead with the idea of missile defence systems¹² and developed the capability that could intercept missiles not only in endo-

⁸“Ballistic Missile Defence Challenge,” *Missile Defence Agency: MDA Facts, Nuclear Threat Initiative*, <https://www.nti.org/media/pdfs/105.pdf> (accessed August 1, 2018).

⁹“Three Stages of the Intercontinental ballistic missile (ICBM) Flight,” *Pathfinder*, no. 305 (March 2008), <http://airpower.airforce.gov.au/APDC/mediaFiles/Pathfinder/PF305-Three-Stages-of-the-Inter-Continental-Ballistic-Missile> (accessed August 2, 2018).

¹⁰Frank O’ Donnell and Yogesh Joshi, “Indian Missile Defense: Is the game worth the candle,” *The Diplomat*, August 2, 2013, <https://thedi diplomat.com/2013/08/indias-missile-defense-is-the-game-worth-the-candle/> (accessed August 2, 2018).

¹¹Ibid.

¹²Zafar Nawaz Jaspal, “The Introduction of Ballistic Missile Defense in South Asia: Implications on Strategic Stability,” *Nuclear Learning: the next decade in South Asia*, (2013), <https://www.nps.edu/documents/104111744/106151936/.11+Nuclear+Learning+Jaspal> (accessed August 3, 2018).

atmosphere but also in exo-atmosphere. At start Indian ballistic missile defence faced quite a back lash due to lack of technological capacity and strict non-proliferation measures in international community.

However, as ties between US and India grew, Indian access to sophisticated technology increased tremendously. Two sectors of Indian military that benefited the most from the Indo-US partnership are Indian ballistic missile program and Indian Space program; for instance Glide Path Agreement signed on 19 December 2003 is enabling India in space, nuclear and missile defence fields. Before that, in 2002 India was also invited by US to attend a BMD Workshop in Colorado.¹³

Currently, Indian Ballistic Missile defence system is a two layered system based on Prithvi Air Defence (PAD) and Advance Air Defence (AAD).¹⁴ On February 17, 2017 India successfully tested its indigenous Ballistic Missile defence system on Abdul Kalam Island, in the Bay of Bengal.¹⁵ With this test India successfully converted its Prithvi Air Defence in to Prithvi Air Vehicle (PAV). Prithvi Air Defence with its Pradyumna ballistic missile interceptor has a maximum interception altitude of 80 km¹⁶; now PAD is replaced with PAV whose minimum interception altitude is 50 km and is

¹³Zafar Iqbal Cheema, *Indian Nuclear Deterrence: Its evolution, Development and Implications for South Asian Security* (Oxford University Press: Pakistan, 2010), 67-76.

¹⁴Asma Khalid, "Implications of BMD, MIRV tech in South Asia," *Pakistan Observer*, May 9, 2017, <https://pakobserver.net/implications-bmd-mirv-tech-s-asia/> (accessed August 05, 2018).

¹⁵Franz-Stefan Gady, "India Successfully Tests Prithvi Defense Vehicle, A New Missile Killer System," *The Diplomat*, February 15, 2017, <https://thediplomat.com/2017/02/india-successfully-tests-prithvi-defense-vehicle-a-new-missile-killer-system/> (accessed August 05, 2018).

¹⁶Ibid.

capable to engage targets in exo-atmosphere.¹⁷ Moreover, it is stated that (PAV is capable of Infrared Imaging to distinguish between warheads and decoys, other than that, PAVs are capable of mid-course interception of incoming enemy missiles.¹⁸ In multilayered Indian Ballistic Missile system Advance Air Defence is for intercepting missiles in endo-atmospheric region at altitude of 15-40 km in the terminal phase, when missile enters into the atmosphere of the earth.¹⁹ Advance Air Defence is capable of maneuvering at low altitudes, it has 3D thrust vectoring capability that allows it to turn into any direction swiftly and it has single stage solid fueled missile.²⁰ So, in theory Indian two layered Anti-Ballistic Missile defence are capable of stopping not only strategic nuclear delivery vehicles but tactical delivery vehicles as well.

