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STRATEGIC CULTURE AND NUCLEAR ARMS: A STUDY OF ACTION REACTION MODEL BETWEEN INDIA AND PAKISTAN

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Abstract

India and Pakistan are trapped in a nuclear arms race. This research studies the reactive Indo-Pak arms race considering their modernization plans and aspirations regarding nuclear weapons. It uses Samuel. P. Huntington's Action reaction model to study the causes and pattern of acquiring nuclear related capabilities by India and Pakistan. It is a descriptive study that gives a brief reference to unresolved issues between Pakistan and India, it studies their strategic cultures, reasons for acquiring nuclear weapons, their nuclear doctrines and policies to set a holistic understanding to action reaction chain mired with fears and suspicions. At last it studies the modernization plan for missile systems adopted by Pakistan and India to strengthen their defence and develop a credible force.

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1. Introduction

Arms race as defined by Colin Grey is two or more states, perceiving themselves in adversarial relationship, continue to increase or improve their armaments at rapid pace and structure their military postures while attentively responding to the past, present and future political and military behavior of other parties (Craig & Valeriano,

2016). Action-reaction model of arms race focuses on the reciprocal pattern of arms procurement between states. Pakistan and India are trapped in nuclear arms race that stems from mutual fear and suspicions between them. In order to draft an action-reaction pattern between Pakistan and India this research uses Huntington's Action-Reaction Model to study the reason underlying South Asia's nuclear arms race, their nuclear policies and qualitative modernization of weapon systems. It will first examine the geopolitical realities and strategic cultures to identify core reasons, and then it will briefly look into Indo-Pak relations after 1998 to observe the relationship between peace and arms race. Secondly it will study the nuclear policies of India-Pakistan that provide foundation for their respective weapon modernization and their development of identical and complementary nuclear capabilities.

2. Literature Review

The section aims to present the research done on the arms modernization of India and Pakistan with reference to the works of authors from Pakistan and India. To represent Pakistan's case Nasreen (2017) put forward the argument with history of Indo-Pak relations. Pakistan security conscious arises from Indian ambitions to undo Pakistan. She explains that Pakistan's Indian centric defense posture appeals to modernize its military capabilities. She discusses nuclear and missile programs and nuclear posture of India and Pakistan. Khan, & Abbassi (2016) in their paper shed light on Pakistan's nuclear doctrine, Pakistan maintains minimum credible deterrence. Pakistan's nuclear program is India centric and defensive in nature. Pakistan has taken multiple initiatives for security of nuclear weapons and it must be considered responsible nuclear state. They have also proposed some recommendations for strategic nuclear stability in South Asia.

The Indian perspective can be explained by the views expressed by Indian authors such as Kampani (2014) argues that in recent years there is much noise about India's increasing capabilities and spending on its military and nuclear program. Many experts claim that India aims to compete with world powers and such efforts are threat to deterrence in South Asia and Asia-Pacific. While author claims that this view is a false depiction of Indian arms modernization and cannot be supported with empirical evidence. Narang (2012) studies the possibility of stabling, stability-instability paradox in context of India and Pakistan's military modernization. He discusses weapons up gradation and technological sophistication by India as tenuous effort for stability at strategic nuclear level that will aid war termination and avert possibility of full nuclear exchange between India and Pakistan. Chakma (2014) in his book gives the history of nuclear South Asia by highlighting the process of acquisition of nuclear technology, nuclear posture and security by India and Pakistan. He views it as Pakistan's effort to drag itself in Sino-India arms built up.

Dhanda (2011) highlights the implications of improving missile technology by India and Pakistan. The bilateral tensions and arms built up between Pakistan and India is dragging South Asia in arms race therefore author emphasizes on establishing a ballistic missile restraint regime. To include an international perspective on South Asia's nuclear arms race, Ladwig III (2015) in his article argues that there is much hype about India's military modernization because of its increased defense spending and exports. This in turn provides Pakistan with an excuse for advancing its missile and tactical nuclear weapons. He quotes reference to analysts in order to assert that India's conventional modernization can spur nuclear arms race in region. Indian technological advancement and military modernizations don't affirm its superiority over Pakistan in conflict scenario. He believes in the success of deterrence.

