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# BALLISTIC MISSILE DEFENCE SYSTEM AND ITS IMPLICATIONS FOR STRATEGIC STABILITY IN SOUTH ASIA: A CASE STUDY OF INDIA

**Abstract**

The technological evolution and proliferation of ballistic missile defence (BMD) systems in the last two decades have ushered in the beginning of a new wave of strategic concern amongst security experts. The BMD attempts to unbalance the global strategic stability primarily founded on the strategy of nuclear retaliation. President George W. Bush administration further aggravated this threat to the global security order when he unilaterally withdrew the support of the United States (US) from the Anti-Ballistic Missile (ABM) Treaty. The approach of the US to strengthen its defence system has pushed other states to either pursue their own costly BMD system or reassure themselves through some new offensive strategies such as increasing number of nuclear arsenals. South Asia has not remained untouched from these global developments. In recent years, this region has witnessed a rapid proliferation of defensive and offensive ballistic missiles. This article aims to analyse the functioning of BMD system and its causal relation to the nuclear deterrence. In the context of South Asia, it seeks to explore the triangular strategic relationship among India, China and Pakistan within the broader framework of their BMD system.

## 1. Introduction

The global security order has been transforming with the development of BMD system. On one hand, whereas many strategic analysts have argued, a change in strategic forces where defence would dominate security policy could lead to a more secure nuclear world; on the other, opponents of missile defence have argued that the spread of ballistic missiles technology would not only revive the Cold War rivalry of old superpowers but also garner severe new tensions among regional nuclear powers. The issue has caused considerable concern for India, as it faces a serious security threat from its neighbourhood, i.e., China and Pakistan with whom it has a long history of military confrontation. Over the last two decades, China has increased its missile defence capability enormously and successfully carried out a series of missile tests. On 11 January 2010, China surprised the world by conducting the first test of a ground-based missile interceptor.[1] Two years later on 11 January 2013, China again tested the feasibility of its ground-based missile interceptor and successfully demonstrated

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[1] Department of Defense, *Military and Security Developments Involving the People's Republic of China 2015,* Washington D. C.: Department of Defense, United States of America, 2015.

the efficacy of its missile interceptor to destroy the incoming missile.[2] The Chinese approach to strengthening its defence system has pushed New Delhi to pursue its own costly missile defence system. On 01 March 2017, New Delhi successfully launched an Advanced Area Defence (AAD) missile as a response to Beijing's ground-based missile interceptor test.[3] This action-reaction dynamic between the two rising Asian powers has heightened tensions on several occasions. Earlier this year, China expressed its deep dissatisfaction over India's test firing of Agni-V missile on 26 December 2016. Even to some experts, New Delhi has taken this step to counter China. However, the Indian security concern is largely tailored at more to Pakistan's missile programmes rather than China's. For many Indian strategic analysts, the threat of a nuclear war has severely constrained New Delhi's potential to deter Pakistan sponsored terrorist activities and low intensity war in Kashmir.[4] In such a security structure, strengthening India's missile defence capability has been viewed by many as the only means to deter Pakistan's aggressiveness. However, there exists a widespread disagreement amongst scholars and security experts with regard to the role of BMD. Many strategic experts have argued that missile developments in South Asia would unnecessarily increase proliferation concerns in the region and would severely damage its strategic stability.

This article attempts to analyse both positive and negative aspects of missile developments in South Asia and its broader implications for regional security. In particular, it focuses on India and China's missile defence programmes. Examining competition between the two rising Asian powers in the development of missile defence system provides quite a unique approach to the existing literature of BMD. Since BMD literatures are traditionally dominated by the US and the Union of Soviet Socialist Republic (USSR)/Russia rivalries, relatively little analysis of other countries exists. While a number of books, journal and newspaper articles have been published since the advocacy of ballistic missile in 1944, a few scholars such as Aaron Karp, Rajesh Rajagopalan, Columba Peoples, Nik Hynek and Andrew Futter have been engaged at best with the concept of missile defence and international security.

Aaron Karp[5] in his article brings out a recent debate about the incompatibility and compatibility of missile defence with deterrence. Throughout his article, he tries to find out the relationship between deterrence and defence on one hand, and indeterminacy of deterrence and defence on the other. In doing so, he has analysed several factors that were responsible for the mutual transformation of deterrence and defence. In another article, Nik Hynek[6] investigates the complex relationship between

[2] Department of Defense, *Military and Security Developments Involving the People's Republic of China 2016,* Washington D. C.: Department of Defense, United States of America, 2016.

[3] Press Information Bureau, *Successful Test Firing of AAD Endo-Atmospheric Interceptor Missile,* New Delhi: Press Information Bureau, Government of India, 2017.

[4] Harsh V. Pant, "India Debates Missile Defense", *Defence Studies*, Vol. 5, No. 2, 2005, p. 234.

[5] Aaron Karp, "The New Indeterminacy of Deterrence and Missile Defence", in Ian R. Kenyon and John Simpson (eds.), *Deterrence and New Global Security Environment,* Abingdon: Routledge Taylor & Francis Group, 2006.

[6] Nik Hynek, "Missile Defence Discourses and Practices in Relevant Modalities of 21st - Century Deterrence", *Security Dialogue,* Vol. 41, No. 4, 2010.

missile defence and nuclear deterrence. With an understanding of this general relationship, he focuses on the renewed current relations between the US and Russia. He critically examines the political arguments concerning the need to abandon or overshadow nuclear deterrence in the context of plans to build the missile defence system. According to the author's main argument, the departure of missile defence from deterrence makes no sense, as while the purpose of missile defence is to renew the strategic deterrence between the US and Russia; and thereby strengthening it through reverse deterrence of the US against rogue states. The conclusion made by the author is that missile defence is closely intertwined with deterrence of the 21st century.