It is claimed by India that its capabilities in hardware of ballistic missile defences are indigenous but in reality Russia, US and Israel are biggest contributor in the ballistic missile defence technology.²¹ India has signed an agreement of \$ 5.43 billion to buy S-400 anti-

¹⁷ Hemant Kumar Rout, "What makes Prithvi missile interceptor one of the best in the world: Here are 10 reasons," *Indian Express*, February 11, 2017, <http://www.newindianexpress.com/nation/2017/feb/11/what-makes-prithvi-missile-interceptor-one-of-the-best-in-the-world-here-are-10-reasons-1569593--1.html> (accessed August 05, 2018).

¹⁸ Ibid.

¹⁹ Franz-Stefan Gady, "India Successfully Tests Prithvi Defense Vehicle, A New Missile Killer System," *The Diplomat*, February 15, 2017, <http://thediplomat.com/2017/02/india-successfully-tests-prithvi-defense-vehicle-a-new-missile-killer-system/> (accessed August 05, 2018).

²⁰ "India's Ballistic Missile Defence Shield: A Strategic Analysis," <http://fullafterburnerweebly.com/aerospace/indias-ballistic-missile-defence-shield-a-strategic-analysis> (accessed August 6, 2018).

²¹ Frank O' Donnell and Yogesh Joshi, "Indian Missile Defense: Is the game worth the candle," *The Diplomat*, August 02, 2013, <https://thediplomat.com/2013/08/indias-missile-defense-is-the-game-worth-the-candle/> (accessed August 06, 2018).

missile system from Russia and with collaboration of Israel developed long range, phased array radars.²²

S-400 is considered as best available missile system in market due to its ability to engage not only ballistic missiles, but also UAVs, fighter planes and cruise missiles through surface to air attack missiles. It is also capable of intercepting and destroying multiple airborne targets at distance up to 400 km (250 miles).²³ S-400 missile systems have the capability to fire four different types of missiles, which include very long range missiles, long range missiles and short range missiles and 9M9E62 missile; that can fly at the speed of 5 Mach and can engage targets at 5 meters above the ground.²⁴ Furthermore due to its optional acquisition radars enable it to defeat modern stealth aircrafts such as F-22 and F-35.

Other than US, Israel and Russian, French also assisted India in development of guidance radars for Indian Ballistic missile systems. Acquisition of these sophisticated missiles by India for making its Ballistic missile defence operational is declared as defensive move. India claims that primary reason behind BMD development is to deter threats arising from two fronts China and Pakistan.

However, Indian logic of declaring BMDs as defensive deterrent could be tested based on repercussions it will have on the strategic stability of South Asia. In any arms race BMDs are considered as highly destabilizing factors as they eliminate the fear and give false

²²Ibid.

²³Vivek Raghuvanshi, "India approves S-400 buy from Russia, amid expectations for more bilateral deals," *Defense News*, September 28, 2018, <https://www.defensenews.com/land/2018/09/28/india-approves-s-400-buy-from-russia-amid-expectations-for-more-bilateral-deals/> (accessed August 06, 2018).

²⁴Stephen Bryen, "Russia's S-400 Is Way More Dangerous than You Think," *The National Interest*, January 18, 2018, <https://nationalinterest.org/blog/the-buzz/russias-s-400-way-more-dangerous-you-think-241116> (accessed August 6, 2018).

sense of security these systems are yet unable to achieve 100% success rate.²⁵

Furthermore, nuclear deterrence allows state to respect shared risk of war to avoid total destruction. But, with development of BMDs, India is trying to supersede shared risk of destruction by rising above it. In other words, India is inviting other states to develop systems, which could breach ballistic missile defenses, to maintain deterrence by arms race. Proponents for Ballistic Missile Defence recognize it as defensive technology, acquired to enhance defensive deterrence of a state.²⁶ However, point to ponder in this regard is technology such as BMD could not be declared as defensive deterrent as they are the attempt to rise above the deterrence by eliminating the mutual vulnerability. Furthermore, technologies are seen under the microscope of intentions of states and their policies. So far, India is aspiring to be a global power, for achieving this status it is convinced that it requires maximization of hard power and BMD is a tool in maximization of power.²⁷ As BMDs will provide invincibility to nuclear arsenals and key civil and military installations, more aggressive and risk taking behavior on the expense of other state's vital interest could be expected in coming years from India. Thus, considering Indian intention of