3. Theoretical Framework

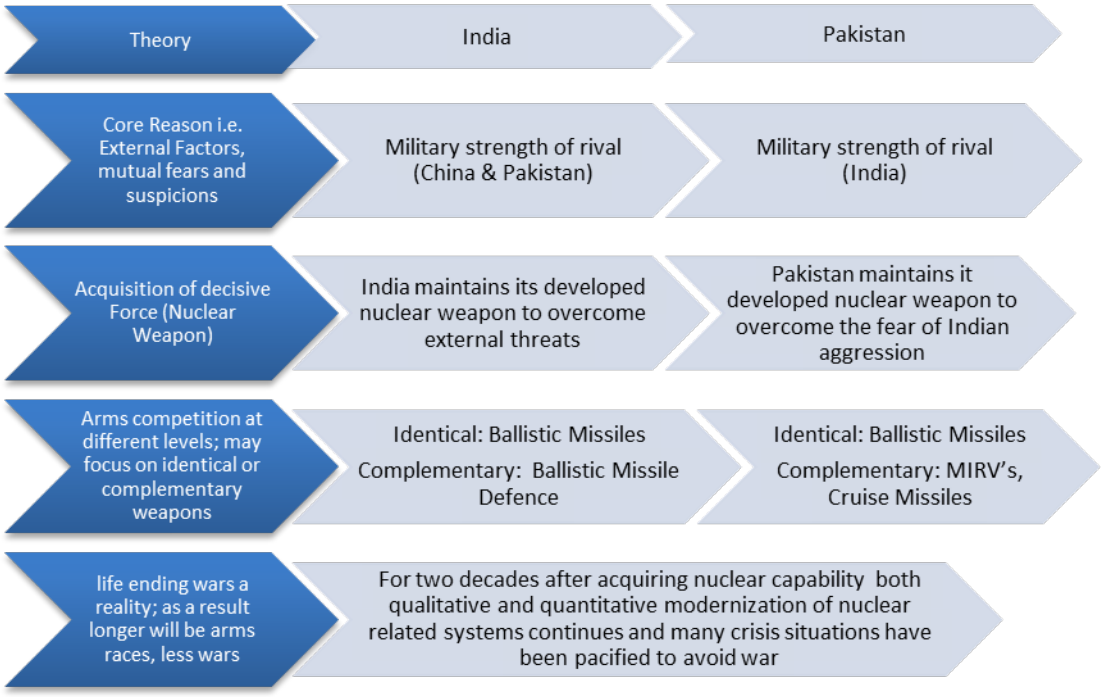
The purpose of studying arms race is to draft an understanding of relationship between states and resultant war, peace or stability. Arms race is a show of arms procurement between states who perceive the military strength of rival as a threat to their security. The purposes for engaging in arms race can be revising status quo, maintaining status quo, deterring enemy with advance weapons, avoiding war etc. Arms race can be studied with several frameworks which address the diverse motives for states expanding their capabilities and factors that engage states in arms procurement, these frameworks provide set of assumptions to predict future behaviour of states. The popular models developed in this regard to study Cold War Arms race include Action-Reaction model (Spiral Model), Repeated Prisoner's Dilemma model and Deterrence model. This article uses action-reaction model, the action-reaction arms race is based on mutual fears that lock contesting states in a self-reinforcing cycle of acquiring advance weapons and sophisticated technologies to strengthen their defence. This pattern of arms race can lead to pre-emptive or accidental war if technology favours offence over defence, however if states chose to cooperate this can lead to arms control (Kydd, 2000). Action reaction model emphasizes that external threats compel states to join arms race. In a non-cooperative environment the military strength of one state in region changes the paradigm of regional security and other states feel threatened (Acharaya, 1994). Ball has argued that reciprocal action-reaction and increasing military capabilities are two essential features of arms race (Tan, 2014). In the real world this reciprocity is observed in arms acquisition and not in disarmament, if a state decide to lower its arms other state will continue to increase (Cashman, 2013). Furthermore arms race is continuous and focused competition, states may choose to compete in specific areas, this is because a multi-dimensional arms race will be mutual exhaustive, expansive and unsustainable (Lash, 2012). The systematic study of action reaction dynamics in arms race started with theory proposed by L. F. Richardson, he introduced quantitative study of