Andrew Futter[7] in his article has discussed in detail about the role of missile defence in strengthening nuclear deterrence and future global security agenda such as nuclear non-proliferation policy. In his article, he strongly appreciates President Obama's perception of the deterrent value of missile defence and the subsequent development of comprehensive missile defence decisions in and around the globe. Columba Peoples[8] published a more renowned book, which is very crucial in developing foundational understanding of BMD history and the importance of that history on the contemporary global security agenda. Though this book does not focus on nuclear deterrence, it presents several helpful insights in describing a changing nature of security environment and its relationship with ballistic missile technology.

Some writers also discuss BMD from the perspective of emerging powers such as China and India. Rajesh Rajagopalan is notable for his distinctive contribution in this regard. In his article,[9] he has discussed BMD systems and the impact of such missile defences on strategic stability in South East Asia. While doing this, he analyses American BMD programmes in order to find out how it affects strategic stability in South Asia. In his comparative analysis of different countries' BMD programmes, he focuses on the implications of American BMD systems for China, India and Pakistan.

Based on these various literatures on BMD, this article examines the impact of missile developments in South Asia. The first section of this article is the introduction. The second section analyses the technical aspects of BMD system and their components by which the system operates. The main purpose of this section is to analyse the functions which this system is required to perform in order to overcome the offensive might. An attempt is also made to identify the problem which the system might face to prevent missile attack once it has been launched for targeting a particular area. It examines the critical countermeasures that the attacker may take to disrupt the function of a defence

[7] Andrew James Futter, "Getting the Balance Right: U.S. Ballistic Missile Defense and Nuclear Non-proliferation", *Comparative Strategy*, Vol. 30. No. 3, 2011, pp. 254-267.
[8] Columba Peoples, *Justifying Ballistic Missile Defense: Technology, Security and Culture*, Cambridge: Cambridge University Press, 2010.
[9] Rajesh Rajagopalan, "Missile Defences in South Asia: Much Ado about Nothing", *South Asian Survey,* Vol. 11, No. 2, 2004, pp. 205-216.

system. The third section discusses in detail the concept of nuclear deterrence. This section also incorporates discussion of the 1972 ABM treaty, as well as other initiatives relevant to the analysis of the concept of nuclear deterrence. The fourth section focuses on the implications of missile defence and investigates how it influenced, directly or indirectly, strategic circumstances established by the strategy of nuclear deterrence, on one hand, and undermined its creditability of mutual vulnerability on the other. It does so, by assessing the implications of missile defence for triangular strategic relations among India, China and Pakistan. This section also attempts to examine the compatibility between missile defence and deterrence. In this context, it highlights the role of missile defence in contemplating deterrence in the 21st century from two different perspectives: firstly, missile defence in strengthening the credibility of India's traditional deterrence, and secondly, missile defence in strengthening India's defensive capability against any unauthorised and accidental launch of ballistic missiles by Pakistan. Finally, the fifth section draws the conclusion.

## 2. Technological Aspects of Ballistic Missile Defence

A credible understanding of BMD requires the examination of the concept itself, its components, functions, phases of trajectories and probable countermeasures which are analytically described below in nutshell, under following heads:

### 2.1 *What is Ballistic Missile Defence?*

Since its inception, BMD has been described by many as an interceptor to destroy enemy missile attack. Missile defence as described by the BMD research programme is an interceptor missile to shoot down enemy missiles after they have been detected or tracked by some kind of radars.[10] These systems would be able to protect a target area from the enemy attack by intercepting ballistic Re-entry Vehicles (RVs) of the incoming missile, sometimes even before their re-entry into the earth's atmosphere. Since the BMD is designed to deal with different kinds of threats, the composition of BMD varies according to the nature of a threat. It has, therefore, different levels, many shapes and sizes. Accordingly, ballistic missiles can be categorised on the basis of their ranges as described below:

Short-Range Ballistic Missile (SRBM) up to 800 Kilometres (km); Medium-Range Ballistic Missile (MRBM) range between 800 km to 2400 km; Intermediate-Range Ballistic Missile (IRBM) or Long-Range Ballistic Missile (IRBM) having ranges of 2400 km to 5500 km; Intercontinental Ballistic Missile (ICBM) having ranges in between 5500 km to 15600km.[11]

[10] William Schneider, "Missile Defense System: Past, Present and Future" in Johan J. Holst and William Scheneider Jr. (eds.), *Why ABM? Policy Issues in the Missile Defense Controversy,* New York: Pergamon Press Inc., 1969, p. 1.
[11] *Ibid*.

Some strategic analysts have also classified ballistic missiles under the categories of Theatre Ballistic Missiles (TBMs) and Strategic Ballistic Missile (SBM). TBMs have a range less than 3500 km and can be further categorised into short, medium and long ranges. The German V-2 ballistic missile and Iraq's SCUD missile were the examples of TBM. SBMs are particularly designed to attack neighbouring states. Missiles used to protect the target area against these missile attacks are called BMD. It was hoped that such system would be able to destroy the offensive might and provide a shield against destructive missile armed with nuclear weapons.[12]

### 2.2 *Components of Ballistic Missile Defence System*

The BMD system is the composition of many elements. Each of these elements acting in different directions is together referred to as complete BMD system. Such system contains:

(i) Different types of radars including sea-based, ground-based and space-based radars which are together called network sensors.