²⁵"Ballistic and Cruise Missile Capabilities and Deterrence Equilibrium in South Asia", 2018, *SVI In-house Report, Strategic Vision Institute, Ballistic and Cruise Missile Capabilities and Deterrence Equilibrium in South Asia*" (accessed date August 10, 2018).

²⁶Balraj Nagal, "India and Ballistic Missile Defense: Furthering a Defensive Deterrent," *Carnegie Endowment for International Peace*, June 30, 2016, <http://carnegieendowment.org/2016/06/30/india-and-ballistic-missile-defense-furthering-defensive-deterrent-pub-63966> (accessed August 10, 2018).

²⁷Zafar Nawaz Jaspal, "The Introduction of Ballistic Missile Defense in South Asia: Implications on Strategic Stability," *Nuclear Learning: the next decade in South Asia*, 2012, https://www.nps.edu/documents/Nuclear+Learning_Jaspal (accessed August 10, 2018).

being a global power, BMDs is more of a power maximization move.

India claims that its ballistic missile defence systems are to strengthen its defence against two front nuclear threats from Pakistan and China. Indian policy makers staunchly believes that due to technological advancements in both of its littoral rival states, security gap between India and its adversarial states will increase, thus BMDs will play pivotal role in narrowing the gap.²⁸

Such developments by India are not defensive maneuvers as even without BMDs India was deterring Pakistan and China effectively. According to former Indian Strategic Commander, development of ballistic missile defence by India was an attempt to protect not only its Metros but also its command and control system and increase credibility of its command system by denial to the adversary.²⁹ Thus, India's intention with BMD systems was to gain advantage against nuclear adversary by eliminating the notion of mutual destruction. However, India yet has not been able to deploy its BMD systems and Indian Ministry of Defence has demanded early induction of ballistic missile defence system from Defence Research and Development Organization.³⁰

²⁸Balraj Nagal, "India and Ballistic Missile Defense: Furthering a Defensive Deterrent," *Carnegie Endowment for International Peace*, June 30, 2016, <http://carnegieendowment.org/2016/06/30/india-and-ballistic-missile-defense-furthering-defensive-deterrent-pub-63966> (accessed August 10, 2018).

²⁹B. S. Nagal, "Perception and Reality: An In-Depth Analysis of India's Credible Minimum Deterrent Doctrine," *Force*, October 10, 2014, <http://www.forceindia.net/PerceptionandReality.aspx> (accessed August 10, 2018).

³⁰Vivek Rahuvenshi, "India's MoD demands early induction of ballistic missile defense system," *Defence News*, May 18, 2017, <https://www.defensenews.com/land/2017/05/18/india-s-mod-demands-early-induction-of-ballistic-missile-defense-system/> (accessed August 11, 2018).

Impact of BMDs on South Asian Nuclear Deterrence

Although Pakistan does not have official published nuclear doctrine document, but it is following certain guiding principles as an attempt to decrease ambiguity in the strategic environment of South Asia. Absence of any guiding principle for use of nuclear force leaves enemy in conundrum that how adversary will use its force. Pakistan follows certain level of ambiguity in its nuclear doctrine not to limitize its options. However, to understand Pakistan's nuclear policy one has to look into the statements made by its National Command Authority.³¹

In 2013 National Command Authority (NCA) signaled that Pakistan would follow the policy of full spectrum deterrence, which was later confirmed again at 23rd meeting of NCA and in statement by Lt. Gen. Khalid Kidwai who is Advisor to National Command Authority.