arms race by using differential equations. Richardson focused on motive of fear; he observed that arms of other states direct a state to increase its arms (Kinsella, Russett, & Starr, 2012). Soon the action reaction interested many other scholars to devise their theoretical models such as Huntington, Wallace, Collin Grey, Galtung, Barry Buzan to mention few. They used different techniques, variables, sample sizes, indicators, time periods etc to study arms races. Cold War arms race between United States and Soviet Union generated a considerable amount of literature on arms races, but the field experienced down turn after Cold war ended.

In 1958, Samuel P Huntington's 'Arms Races: Pre-requisites and Results' was published. According to Huntington arms races result from conflict of purposes or mutual fears among nations (Mahnken, Maiolo, & Stevenson, 2016). He defined arms race as a peace time, progressive competition between two states or coalitions of states driven by conflicting purposes and mutual fears that is reciprocal. It is an inter-related increase in arms which establishes dynamic equilibrium if continues over time (North, 1984). For Huntington arms race occurs in the same system of balance of power, the strength of arm forces is symbol of states' power, he also maintains that for an action reaction arms race rival states must know the about the military strength of other state and weapons are designed to combat the weapons rival has (McGuire & Mcguire, 1965).

According to Huntington arms races began with state's change in self-perception therefore the states restructure their forces and polices according to the needs of new position. Huntington observed that when two states having similar force structure engage in arms race, it will revolve around a decisive force (Lash, 2012). Huntington studied both quantitative and qualitative arms races; the quantitative arms race implies the size of forces and qualitative means technological features of weapons and tactical prowess of troops (Kydd, 2000). The shift from quantitative arms race to qualitative one is possible but if a state shift from qualitative to quantitative it can be a signal for war. Qualitative arms races are more dangerous because they include decisive force and the technological advancements make fatal weapons that lead towards life ending wars (Intriligator & Brito, 1984). Huntington feared that wars are more likely in early years of arms race, states may wage preventive wars or preemptive war, however with passage of time states will develop a psychological soothing but it isn't universal (McGuire & Mcguire, 1965)

Table 1: Action Reaction Model



Source: Developed by researcher

4. Root Causes of Arms Race between Pakistan and India

This section establishes a link between action reaction model and case study of arms race in South Asia. Action-Reaction model proposes that fears and suspicions engage states in arms race; in South Asia the unresolved conflicts and strategic cultures manifest the distrust between Pakistan and India. Huntington observed that war was more likely in initial years of arms race because status quo state can wage a pre-emptive war to crush adversary or a weaker state will find offense feasible than defence.

4.1 Geopolitics

The geopolitics of a region and states determine their role in international politics thus, the geopolitics of South Asia makes it one of the important regions as it rest at the coast of warms waters, connect the land lock central Asia to sea, neighbours the busiest trade route, is a big market and large population etc. South Asia's account of modern history revolves around animosity between India and Pakistan rooted in the partition of subcontinent by British colonizers. Geographical placement and political culture are part of geopolitics, which leads to a set of long standing unresolved issues between Pakistan and India.

4.1.1 Unresolved Issues and Wars

History plays a significant role in developing security conscious and security policy of states. Pakistan and India fought their first war on Kashmir in 1948. The unsettled Kashmir issue is