(ii) Missile interceptor armed with nuclear warheads is able to operate both within the atmosphere and outside atmosphere.[13] Missile interceptors consist of: (a) the hit to kill technology relying on the force of a direct collision with the incoming missile; (b) multiple warheads. The example of this type of interceptor is the submarine-launched (SLBM) Polaris A-3, which carries three warheads.[14]

(iv) An operational system called C2BMC (command, control, battle management and communications network) acting as a link pin between the sensors and missile interceptors and,

(v) Area defence systems using infrared sensors (IR) and terminal defence systems accomplished with command, control, battle management and communications network.[15]

### 2.3 *Functions of Ballistic Missile Defence System*

Any BMD system, designed to deal with whatever kind of threats, must perform certain functions. The major functions of BMD are:

[12] Tim Youngs and Claire Taylor, "Ballistic Missile Defence", *Government Research Paper*, London: House of Commons Library, 2003.
[13] Stephen Weiner, "Systems and Technology", in Ashton B. Carter and David N. Schwartz (eds.), *Ballistic Missile Defenses,* Washington D. C.: Brookings Institution 1775, Massachusetts Avenue N.W., 1984, p. 49.
[14] Alexander Flax, "Ballistic Missile Defense: Concepts and History", *Daedalus*, Vol. 114, No. 2, 1985, p. 44.
[15] Weiner, *op. cit*., p. 49.

*Target observation*: When a ballistic missile is launched to target a particular area, it is the first function of the defender to find out that target as soon as possible.[16] The most effective way to track the target is to use radar because radar would quickly locate the incoming missile from a long distance. However, the effectiveness of radar is not possible to measure. As Herzfeld observes that a modern radar system can acquire the kind of targets with which one is concerned at a distance of several thousand miles but that does not mean that the defence can tell exactly what is coming at it, only that something is coming.[17]

*Prediction:* Once the radar has detected the target, it is important to track the target missile where it is going, such prediction is necessary to determine the target impact point and to select the potential interceptor points.[18]

*Discrimination:* It is the process to distinguish real warheads that should be intercepted from non-lethal booster fragmented warheads or decoys.[19] This is the most important function performed by BMD system. If BMD system fails to make a proper discrimination between re-entry vehicles carrying nuclear warheads from decoys, the whole BMD system will fail to protect a target system. This is, of course, one of the crucial functions which make the feasibility of BMD technologically uncertain.

*Interception:* After making discrimination, the interceptor of BMD system must be able to reach the target point, at the right time and for the rendezvous with the warheads.[20] The effectiveness of this function depends upon the collision force of interceptor with the incoming missile. It has rightly been observed by Herzfeld that the defence needs the hottest kind of interceptor with a very fast response time and a very large thrust, to cover the distances in very few seconds.[21]

*Command, Control and Communication System:* BMD system has different types of sensors located in different places. Command, control and communication system is a very important device for co-ordinating decision making process amongst these sensors.[22] "This system has to be largely an automatic process, but most experts assert that, somewhere, there has to be a human in the loop."[23]

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[16] Michael Rance, "Technological Aspects of Ballistic Missile Defence", Monterey: James Martin Centre for Non-Proliferation Studies, 2001, p. 27, available at http://www.mcis.soton.ac.uk/publications/missile_proliferation.pdf, accessed on 20 November 2012.
[17] Charles M. Herzfeld, "Ballistic Missile Defense and National Security", *Annals of the New York Academy of Sciences,* Vol. 134, No. 1, 2008, p. 119.
[18] Weiner, *op. cit*., p. 59.
[19] *Ibid.*
[20] Rance, *op. cit*., p. 37.
[21] Herzfeld, *op. cit*.
[22] Jacques S. Gansler, "Ballistic Missile Defense Past and Future", Washington DC: Center for Technology and National Security Policy, National Defense University, 2010, p. 28.
[23] Rance, *op. cit*., p. 37.

*Kill Assessment:* This is the final stage for the defence system to kill the targeting objects. The system is designed to destroy the incoming warheads by hitting or shooting down re-entry vehicles. This system is accomplished by a nuclear warhead and newly employed Nonnuclear Kill (NNK) mechanism known as 'hit to kill' interceptor.[24]

### 2.4 *Phases of Ballistic Missile Defence Trajectory*

When an interceptor has been launched for completing the mission, it goes through different phases of flight called as the boost phase, the midcourse phase and the terminal phase. It offers another way in which BMD system can be classified as a boost-phase, midcourse and terminal defence system.

*Boost Phase Defence Trajectory:* The boost phase defence has significant importance in BMD mission. Even according to some experts, it is the most effective way to counter the enemy missile in flight and to kill it, in its initial phase before they begin to release their warheads. The flight of a ballistic missile during this stage lasts from 300 to 500 seconds for ICBMs and 200 to 300 seconds for Submarine-Launched Ballistic Missiles (SLBMs). Accordingly, a boost-phase BMD is located near the launch site to intercept the target of an attacker. Boost-phase missile interception systems consist of three components: a sensor to track the target, Kinetic-Kill Vehicles (KKVs) to destroy ballistic missile targets and a missile interceptor to launch these KKVs.[25] In addition, it uses the Airborne Laser (ABL) - the world's first high-energy laser weapon (chemical oxygen-iodine laser) mounted on an airborne platform.[26] The ABL would provide the boost-phase missile the ability to engage tactical ballistic missiles as early as possible even while they are still in the enemy's territory.[27] Since in boost phase, a missile is highly vulnerable to destroy as it is large and soft and moves relatively slowly, it would easily be tracked by a BMD system.[28]

Yet, there has been considerable controversy over the technical feasibility of boost phase defence. Many opponents argued that the effectiveness of tracking the incoming missiles in its boost-phase could be reduced by shortening the time duration of launched offensive missile.[29] In other words, since the missile takes its speed in its boost phase to get its optimal speed, BMD systems find it as the most effective phase to track and encounter it, however, once it gets its optimal speed, it becomes

[24] Weiner, *op. cit.*, p. 63.
[25] Dean A. Wilkening, "Airborne Boost-Phase Ballistic Missile Defense", *Science & Global Security*, Vol. 12, 2004, p. 2.
[26] A. Vinod Kumar, "A Phased Approach to India's Missile Defence Planning", *Strategic Analysis*, Vol. 32, No. 2, 2008, p. 174.
[27] Sumner Benson, "Will NATO Deploy European Missile Defense?", *Comparative Strategy*, Vol. 16, No. 4, 1997, p. 389.
[28] Gansler, *op. cit.*
[29] Hans A. Bethe, Jeffrey Boutwell and Richard L. Garwin, "BMD Technologies and Concepts in the 1980s", *American Academy of Arts and Sciences*, Vol. 114, No. 2, 1985, p. 56.