Recent investments (short range ballistic missile, sea launched cruise missiles and multiple independently re-entry targetable vehicle) made by Pakistan in strengthening its deterrence against India suggests Pakistan's shift towards more complex Full Spectrum Deterrence posture. However, even when India's strategic policies and doctrines are challenging the existing status quo in the region biggest guiding principle of Pakistan's nuclear posture is Minimum Credible Deterrence. Moreover, in selection of its nuclear posture, Pakistan opted for war denying deterrence rather than war fighting deterrence vis-à-vis India to avoid arms race and nuclear competition in the region.³² Adoption of minimum credible deterrence by Pakistan was pragmatic decision based on limited

³¹Hassan Ehtisham "Pakistan's Evolving Nuclear Doctrine," *Express Tribune*, January 09, 2018, <https://tribune.com.pk/story/1603554/6-pakistans-evolving-nuclear-doctrine/> (accessed August 12, 2018).

³²Khalid Iqbal, "India and Pakistan's Nuclear Doctrines and Posture: A Comparative Analysis," *Criterion-Quarterly* 11, no. 2 (September 9, 2016).

available resources owing to the small economy and threat perception of Pakistan. In South Asian threat landscape, Pakistan's security concerns revolve around threats from India, which are based upon the wars, ongoing conflicts, historic experiences, border skirmishes, offensive statements and policies from statesmen.

Indian covert nuclearization added fuel to the burning South Asian security and threat matrix; moreover, it brought nuclear arms race in the region, consequently led Pakistan to its own nuclear weapon program. Therefore, in development of its nuclear use policy India is the only country against whom Pakistani nuclear weapons are directed. Till, 2004 official documents of National Command and Control authority of Pakistan emphasized on the development of its nuclear forces according to "minimum deterrence needs".³³ But after Indian infatuation with Cold Start Doctrine, Pakistan resorted to miniaturization of its nuclear arsenals by making low yield, short range weapon (Nasr). Development of Nasr was Pakistan's response to deter Indian attempts of war at lower tiers in wake of operationalization of its pre-emptive limited war doctrine. With shift from Sundarji Doctrine to Cold Start Doctrine, India shifted its conventional military strategy from defensive to offensive. Thus, after achieving so called security for its nuclear silos, delivery vehicles, military installations and cities under BMD system India was shifting towards offensive conventional war fighting doctrines.

Hence, in this backdrop of Indian developments of Indian nuclear arsenals and in its conventional doctrines Pakistan realized the need to develop and communicate few other aspects of its

³³"Musharraf rules out arms race," *Dawn*, September 25, 2002, <http://www.dawn.com/news/58829/musharraf-rules-out-arms-race> (accessed August 12, 2018).

nuclear deterrence to the adversary. Thus, Pakistan's nuclear posture adopted another feature which is, Full Spectrum Deterrence to communicate it to India that its strategic deterrence is dynamic enough to counter threats emerging at all spectrums of conflict

Development of Low Yield Weapons

Due to low yield weaponization and full spectrum deterrence Pakistan faced a lot of criticism, it was argued that Pakistan is attempting to lower the nuclear threshold and is going for battle field nuclearization.³⁴ On the other hand, Pakistan is merely trying to maintain credibility of its minimum deterrence. Pakistan's policy of full spectrum is in line with its initial policy of credible minimum deterrence.³⁵ Moreover, full spectrum deterrence policy by Pakistan is not an attempt to take nuclear weapons to the battle field but rather developing different options for a full spectrum of targets.³⁶

After development of ballistic missile defence by India, Pakistan's deterrence posture required reinforcement of element of credibility. Consequently to maintain credibility in its deterrence posture Pakistan chose to go for countermeasure against rising threat from BMDs. In selection of its options against BMDs Pakistan's decision has to be in accordance with its economic limitations.

³⁴Sajid Farid Shapoo, "The Dangers of Pakistan's Tactical Nuclear Weapons," *The Diplomat*, February 01, 2017, <https://thediplomat.com/2017/02/the-dangers-of-pakistans-tactical-nuclear-weapons/> (accessed August 14, 2018).

³⁵No PR-615/2017-ISPR, Press Release, December 12, 2017, https://www.ispr.gov.pk/front/main.asp?o=tpress_release&cat=army&date=2017/12/21 (accessed August 15, 2018).