the result of incomplete partition plan; during the partition process princely states in India were given the right to decide their future. Kashmir had Muslim majority population ruled by Maharaja Hari Singh who annexed with India to receive military assistance (Schofield, 2010). The local opposition for freedom and some armed groups those entered from Pakistan to help Kashmir's liberation stood against Maharaja's rule. India waged a war as soon as the annexation was signed. India took Kashmir issue to United Nations when nearing its military defeat. UN advised to hold a plebiscite in Kashmir but this never happened. In 1965 India's Operation Dessert Hawk cause skirmishes between India and Pakistan, Pakistan planned Operation Gibralter in which forces swept into Kashmir to help freedom fighter, it turned into a full scale war when India attacked Pakistan's border from Kashmir to Karachi (Lyon, 2008). In 1965 war Kashmir was a core issue but Tashkent Agreement at the end of war didn't provide a solution to Kashmir issue; while Simla Accord after 1971 war declared the ceasefire line as Line of Control between Pakistan and India, it was an attempt to freeze Kashmir issue for undefined period (Pattanaik, 2019). The war of 1971 was severe setback when Pakistan lost its Eastern wing on Indian intervention to East Pakistan. During the civil rebellion in East Pakistan after 1970 elections India took advantage of deteriorating situation by militarizing and training guerrilla fighters in East Pakistan (Bass, 2013). Disguised as humanitarian intervention India entered its troops to East Pakistan where Pakistan army surrendered to Indian army.

In 1984 India attempted to capture the Siachen glaciers, Pakistan also mobilized its forces to stop Indian advances. Since then it is the highest battlefield in world. A ceasefire was reached on Siachen in 2003, but the conflict wasn't resolved. Since 1950 in wake of escalated tensions between rival states, India has time and again threatened to cut the flow of rivers from Indian held Kashmir and Punjab, to Pakistan. The water of Indus was divided between Pakistan and India in Indus Waters Treaty 1960 under the auspices of World Bank (Sandeep, Amanpreet, & Amandeep, 2015). India PM threatened to block water flow to Pakistan after Uri attacks and in a public address for election campaign in Haryana 2019; the suggestion for a water blockade also rose after Phulwama attack 2019 (Dutta, 2019).

a. Strategic culture

Strategic culture of a state identifies its choices for future behavior in light of its aspirations and experiences with other states. Strategic culture of Pakistan and India manifest their national believes, self-perception and source of threats to their national integrity which eventually reflects in their military preparedness and arms procurement.

4.2.1 Strategic culture of Pakistan

Strategic culture of Pakistan has an undeniable impact of its experience and security concerns from India. A senior defence analyst, Feroz Hasan Khan, lists the ingredients of Pakistan's strategic culture; It has a perception of self, its adversary, a

clear tint of history, its experience with allies and at its core rests its nuclear weapon, he further comments, Pakistan's military and population takes pride in their history, they accept their mistakes, continuously built and rebuilt their self-image and elevate their pride with achievements (Khan, 2005). Pakistan's security concerns from India are not baseless, Pakistan utilizes all possible means to protect itself from Indian aggression and maintain its position in regional and international politics. Christine Fair in her report mocks over Pakistan's India centric security perception. According to the biased report, Pakistan strategic culture is based on the assumptions such as Pakistan's security establishment regards partition plan of Indian sub-continent as an insecure and incomplete division, secondly Pakistan is threatened by Indian hegemony and oppose it; that is natural for India in Fair's view, and finally, Indian ambitions for United India and rejection of two nation theory instil fear of aggression for Pakistan (Fair, 2016). Pakistan's geographical position and history reinforces these suspicions. Indian aspirations to lead South Asia undermine Pakistan's interest. Pakistan cannot align its interests with Indian dictation, Pakistan being an independent and sovereign state, will keep its integrity and will not bend or leave its rightful position to satisfy Indian hegemonic aspiration and will continue to seek a peaceful resolution to all unresolved issues. Indian longing to inflict harm on Pakistan has remained unchanged after 73 years of partition. The tragedy of East wing's separation was celebrated by India as death to two nation theory (Bass, 2013). In order to make its defence strong Pakistan had to make a nuclear weapon because memory of 1971 debacle was fresh in minds of security establishment, India had conducted nuclear test 1974, moreover there was sharp conventional force asymmetry between Pakistan and India and Pakistan could not rely on biological or chemical weapons to fulfill its security needs (Khan, 2005).