very difficult for BMD systems to track the missile and hence its effectiveness reduces significantly. Thus, if an enemy country makes improvement in its missile trajectory during boost phase in such a way, that it significantly reduces the time to take off missile to get its optimal speed; the missile is enabled to release its countermeasures i.e., the penetration aids and decoys, outside the earth's atmosphere, where many BMD weapons are ineffective to destroy these dummy warheads.[30]

*Midcourse Defence Trajectory*: Once the warheads have been released, they travel through the midcourse phase, for approximately 20 to 25 minutes for an ICBM and 5 to 20 minutes for an SLBM, in which it allows for a long period to build a number of defensive measures capable of intercepting sophisticated warheads and decoys.[31] Presently, the US Advanced Electronic Guided Interceptor System (AEGIS) BMD is the only operational mid-course interception system.[32] However, in this phase, making discrimination of RVs carrying nuclear weapons from other objects such as decoys becomes technologically challengeable. This is, of course, one of the reasons, which makes the capability of midcourse BMD system either vulnerable or ineffective.

*Terminal Defence Trajectory*: The final phase in the ballistic missile trajectory is the terminal phase, in which a defence could possibly operate against the enemy RVs during its last stage of flight. Since the terminal defence phase has a very short duration for the interception as it is lasting only up to 2 to 3 minutes, it requires high accelerated interceptor missiles to get find out RVs as quickly as possible. One major disadvantage of this system is that in the terminal defence, all the fighting goes on over one's own territory and that one has, so to say, no second chance, if one has made a mistake.[33]

### 2.5 *Countermeasures*

Human being has inherited the nature of domination and resistance from the very beginning of human civilisations. Since this domination and resistance phobia has a direct correlation with accelerated or diminished capability of offence-defence weapons, it is found that there is a continuous race between swords (offensive) and shield (defensive).[34] In other words, the more improvements one makes to the shield, the more improvements are made to the sword as well.[35]

[30] *Ibid.*
[31] Benson D. Adams, *Ballistic Missile Defense,* New York: American Elsevier Publishing Company, Inc., 1971; see also Bethe, Boutwell and Garwin, *op. cit*., p. 4.
[32] Kumar, *op. cit*.
[33] Herzfeld, *op. cit*.
[34] Wilbert van der Zeijden, "The Essence of Ballistic Missile Defense: A Three Level Analysis of the US Decision to Develop and Deploy Ballistic Missile Defense", Master Thesis, Amsterdam, Netherlands: The Vrije Universiteit, 2007, p. 2.
[35] *Ibid.*

Much of the public discourse, over BMD system, has centred on the promise held out by offensive means, used in penetrating defences, especially the so-called countermeasure tactics. These techniques include various types of decoys, the use of balloons, cones, dispensing chaff, penetration aides (darts and jacks) and salvage fusing, Multiple Re-entry Vehicles (MIRV) and manoeuverable warheads.[36] Each of these countermeasures increases the complicity of the defensive task of BMD system. As Rance[37]observes, it is impossible to guess every aspect of the offence plan, after all, this is not a game with rules. Even to some experts, these types of defensive devices could pose a greater security threat to a space-based missile defence system.[38]

The game of countermeasures and counter-countermeasures goes on in every aspect of ballistic missile operations, like any other weapon development.[39] Any country which develops BMD system, could also develop some kind of countermeasures to intercept enemy missiles from penetrating the defence. This is the logic behind the current strategy of developing a multilayered BMD system which would be able to intercept the incoming missile in all the phases of flight.

### 3. The Strategy of Nuclear Deterrence

Nuclear deterrence strategy is based on the promise of retaliatory action or the threat of punishment, if the concerned potential entity whether state or collective group is attacked either by conventional or nuclear weapons.[40] The strategy is, therefore, founded on the belief that the outcomes of a first attack would lead to unacceptable devastating damage for a potential adversary and, thus, ensures no attack in the first place. As Rajagopalan[41]observes, retaliatory deterrence seeks to prevent aggression by threatening unacceptable damage in retaliation or by the threat of punishment. The main logic behind this strategy is that if both the parties in a conflict maintained the capability of the second strike after being attacked, neither side would engage in an aggressive behaviour because vulnerability came to be seen as destructive for both the sides.[42] Thus, the strategy of mutual vulnerability and assured destruction is comprehensively linked to the strategy of nuclear retaliation. The importance of these strategies lies in the fact that they ensure the credibility of the threat of retaliation by making clear the causality about the means and ends.[43]

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[36] J. I. Coffey, "The Anti-Ballistic Missile", *Foreign Affairs*, Vol. 45, No. 3, 1967, p. 403; see also Adams, *op. cit*., p. 8.
[37] Rance, *op. cit*., p. 40.
[38] Bethe, Boutwell and Garwin, *op. cit*., p. 77.
[39] Gansler, *op. cit*., p. 34.
[40] Nik Hynek, "Missile Defence Discourses and Practices in Relevant Modalities of 21st – Century Deterrence", *Security Dialogue,* Vol. 41, No. 4, 2010, p. 435.
[41] Rajesh Rajagopalan, *Second Strike Arguments about Nuclear War in South Asia*, New Delhi: Penguin Group, 2005, p. 21.
[42] Robert M. Soofer, *Missile Defenses and Western European Security*, New York: Greenwood Press, 1988, p. 45.
[43] Rajagopalan, *op. cit*., p. 22.