³⁶"Rare light shone on full spectrum deterrence policy," *Dawn*, December 07, 2017, <https://www.dawn.com/news/1375079> (accessed August 16, 2018).

Developing a Ballistic missile system of its own was out of question for Pakistan, as it is not only an expensive technology but its effectiveness is still challengeable. As missile defence systems does not have the capability to intercept and destroy all the incoming missiles. For instance Iron Dome defense shield by Israel is highly acknowledged for its effectiveness in 2012-2014 but even it has the failure rate of 10-15%.³⁷ Moreover, in 2009 during the height of Korean missile threat, there Defense Secretary told the Congress that missile defense systems are fully adequate to protect us against a threat from North Korea but the Chairman of Joint Chiefs of Staff told senate committee that he would assess the effectiveness of missile systems as 90 %³⁸. These analysis shows that it is hard to achieve 100% success rate with ballistic missile defence shields and on the top of technological difficulty it is also very expensive technology.

Counter Measure by Pakistan: Multiple Independently Re-entry Target Vehicle (MIRV)

As a consequence of Indian indulgence in ballistic missile defence, naval nuclearization and space militarization; strategic competition between both countries reaches new heights. Unfortunately, in ongoing strategic competition India being a larger economy and more resources to its disposal is leading the arms race and choosing diverse arenas of competition.

Development of Ballistic Missile Defence in South Asia is also one such attempt in which “war avoidance deterrence” is challenged and arms race is ignited by undermining the notions of deterrence equilibrium. Thus, Pakistan was forced to look for more

³⁷George N. Lewis, “Ballistic Missile Defence Effectiveness,” *American Institute of Physics*, (2017), <https://aip.scitation.org/doi/pdf/10.1063/1.5009222> (accessed February 11, 2019).

³⁸ibid.

options to enhance credibility and survivability of its deterrent against BMD of its adversary in South Asia. Unlike BMDs the cost effective option opted by Pakistan was Multiple Independently Targetable Reentry Vehicle.

Year 2017 was fruitful for Pakistan regarding development of survivability and credibility of its strategic weapons vis-à-vis India. As, in this year Pakistan developed not only a MIRV but also acquired second strike capability through the development of nuclear tipped cruise missile Babur 3 launched from a submarine. These developments were necessary considering growing nuclear threats from India. First multiple independent re-entry target vehicle (MIRV), named “Ababeel”, was tested by Pakistan in month of January 2017 with range of 2200 km and ability to carry nuclear and conventional warhead.

During Bi-polarity when both of the super powers (USA – former USSR) had almost equal missile launchers, issue of losing strategic force faster than enemy in attacking first was raised as an alarming concern. Answer of such dilemma was resolved by the development of Multiple Independent Re-entry Target Vehicle by USA and USSR.³⁹ MIRVs developed by both superpowers were not only capable of carrying more than one missile but these missiles have high accuracy and high yield. Increased accuracy and high yield of MIRVs made them ideal candidate for using in pre-emptive strike against enemy. Moreover, MIRVs if used in pre-emptive strike could also be used to hit hardened targets of enemy to decrease its potential for massive retaliation.

³⁹Brendan Rittenhouse Green and Austin Long, “The Geopolitical Origins of US Hard-Target-Kill Counterforce Capabilities and MIRVs,” *Stimson Center*, June 28, 2016, <https://www.stimson.org/content/geopolitical-origins-us-hard-target-kill-counterforce-capabilities-and-mirvs> (accessed February 11, 2019).

MIRV technology enables missile to carry more than one warhead in single launch and with the capability to hit multiple individual targets. MIRVing is a complex technology and required a lot of technological specifications regarding missile accuracy, miniaturization of warheads and increase in yield of weapon. In MIRVs main rocket motor pushes compartment that contains warhead in suborbital ballistic flight path, at the boost phase, warhead compartment maneuvers utilizing an inertial gravitational system to maintain accuracy and release warhead on board by maneuvering repeatedly.⁴⁰This process is repeated till all the warheads are released.