4.2.2 Indian strategic culture

Indian strategic culture is a combination of old Hindu traditions and modern state's needs. Partition of subcontinent gave a blow to Indian dreams of Akhand Bharat, the strategic culture for India after partition was based on Nehruvism, Hindu Nationalism and Real Politik (Hall, 2016). Nehruivism guided India to adopt non alignment, civilian supremacy, diplomacy on international issues and it made India reject any external meddling in her affairs. The second and most important influence on Indian Strategic culture is Arthashastra an ancient sacred Hindu text, it contributes the strategic culture by defining enemy. A natural enemy to a state is the one who prepares to outmanoeuvre king and attacks if not pre-empted and one cannot make pace with natural enemy (Kamal, 2018). An alien, an outside force or a natural enemy according to text can be an immediate neighbour of a state which aims to capture territory and overshadow civilization. The text identifies states with shared borders as enemies (Safdar & Mushtaq, 2019). In Indian

history Muslim armies invaded India and rule over Subcontinent (Jones, 2006). Islam emerged as a religious, civilizational and political challenge to Indian strategists in form of Two Nation Theory and later formation of Pakistan. Pakistan neighbors India, rejects Indian domination and prepares for its defense; thus fulfill the preconditions for external foe. Indian Strategic culture doesn't clearly pronounce enemies. India regrets the development and acquisition of fatal weapons, it calls for universal disarmament. Nuclear weapon is portrayed as regretful acquisition to deter external enemy.

Arthashastra also provides a foreign policy orientation which aims at conquest in form of territorial expansion to enhance regional influence (Safdar & Mushtaq, 2019). Modern India creates a self-image of regional hegemon in South Asia and Indian Ocean Region; Gujral Doctrine gave words to Indian aspirations when demanded regional states to align their policies with India and accept its dominance, India rejects any external involvement in region stressing on bilateral resolution of conflicts with states. Pakistan rejects these Indian hegemonic designs, Indian Strategic culture confirms that Pakistan's security concerns are not baseless.

4.3 Post nuclear test relations

The relations between Pakistan and India after nuclear tests have experienced ups and downs, although they refrained from total war, the conflicts and clashes continued. After nuclear tests Prime ministers of Pakistan and India met in Lahore in February 1999 to normalize relationship, it was a successful visit where Lahore Declaration was signed. It seemed like a milestone achievement when several nuclear CBM's and resolving Kashmir issue by given right of Self-determination was agreed (Kumar, 2014) The peace effort were sabotaged when Pakistani backed militant infiltrated in Kargil and occupied important positions in area. India launched a military operation to fight these militants, tension escalated as India mobilized its troops in other areas signalling a war. For two decades, bilateral tensions have continued, India accused Pakistan for sponsoring terrorism whether it were Indian parliament attacks, Mumbai attacks, Pathankot attack, Uri attack or Phulwama attack. The lack of trust and cooperation in India Pakistan missed the opportunity to adopt peace in Agra Summit and Indian non-cooperation on President Musharraf's proposals for resolving Kashmir issue. India has financed and supported terrorists, banned outfits, separatists, and fuelled insurgencies in Pakistan which were confirmed in confession of Indian spy Kulbhushan (Hashim, 2014). After Kargil 1999 India and Pakistan have refrained from war, a nuclear war is neither feasible nor desirable.

5. Nuclear arms race in South Asia

The nuclear arms race between Pakistan and India manifest the action reaction dynamics where both states have matched or tried to combat rival with their doctrines, policies and both qualitative and quantitative arms developments. Nuclear weapon acts as a decisive weapon system in Indo Pak arms

race. India started developing its nuclear weapon to address its security needs against China, and Pakistan did so to match India. Indian nuclear weapon holds a political value beside a deterrent to external enemies; Indian ambitions to lead South Asia and secure a permanent seat in UNSC required strong defense. Pakistan nuclear weapon and missile program was a reaction to Indian programs. Pakistan's dismemberment and Indian Peaceful Nuclear Explosion 1974 became the triggering cause of Pakistan's nuclear program. Then Prime Minister Mr. Zulfiqar Ali Bhutto is credited for myth making on nuclear security, it was gradually accepted by all state institutions; the value of nuclear weapon was so firmly founded that no civilian or military leader reversed Pakistan's nuclear program (Lavoy, 2006). The decision to test nuclear weapon in 1998 observed same reactive pattern; neglecting international pressures and its fragile economy Pakistan focused on its security needs against India. Pakistan had nuclear weapon capabilities during 1990's but it refrained from testing; May 1998 tests in response to Indian tests were a political move to showcase its strength and establish nuclear deterrence in South Asia (Eklind, 2015).