However, the primacy of deterrence by retaliation goes back to the earliest days of the Cold War. It was achieved on 26 May 1972, when the US President Richard Nixon and the Secretary of former Soviet Union, Leonid Brezhnev signed a negotiation treaty, popularly known as ABM Treaty. The net effect of this treaty was that it had not just eliminated the provision to developing a full-scale defensive security system but at the same time enhanced the strategy of nuclear deterrence through the clear recognition of adhering large scale offensive nuclear arsenals.[44]

### 3.1 *The ABM Treaty*

The effort to negotiate an agreement for arms control, which had been going on since 1960, got a fresh incentive after the signing of ABM Treaty at Moscow on 26 May 1972. This treaty imposed mutual renunciation of defensive systems against intercontinental ballistic missiles, in which it eliminated incentives to build up BMD.[45] However, the main purpose of ABM treaty is to ensure strategic stability by retaining the Mutual Assured Destruction (MAD) as the cornerstone of security policy. The basic assumption behind this security policy is a mutual vulnerability in which the use of a nuclear weapon by one side would ultimately lead to the destruction of both sides.[46] The treaty is, therefore, considered by many as a cornerstone of strategic stability. This achievement of ABM Treaty has had previous incarnations, as the Strategic Arms Limitation Talks-SALT I and SALT II and the Intermediate-Range Nuclear Forces (INF) Treaty, which limited the development of two types of nuclear weapons namely: intermediate-range and intercontinental-range missiles.[47] All these treaties acted as a strong bargaining chip in the negotiation of ABM treaty.

However, a major change in the treaty made in 1974, was by the amendment of Article III of the treaty. While the original treaty had permitted for the two ABM development sites both for the US and the Soviet Union - one to defend its national capital and the second one to defend ICBM silos; the 1974 protocol reduced the number of ABM development but permitting each to one development site.[48] Additionally, the treaty had prohibited the development of multiple ABM launchers and interceptors at launch sites.

The 1972 ABM Treaty in many ways laid the foundations of the strategic stability. The special significance of the treaty lies in the fact that by prohibiting

[44] Soofer, *op. cit*.
[45] Igor Ivanov, "The Missile-Defense Mistake: Undermining Strategic Stability and the ABM Treaty", *Foreign Affairs*, Vol. 79, No. 5, 2000, p. 15.
[46] Kim Holmes, "Arms Control and Missile Defense Options: Contending Perspectives", in Robert L. Pfaltzgraff, Jr. (eds.), *Security Strategy and Missile Defense*, Herndon, Virginia, U.S.A.: The Institute for Foreign Policy Analysis in Association with the Fletcher School of Law and Diplomacy, Tufts University, Brassey's, Inc., 1996, p. 48.
[47] Ivanov, *op. cit*., p. 15.
[48] John B. Rhinelander, "The ABM Treaty: Past, Present and Future", *Journal of Conflict and Security Law*, Vol. 6, No. 1, 2001, p. 98.

nationwide development of ABM system, it led in a major way to the signing of the Interim Agreement Treaty on strategic offensive arms. The treaty has, therefore, important implication over the offensive and defensive warfare of strategic arms race. Although this treaty in no way imposed an overall restriction on missile development, it did not prohibit or even limit research programme on ABM system. In contrary to this provision, Article V of the treaty prohibits the testing, development, or deployment of all ABM systems or components which are sea-based, air-based, space-based, or mobile land-based.[49] Both of these provisions are logically contradictory which make widespread disagreements regarding the effectiveness of ABM Treaty. Due to this contradiction on 13 June 2002, the US officially announced its withdrawal from the ABM treaty and began deployment of a ground-based National Missile Defence (NMD) system.

The US-centric development of ballistic missile defences posed threats to several countries with which the US was competing either during Cold War such as Russia or other countries which the US saw as its potential rival in future such as China. Under the underlying policy of Morgenthau's balance of power, these countries rushed to enhance their defensive mechanism in order to also sharpen their offences at the same time.[50] The communication, rocket and satellite revolutions whereas helped China to develop its own indigenous ground-based missile defence system; India has developed a strong BMD system with the help of Russia and Israel to counter the greater threat from its hostile neighbours. While India starts to deploy its indigenously built BMD system, Pakistan has been trying hard to reduce the asymmetry by developing its own missile defence system with the help of China.

## 4. BMD: Implications for India's Nuclear Deterrence Strategy

There are at least three favoured scenarios on the basis of which the implications of missile defence for India's nuclear deterrence strategy can be analysed. Firstly, missile defence could reduce the credibility of India's nuclear deterrence and in reverse would destabilise the strategic relationship between China and India. Secondly, missile defence could initiate arms race and in reverse would be destabilising India and Pakistan relations. Finally, missile defence, as is being witnessed today has been reducing the possibility of non-proliferation. These possibilities are analysed below.

[49] Abraham D. Sofaer, "The ABM Treaty and the Strategic Defense Initiative", *Harvard Law Review,* Vol. 99, No. 8, 1986, p. 1973.

[50] Musarat Amin *et al*., "Realism - Dominating Theory in International Relations: An Analysis", *Berkeley Journal of Social Sciences,* Vol. 1, No. 7, 2011.

### 4.1 *Impact of Missile Defence in Reducing the Credibility of Nuclear Deterrence and Rising Tensions between China and India*