So, MIRV was selected by super power like USA because of its cost effectiveness, high accuracy, high yields and its ability to not lose strategic assets faster than enemy. Development of MIRVs in South Asia is categorized as the second coming of MIRVs.⁴¹ Though MIRV technology is difficult to acquire yet Pakistan has achieved it because of its experience in miniaturization of missile weapon.

Pakistan tested its MIRV to make nuclear deterrence work in South Asia by keeping options open for itself at all spectrums of threat. By acquiring MIRV Pakistan became 7th country that has MIRV technology⁴²; USA, Russia, UK, France, Israel and China are the declared states with MIRVs technology. As MIRVs are regarded as complex technologies, they send more than one warhead in

⁴⁰Ali Osman, "What you need to know about Pakistan's Ababeel ballistic missile," *Dawn*, January 25, 2017, <https://www.dawn.com/news/1310463> (accessed August 15, 2018).

⁴¹Sameer Lalwani and Travis Wheeler, "The second coming of MIRVs: the future of strategic arms competition," *War on the Rocks*, August 23, 2016, <https://warontherocks.com/2016/08/the-second-coming-of-mirvs-the-future-of-strategic-arms-competition/> (accessed August 12, 2018).

⁴²Ali Osman, "What you need to know about Pakistan's Ababeel ballistic missile," *Dawn*, January 25, 2017, <https://www.dawn.com/news/1310463> (accessed August 12, 2018).

single launch and that too with high accuracy.⁴³ To achieve high accuracy for Ababeel, Pakistan also bought optical missile tracking system from China, which will track record different missiles in different directions in a MIRV through high-resolution images of a missile's departure from its launcher, stage separation, tail flame and after the missile re-enters earth atmosphere, the trajectory of the warheads it releases.⁴⁴ However, what makes this system unique is its ability to detect missile up to range of several hundred kilometers through the help of its telescopes, which are equipped with laser ranger, high-speed camera, infrared detector and a centralized computer system that automatically captures and follows moving targets.⁴⁵

Other than before mentioned seven states, it is considered that India is also capable of MIRVing.⁴⁶ With the development of Agni V and heavy lifting of satellite capabilities it is signified that India has developed basis for ICBM and MIRVs.⁴⁷ Moreover, international scholars are also of view that India would acquire MIRV technology

⁴³Ahyousha Khan, "Optical Missile Tracking Systems and Minimum Credible Deterrence," *Eurasia Review*, April 13, 2018, <https://eurasia.eu/2018/.../12/optical-missile-tracking-systems-and-minimu> (accessed August 12, 2018).

⁴⁴"China provides 'high-performance tracking system' for Pakistan's missile programme," *Express Tribune*, March 22, 2018, <https://tribune.com.pk/story/1666541/9-china-provides-high-performance-tracking-system-pakistans-missile-programme/> (accessed August 16, 2018).

⁴⁵Ibid.

⁴⁶Ali Osman, "What you need to know about Pakistan's Ababeel ballistic missile," *Dawn*, January 25, 2017, <https://www.dawn.com/news/1310463> (accessed August 17, 2018).

⁴⁷"India's Quest for MIRV Technology-Analysis," *Indian Defense News*, January 3, 2015, <http://www.indiandefensenews.in/2015/01/indias-quest-for-mirv-technology.html> (accessed August 18, 2018).

not only in its land based ICBM but also at Sea launched Ballistic Missiles depending on the success at miniaturization of warheads.⁴⁸

This particular development has also increased the threat calculus for Pakistan. Pakistan didn't want to become victim of Indian combination of MIRVing and BMD. Any state if it has both BMD and MIRV will turn strategic pendulum in its favor as its ballistic missile defence will guard its strategic assets and MIRVs will have capacity to destroy enemy's strategic assets. In the wake of all these developments induction of MIRV by Pakistan in its strategic forces was to maintain balance.