5.1 Nuclear Doctrines and Policies in South Asia

Pakistan and India's nuclear doctrine and policies are important to study in order to understand their nuclear programs and plans as well as to establish a reactive pattern in policies and force postures. At first, Draft Nuclear Doctrine (DND) 1999 and later Revised Nuclear Doctrine 2003 announced Indian nuclear doctrine and policy. Pakistan doesn't have a written documented nuclear doctrine. The threshold for nuclear use, Pakistan's nuclear policy and related doctrinal information is a collection of interviews of chief personnel, ground realities and force posture of military accounts as a tentative nuclear doctrine. A credible source to describe Pakistan's nuclear policy is Gen. Kidwai's interview stating that Pakistan will use its nuclear weapon if its existence is at stake and it is a deterrent against India. He describes four situations that loosely define the Pakistan's nuclear threshold that are, in case India attacks and surmount Pakistan's large territory, India destroy large portion of Pakistan's land or air forces, India causes economic strangling for Pakistan, and India pushes political destabilization or blazes internal rebellion in Pakistan (Lavoy, 2009). Pakistan's nuclear policy demands the ability to deter political or military coercive Indian behavior to ensure its integrity and sovereignty. Pakistan respects nuclear free zones and advocates for a nuclear weapon free South Asia, it has also called for a regional restraint regime which assures credible deterrence at minimum level. Pakistan opposes induction of Anti-ballistic missile systems and submarine launched ballistic missiles in South Asia (Nasreen, 2017).

Table 2: The Nuclear Doctrine and Policy of India and Pakistan

Indian Nuclear Doctrine	Pakistan's Nuclear Policy
•No First Use •Minimum credible deterrence based on land-, sea- and air-based capabilities •India will observe nuclear test moratorium but refuses to sign CTBT. •India's R&D will remain unrestricted whil India continues to support global disarmament and arms control •No use against non-nuclear states retains an option of using nuclear weapon if attacked by nuclear, biological or chemical weapons on its territory and if its forces are attacked anywhere in the world •India will participate in FMCT negotiations & observe export controls •Retaliation requires NCA's permission (Civilian political leadership)	•First Use •Minimum credible deterrence to put off Indian aggression; delivery apparatus for nuclear weapon relies on air and land based missile capabilities •Observes nuclear test moratorium, refuses to sign CTBT unless India does •Asks for regional non proliferation solution •Opposes discriminatory nuclear non-proliferation regimes •Vows to strengthen export controls and vetoed FMCT. •Maintains an effective C4I2SR network; nuclear use require permission from NCA

Sources: For Indian nuclear doctrine (Chari, 2000) (Shankar & Paul, 2016), for Pakistan's nuclear policy (Nasreen, 2017) (Aguilar, Bell, Black, Falk, Rogers, & Peritz, 2011)

6. Missile capabilities and arms modernization trends in South Asia

Designing a reliable, accurate and precision based delivery system is next to developing a nuclear weapon. Pakistan and India have developed reliable air based and land launched missiles and continues to work on Submarine launched and sea based assets. The missile modernization validates that Minimum Credible capabilities are not observed in true spirit in South Asia. Huntington mentioned the quantitative and qualitative advancements as a key feature of arms races; Indo-Pak missile programs make qualitative adjustments and that responds to rival's capabilities. India sets the trend by acquiring advance missile capabilities and Pakistan follows such developments by improving its capabilities (Jalil, 2017). Pakistan cannot isolate itself from regional and global security issues; it has to maintain the balance of power with India. India's initiatives like Cold Start Doctrine and Ballistic Missile Defence program disturbs the deterrence stability in South Asia. To re-establish equilibrium in South Asia and ensure its security, Pakistan developed Tactical Nuclear Weapons, and developing MIRV's and assured second strike capability. A report submitted to United States' Senate Select Committee on Intelligence 'Statement for the record Worldwide Threat Assessment of the