One of the practical implications of missile defence which are witnessed today is that missile defence has been destabilising deterrence stability based on the threat of nuclear retaliation. Since deterrence stability is based on the threat of nuclear retaliation, the pursuit of missile defence by one country would deny other side's capability to retaliate and in turn would reduce the vulnerability of Mutual Assured Destruction (MAD).[51] This issue has caused considerable concern for emerging powers like India as it adopted the minimum credible deterrence strategy. Many opponents of BMD argue that since the development of BMD strengthens first-strike force (such as the US) to such an extent that it would be able to carry a successful assault on enemy nuclear warhead and in retaliation, the enemy state would not be able to survive, thus, it would make difficult for Small Nuclear Forces (SNFs) to deter larger nuclear forces.[52] In this regard, as China possesses greater missile superiority in contrast to India, it has the ability to strike first deep into the Indian territory and in reaction, India may not be able to retaliate. Though China's security policy is largely dominated by offensive strategy but at the same time, China also recognised the importance of missile defence capabilities which is confirmed by the words of Mao, "missile defence capability should not be dominated by the two superpowers only, China must also develop its own missile defence weapons, no matter how long it would take."[53] In recent years, American withdrawal from the ABM treaty has increased China's concern for missile defence and as a response to changing global order, China in 2003 initiated a new BMD programme known as Project 863 for developing more advanced interceptors to destroy both intermediate and intercontinental ballistic missiles.[54] Further, in 2004, China also purchased 120 S-300P interceptor systems from Russia and with its help soon produced its own versions: *Hongqi* 9 (HQ), HQ10 and HQ15 systems.[55] The HQ-9 SAM defence system is designed to defend China against long range surface to air missile with a range up to 90 km and 27 km altitude.[56] This system is similar in performance to the US PAC-3 and Russian S-300P interceptors.

Besides, China is increasingly developing various anti-ship ballistic missiles (ASBM). Admiral Robert F. Willard, the Commander of the US Pacific Command, reported in August 2010 that China had successfully tested a land-based anti-ballistic

[51] Soofer, *op. cit*., p. 88.
[52] Rajesh Rajagopalan, "Nuclear Strategy and Small Nuclear Forces: The Conceptual Components", *Strategic Analysis*, Vol. 23, No. 7, 1999, pp. 1117-1131.
[53] Sino defence, "Project 640: China's National Missile Defence in the '70s", available at http://www.sinodefence.com/special/airdefence/project640.asp, accessed on 20 September 2012, p. 1.
[54] Duncan Lennox Obe, *Janes's Strategic Weapon Systems*, Coulsdon, Surrey: IHS Jane's, IHS (Global) Limited, Issue 55, July 2011, p. 229.
[55] R. N. Ganesh, *Nuclear Missile-Related Risks in South Asia,* Carlisle, USA: Strategic Studies Institute of the US Army War College (SSI), 2012, p. 326.
[56] A. Vinod Kumar, *The Dragon's Shield: Intricacies of China's BMD Capability*, New Delhi: Institute for Defence Studies and Analyses (IDSA), 2010, p. 5.

missile known as Dong Feng-21D, which is the world's first long range, land-based carrier killer anti-ship ballistic missile reaching to Initially Operational Capability (IOC).[57] According to a report of CRS prepared by Rinehart *et al*.,[58] China recently successfully tested a ground-based missile interceptor within its own territory on 27 January 2013. In July 2014, it also tested an anti-satellite weapon in order to demonstrate its BMD capability.[59] More recently, it has expressed its desire to acquire Russia's most advanced S-400 anti-aircraft BMD system while India has also shown its keen interest to purchase this multi-layered missile defence system.[60]

Hence, in this context, it can be said that missile defence development would create a new tension among the regional nuclear powers. In such a situation, fear of insecurity has led to a massive development of strategic ballistic missile defences and pulling regional nuclear powers like India to spend great sums to strengthen its defence capability to prevent the first strike attack. Like China, India is also developing its own indigenous missile defence system. Indian ballistic missile defence systems include the Advance Air defence (AAD), the *Prithvi* series of Surface-to-Surface missiles (SSM), the Nag Anti-Tank Guided Weapon (ATGW) and the *Akash* Surface-to-Air missile.[61] As part of this programme, India is also developing the *Sagarika* (SLCM), the *Dhanush* and *Brahmos* (SLBM), the *Astra* Surface to Air-Anti-Missile (SAAM), *Surya* (ICBM) and the *Trishul* (SAM).[62] Recently, India was planning to deploy six divisions of *Akash* missile in the north-eastern region of India to counter the potential air threat from China.[63] In addition, India's Defence Research and Development Organisation (DRDO) has repeatedly upgraded the range of *Akash* system up to 40-60 km to counter IRBM threats.[64] Recently, the US cleared Indian desire of purchasing its aided Arrow missile defence of Israel as it sees India as a 'lynchpin' in its strategic move called 'Asia Pivot'.[65] In fact, this move is considered as part of the US policy to balance its

[57] Andrew Erickson and Gabe Collins, "China Deploys World's First Long Range, Land Based 'Carrier Killer': DF-21DAnti -Ship Ballistic Missile (ASBM) Reaches 'Initial Operational Capability' (IOC)", *China Signpost*, No.14, 2010, p. 2.

[58] Ian E. Rinehart, Steven A. Hildreth and Susan V. Lawrence, *Ballistic Missile Defense in the Asia-Pacific Region: Cooperation and Opposition,* No. R43116, Washington D.C.: Congressional Research Service, 2015, p. 8.

[59] *Ibid.*

[60] Akash Sinha, "Pakistan Deploys Chinese Air Defence System: Where does India Stand?", *The Economic Times*, 15 March 2017.

[61] Varun Sahni, "India and Missile Acquisition: Push and Pull Factors", *South Asian Survey*, Vol. 11, No. 2, 2004, p. 290.

[62] Neha Kumar, "Engaging China's Nuclear and Missile Threat", *India Quarterly: A Journal of International Affairs,* Vol. 65, No. 1, 2009, p. 46; see also Sahni, *op. cit*., p. 90.

[63] NTI, Nuclear Threat Initiative, "India Missile Chronology", Monterey, California: the James Martin Center for Nonproliferation Studies, available at http://www.nti.org/media/pdfs/india_missile_3.pdf?_=1339452308, accessed on 29 June 2016.

[64] Anupam Srivastava, "India's Growing Missile Ambitions: Assessing the Technical and Strategic Dimensions", *Asian Survey*, Vol. 40, No. 2, 2000, pp. 325-326.