Pakistan's induction of Ababeel in its strategic forces was necessary considering Indian efforts to shift strategic pendulum in its favor. Moreover, Indian technological developments suggest that India is opting for counter force posture and its "no first use policy" is nothing but a façade. International scholars like Vipin Narang are of view that Indian nuclear force posture is under change; in the retrospect of India National Security Advisor's book, in which, it is claimed that in case of war and crisis India might not let Pakistan to go first. Chances are rather than using conventional strike against Nasr batteries, India might launch "comprehensive counter force strike" against Pakistan.⁴⁹ This observation regarding India's changing force posture has acclaimed huge international audience but for Pakistani policy makers it was not such a surprise because of the skepticism towards Indian "No first use" policy.

⁴⁸Mansoor Ahmad and Feroz Hassan, "Pakistan, MIRVs, and Counterforce Targeting, *Stimson Center*, 2016, <https://www.stimson.org/content> (February 11, 2019).

⁴⁹Asma Khalid, "India's Nuclear Strategy: A shift to Counterforce," *South Asia Journal*, December 28, 2017, <http://southasiajournal.net/indias-nuclear-strategy-a-shift-to-counterforce/> (accessed August 18, 2018).

In a scenario where India is gradually but steadily moving towards MIRV technology, ICBMs, ballistic missile defence and secret doctrinal shifts, pragmatic decision to maintain deterrence cannot be categorized as offensive measures. For Pakistan, sole purpose to acquire nuclear weapon was not to be a global power but rather to deter India from waging war.

However, acquisition of MIRVs by Pakistan has amassed greater attention from international scholars. This step by Pakistan is criticized in international community as it will complicate the uncertain strategic environment of South Asia. It is perceived that MIRV technology with its high accuracy and high yield is an ideal choice to use at the start of nuclear war to inflict massive damage and make first strike a decisive blow. So, in the aftermath of attack enemy doesn't have sufficient reserves to launch massive retaliation. Thus, international community is of view that with selection of MIRV Pakistan is opting for counterforce targeting and inviting India to use its weapon first because of "use it or lose it" option.

Nevertheless International community due to its economic interests vested in larger Indian markets is undermining the logic of strategic stability and nuclear deterrence in the region. South Asian strategic stability is a constant see saw where Indian side is heavier and by using its nuclear deterrence Pakistan is merely trying to balance. By developing MIRV, strategic stability in South Asia will strengthen by offense-defense balance. MIRV is an ideal counter force technology but Pakistan developed it to enhance its defensive capacity against India. Pakistan's reliance on war denying deterrence is the reason behind acquisition of MIRV technology, which will ensure the validity of shared risk of destruction between India and Pakistan.

MIRVs enable Pakistan to send its nuclear delivery vehicle without becoming victim to interceptor missiles. As MIRVs carry more than one warhead it is impossible for interceptors to detect all missiles in one independently guided missile. With MIRVs more area can be covered and more destruction could be inflicted to enemy in single attack. As Pakistan face wide array of threats from India, in case of conventional attack from India, Pakistan could use nuclear weapon as a last resort. Before advent of MIRV, Pakistan was relying on its low yield weapon against India to deter its conventional attack. But, now Pakistan has option to go for Indian military installations, cities and command structures in single strike, if Pakistan's physical boundaries, its economic or military interests are compromised by Indian attack.

Conclusion

The preceding discussion reveals that Pakistan has been developing MIRVs capability, which would be added into Pakistan's operational missile inventory to ensure the credibility of its deterrence vis-à-vis India. Indian BMDs, its ghost MIRVing capabilities and its shift to counter force posture were issues of serious concern that Pakistan planned to resolve by developing and deploying Ababeel. No doubt, MIRV is a technology that fits more to the logic of offensive deterrence posture but yet it is intentions of a state that define that whether they want to use it for offensive measures or defensive measures.

So far, Pakistan is relying on defensive measures and will use its MIRV capability, if India tries to wage a war. Moreover, acquisition of MIRV by Pakistan will increase the deterrence stability in the region through offense-defense balance between India and Pakistan. Lastly, development of Ababeel was not to give rise to arms race in the region rather it was reaction of actions taken by India. In a situation where one party is relying on nuclear

deterrence to counter its enemy, technological innovations become necessity to ensure credibility to deterrent.