US Intelligence Community' has shown concern over global nuclear arms modernization, its impact on escalation dynamics and security in South Asia. The innovations in nuclear weapons, Tactical Nuclear Weapons, Air launched and Sea based Cruise Missiles and Long Range Ballistic Missiles developments by Pakistan and India's nuclear powered, nuclear armed submarines increases the risks of nuclear security incidents (Coats. 2019). To study the qualitative modernization of Pakistan and India's nuclear capabilities a brief account of their programs is as follow

6.1 Ballistic Missile Programs

Ballistic Missile is considered as reliable delivery option for conventional and nuclear warheads. Pakistan developed ballistic missiles primarily by keeping India in her target liaison. Abdali (Hatf-2) and Ghaznavi (Hatf-3) are short range missiles with range of 200km and 300km respectively (Kristensen, Norris, & Diamond, 2018). Ghauri (Hatf-5) estimated range 1000-1500km and Ghauri II estimated range of 2500 is under-development (Dhanda, 2011). Shaheen series with approximate range 500-2000km has brought major Indian cities in target liaison (Narang, 2012). India has four kinds of land based ballistic missile systems, Short Range Agni-I and Prithvi-II, Medium Range Agni-II, Intermediate Range Agni-III are part of operational nuclear force while Long Range Agni-IV and Agni-V are under user trials. The Short and Medium Range missiles Prithvi-II, Agni-I and Agni-II were made to attack Pakistan from land. Agni-III, Agni-IV and Agni-V were designed to cover China's major centers. Agni-IV is in development phase, it aims to take nuclear warheads to major Chinese cities (Shaikh, 2018). Agni-V is believed to be an ICBM however official sources regard it as Intermediate Range Ballistic Missile, it is under testing with approximate range of 6000-700km. Reports suggest India has designed a MIRV launcher for Agni-V (Gady, 2018).

6.2 Aircraft Carriers

Pakistan and India have relied on aircraft carriers for nuclear and conventional weapons before the production of land based ballistic missiles. Indian air-based nuclear force had Mirage 2000H and Jaguar IS/IB aircrafts. The qualitative improvements like Mirage 2000H to Mirage 2000I and up gradation of Jaguar fleet through precision attack and avionics upgrade are reported (Kristensen & Korda, 2018). India is further modernized its air capabilities by purchasing 36 modern fighter bomber aircrafts 'Raafale' from France. First Rafale, a multirole generation plan was scheduled to join IAF in September 2019 (Zaafir, 2019). Five Rafale fighter aircrafts joined Indian Air Force in July 2020; these comprehensive combat aircrafts need relatively less repairs and designed specifically to suit Indian needs (Pant & Singh, 2020).

Pakistan has three aircraft carrier options F-16 A/B & S/D, Mirage III & V and JF-17. F-16 A/B has a range of 1600 km and can carry a nuclear weapon. Mirage III and Mirage V are capable of carrying nuclear weapon; Mirage III was used in test launch of Raad. The plan for equipping JF-17 to carry nuclear weapon is reported but it is quite uncertain

(Kristensen, Norris & Diamond, 2018).

6.3 Ballistic Missile Defense (BMD)

Establishing Ballistic Missile Defense was a part of Indian nuclear program, Indian nuclear force posture declared in 2003 had mentioned integration of Ballistic Missile Defense to support India's No First Use policy. India BMD shield aims protect from offensive missile attacks from China and Pakistan, threat of nuclear terrorism; it was developed to serve the bureaucratic interests of Indian DRDO and US' interests in extending support to Indian BMD, India also justifies its acquisition of BMD by indicating Chinese ASAT test 2009 as a security threat (Rajagopalan, 2017). Whatsoever reasons India has for missile defense shield, such a development creates a strategic drift and blazes nuclear arms race in South Asia. It challenges the credibility of Pakistan's deterrence force and encourages Pakistan to take counterforce measures (Khan, 2017). Pakistan's former Army Chief, Mr. Kayani said that Pakistan adopt its security parameters keeping in view adversaries' capabilities, not his intensions (Aguilar el at, 2011). Indian Ballistic Missile Defense is designed in two phases. The first one is to destroy incoming ballistic missiles in two layers through Prithvi Air Defense (PAD) and Advanced Air Defense (AAD), while the second one will comprise of AD-1 and AD-2 ballistic missiles to intercept incoming IRBM's and ICBM's. Indian BMD is capable of intercepting one ballistic missile at a time; India DRDO plans to extend its range for engaging target from 2000km to 5000 km and increasing its capabilities to intercept multiple targets in future (Rajagopalan, 2017). Indian BMD has swordfish radar system capable of detecting around 200 objects between 600 to 800 km's and is expected to increase this range (Jalil, 2017).