[65] Arun Sahgal, "India and US Rebalancing Strategy for Asia-Pacific", New Delhi: The Institute for Defence Studies and Analyses (IDSA), 09 July 2012, available at http://www.idsa.in/idsacomments/IndiaandUSRebalancingStrategyforAsiaPacific_asahgal_090712, accessed on 27 October 2015; see also C. Raja Mohan, "The New Triangular Diplomacy: India, China and America at Sea", *The Diplomat*, Tokyo, 05 November 2012, available at http://thediplomat.com/2012/11/05/the-new-triangular-diplomacy-india-china-and-america-on-the-high-seas/, accessed on 27 November 2015, p. 1.

traditional non-allies in Asia (Russia, China and India) by preventing their combination to undercut its geopolitical interests.[66] Accordingly, India got an opportunity to access the western ballistic missile defence market. There are also reports that India is trying to use *Arrow* missile technology purchased from Israel to upgrade *Akash* into an anti-tactical ballistic missile.[67] Indeed, India has started to develop the airborne early warning (AEW) platform along with phased array radar technology to materialise its vision of developing *Arrow* anti-tactical ballistic missile system or ATBM system.[68]

However, the capacity to absorb an enemy first-strike requires enough forces and credible BMD to defeat the enemy and SNFs are by definition incapable to fight against a larger nuclear force.[69] Thus, the challenge for India essentially becomes one of managing a credible deterrence with its relatively small arsenals against the background of its asymmetric deterrence relations with China.[70]

### 4.2 *BMD: Implications for India-Pakistan Strategic Relations*

The worst-case scenario of BMD would involve with the destabilising counter-responses from Pakistan. Even though Pakistan has still not developed a BMD system but there is a strong element of truth to this argument, that Pakistan would counterreact towards Indian BMD programmes by acquiring BMD capability from China. The National Bureau of Asian Research has reported that Pakistan has already started development of *Hatf* and *Abdali* missile to counter India's *Prithvi* missile with Chinese assistance.[71] Although these missiles apparently have no BMD capability but once completed, they would be able to strike any target in India.[72]

In this respect, India's anxieties have been exacerbated by a perception of growing prospect of China's aid to Pakistan ballistic missile system that could reduce Pakistan's vulnerability to India. More importantly, it makes India's strategic deterrence ineffective to deter Pakistan's intervention in Kashmir in the event of a future deterioration. This assumption has led to the detrimental impact on the triangular relationship among India, China and Pakistan and the negative consequences for regional security. This scenario has rather perceptively been observed by Gizewski[73]

[66] Ashley J. Tellis, "The Evolution of U.S.-Indian Ties: Missile Defense in an Emerging Strategic Relationship", *International Security*, Vol. 30, Vol. 4, 2006, p. 150.
[67] A. Z. Hilali, "India's Strategic Thinking and its National Security Policy", *Asian Survey*, Vol. 41, No. 5, 2001, p. 753.
[68] Gregory Koblentz, "Theater Missile Defense and South Asia: A Volatile Mix", *The Non-proliferation Review,* Vol. 4, No. 3, 1997, p. 54.
[69] Rajagopalan, *op. cit*., p. 1125.
[70] P. K. Ghosh, "Deterrence Asymmetry and Other Challenges to Small Nuclear Forces", *Contemporary Security Policy*, Vol. 25, No. 1, 2004, pp. 37-53.
[71] Michael D. Swaine and Loren H. Runyon, "Ballistic Missiles and Missile Defense in Asia", *National Bureau of Asian Research*, Vol. 13, No. 3, 2002, p. 30.
[72] *Ibid*.
[73] Peter Gizewski, "The International Politics of Missile Defence: A Response to Harvey", *International Journal,* Vol. 56, No. 3, 2001, p. 529.

as he rightly asserts that missile defence is triggering an automatic chain reaction of missile proliferation among the US, China, India, Pakistan and possibly others are somewhat more compelling to fall in that line. As Pant asserts, "many other states in India's extended neighbourhood such as Iran, Syria and Saudi Arabia are undertaking their own missile programs."[74] Thus, the impact of BMD on nuclear deterrence is not limited to the US relations with Russia rather extended to the Transatlantic relationship. As one commentator claims that the possible impact of any type of missile defence is high because it is unlikely to enhance global security above the level offered by retaliatory deterrence.[75]

### 4. 3 *BMD: Implications for Missile Non-Proliferation*

The greatest cause of concern over BMD lies in their potential to undermine arms control and to stimulate arms race.[76] It has rightly been observed by Sahni[77]that the likelihood of missile non-proliferation and non-acquisition becoming a norm in South Asia is diminishing rapidly. As stated earlier, India is decided to acquire more advance BMD systems from Israel. China already has an agreement with Russia that permits China to build the S-400 system under licence in China. A developed version of Chinese made S-400 system could be sold to Pakistan, especially considering the fact that China is not a party to the Missile Technology Control Regime (MTCR) that currently prohibit such transfers.[78] India has recently joined MTCR but it does not impose any restriction on India's desire to build an indigenous and well developed ballistic missile system to meet its national security requirements.[79] Thus, the effect of BMD may have different directions. On the one hand, whereas there has been growing concern for the development of BMD; on the other, it has also increased competition in the technological development of BMD systems.[80] In this context, it can be said that a strong desire for acquiring BMD technology either by China, India or Pakistan would certainly undermine South Asia's traditional stance for global disarmament movement.

Although missile defence is viewed as destabilising in the context of arms control and missile proliferation but behind this argument, usually lays a set of assumptions about the role of missile defence in complementing deterrence in the

[74] Harsh V. Pant, "India Debates Missile Defense", *Defence Studies*, Vol. 5, No. 2, 2005, pp. 228-246.
[75] H. James Lebovic, "The Law of Small Numbers: Deterrence and National Missile Defense", *Journal of Conflict Resolution*, Vol. 46, No. 4, 2002, p. 445.
[76] Wyn Q. Bowen, "Missile Defence and the Transatlantic Security Relationship", *International Affairs,* Vol. 77, No. 3, pp. 485-507.
[77] Sahni, *op. cit*.
[78] Rajesh Rajagopalan, "Missile Defences in South Asia: Much Ado about Nothing", *South Asian Survey,* Vol. 11, No. 2, 2004, pp. 205-216.
[79] Ministry of External Affairs, *Question No. 2815 Status of India's Membership to MTCR,*New Delhi: Ministry of External Affairs, Government of India, 2016.
[80] Rinehart, Hildreth and Lawrence, *op. cit*., p. 8.

21st century.[81] For instance, if the logic of missile defence (denial) begins at the point when the threat of nuclear deterrence fails,[82] it believes that the addition of defensive forces could extend the usefulness of deterrence beyond the framework of nuclear retaliation. In light of this assumption, India's pursuit of missile defence appears to be a logical continuation of the strategy of deterrence in the form of 'deterrence by denial'.

However, to understand the above conceptualisation, first of all, it is necessary to assess the different nature of 'nuclear deterrence' and 'deterrence by denial' in a different period of time rather than to assess the framework of a larger strategy in which it performs its function. While the former is defined as deterrence by the threat of punishment or retaliation; the latter is based on deterrence by denial which primarily aims to prevent an adversary from achieving its objectives through the measures that are truly defensive. Nuclear deterrence is considered as one of the basic foundations of deterrence between and among nuclear powers, however, with changing nature of threats from rogue groups like terrorist organisations who have no land, no identity; no clear structure of responsibility brought the retaliation concept under widespread criticism these days. Since the nuclear threat is directed against a sovereign state, it is not able to deter such groups without having sovereign lands and much to lose. The most relevant example of this was the terrorist attack on an Indian Army camp in Uri, Jammu and Kashmir on 18 September 2016, where despite the immense retaliatory capability of India, an adversary was willing to attack and face the consequences.[83] In such a security structure, missile defence is viewed by Indian strategic experts as an alternative means to deter such threats. This serious thinking was immediately materialised by Indian policymakers within six months of Uri attack, when New Delhi successfully launched an AAD endo-atmospheric interceptor missile in March 2017. Following the success of an AAD interceptor missile, Avinash Chander, former DRDO chief stated that "this is a huge achievement for India. This interceptor missile defence system gives us multi-layered capability, both for medium and short range missiles. For India, this means protection primarily on the western front that is against Pakistan."[84]

However, while it is true that one of the incentives of India's BMD programme is to ensure security, it is not the sole reason. India acquires BMD technology to purposefully achieve the following strategic goals: firstly, to maintain the credibility of its nuclear deterrence against powerful rival states such as China and to ensure strategic stability in the region; secondly, to access

[81] Leon Sloss, 'The Strategist's Perspective', in Ashton B. Carter and David N. Schwartz (eds.), *Ballistic Missile Defenses,* Washington D.C.: Brookings Institution, 1775 Massachusetts Avenue N.W. 1984, p. 24.
[82] Rajesh Rajagopalan, *Second Strike Arguments about Nuclear War in South Asia*, New Delhi: Penguin Group, 2005, p. 23.
[83] Derek D. Smith, *Deterring America: Rouge States and the Proliferation of Weapons of Mass Destruction*, New York: Cambridge University Press, 2006.
[84] Smriti Jain, "India's Impregnable Ballistic Missile Defence Interceptor Shield is a Strong Message to Pakistan", *The Financial Express*, 02 March 2017.

advance weapon technologies and thirdly, to raise its status as a global power. India's recent entry into the exclusive club of five nations who have possessed multi-layered BMD system namely the US, Russia, Israel and China clearly reflects New Delhi's ambitions to enhance its power projection capacity. In many respects, the increase in India's missile arsenals not only reflected a change in the global power structure but also reflected New Delhi's growing concern over Beijing's military strategy. There are reports that China in recent years has been developing new techniques to deploy its Anti-Access/Area-Denial (A2/AD) strategy in the western part of its territory.[85] These technologies have potential to strike deep into the territory of India. It is, therefore, imperative for India to develop a robust BMD system to defeat Chinese A2/AD capability.[86]

Hence, in this context, it can be said that apart from renewed traditional deterrence, missile defence may even provide many plausible ways to ensure strategic stability in South Asia. On one hand, missile defence bolsters deterrence equations between the two rival nuclear powers - China and India; on the other, it would also provide a strong shield against the unauthorised and accidental launch of ballistic missiles by rogue states or terrorist organisations.

## 5. Conclusion

The stable security order in South Asia depends on the matrix of both offence and defence capability. But once China takes the US on opposite side by engaging in BMD race, India would become bound to balance China and so will Pakistan following India. In fact, India has fought one war with China, and three formal wars and one informal war with Pakistan. Thus, the three big Asian states have been historically hostile to their neighbours. Nevertheless, many analysts argue that India does not resort to any direct military adventurism against Pakistan since Islamabad has already acquired nuclear coverage which reflects that nuclear deterrence is an effective mechanism for peace and security. However, the recent Chinese engagement to develop a missile defence system for Pakistan has intensified future threats to India. Any technology that provides a shield against these threats will likely to be supported by Indian policymakers. In this regard, it can be said that Indian policymakers seemed to have well analysed the writings of D.G. Brennan, who says, "procuring defenses is like buying 'insurance' that would limit the consequences of war; the outcome would still be a disaster, but probably one of a very different order than would result from having the same offensive forces expended in a war with no missile defense.[87]

[85] Balraj Nagal, "India and Ballistic Missile Defense: Furthering a Defensive Deterrent", Washington, D. C.: Carnegie Endowment for International Peace, 2016.
[86] *Ibid*.
[87] D. G. Brennan, "The Case for Missile Defense", *Foreign Affairs*, Vol. 47, No. 3, 1969, pp. 434-435.