6.4 MIRV's

Keeping in view the specifications of Indian Ballistic Missile Defense, Pakistan is compelled to develop missiles that can pass through Indian missile defense shield. The production of MIRV's and Cruise Missiles, and expansion of nuclear arsenal by Pakistan in response to Indian BMD indicates that Indian BMD is one of the reasons for Pakistan to make these advancements (Rajagopalan, 2017). India's DRDO has plan of making variants for Agni V, one capable of integrating MIRV's, another to launch military satellites and one for Anti Satellite System (O'Donnell & Pant, 2014). Previously, DG DRDO had claimed that India will be able to deploy MIRV's with Agni-III and Agni-V but MIRV's deployment was not the part of Government of India's nuclear policy (Narang, 2012). However the Chinese decision to deploy some of its ICBM on MIRV's and Pakistan's test launch of ICBM Ababeel with MIRV in January 2017 will provide a reason to the advocates for development of MIRV's in India (Kristensen & Korda, 2018).

6.5 Cruise Missile Program

Pakistan has Babar (Hatf-7) mobile Ground Launched Cruise Missile and Ra'ad (Hatf-8) an Air Launched Cruise Missile in its cruise missile inventory, both capable of carrying conventional

and nuclear warheads at supersonic speed. Babur has estimated range of 750 km with 20-25 meters circular error probability; its naval version is under development, once operational it will strengthen Pakistan's sea-based nuclear assets. Raad has a range of 350 km to attack fixed targets and capable of penetrating Air Defence system. It was test fired from Mirage III and is expected modification to be loaded on JF-17 in future (Calvo, 2016). India is leading cruise missile race in South Asia with BrahMos and Nirbhay and seeks hypersonic versions of these missiles. BrahMos is operational and can be launched from land, air and naval platforms (Narang, 2012).

6.6 Tactical Nuclear Weapons (TNW)

Pakistan is revising its force structure by inducting tactical weapons, developing MIRV's and sea based assets in response to Cold Start doctrine and Indian arms modernization. Pakistan's miniaturized nuclear weapons known as Battlefield or Tactical Nuclear Weapon, Nasr (Hatf-9) with range of 90 km, it has in-flight manoeuvre capability. It takes little time to mobilize and has been specifically designed to deter Indian conventional aggression (Calvo, 2016). For Pakistan, TNW is a weapon of last resort if its conventional force fails to retaliate enemy; it comes first in case of nuclear use option (Mishra & Ahmed, 2014). Indian Strategic Force Command has denied intension to make a tactical nuclear weapon but DRDO had indicated that Prahaar's development (Narang, 2012). Pakistan's tactical weapon are criticized by experts as they lower the nuclear threshold, it need a reliable management and controlled for safety and prevention from accidents. Pakistan maintains that these weapons will not be used unless National Command Authority approves.

6.7 Assured Second Strike and Nuclear Triad

Developing a nuclear triad has been a part of Indian nuclear policy and India achieved this capability with INS Arthant. It is a 6000 ton submarine equipped with K-15 nuclear ballistic missile with range of 750 km and takes a month deployment time. India is designing a K-4 3500 km range missile to ensure the security of its submarine. Another SSBN, INS Arighat has completed sea trails, two more boats are expected to commission Indian force by 2023 (Simha, 2018). Pakistan's quest of survivability of nuclear force and assured second strike capability led to development of Babar-III a Submarine Launched Cruise Missile (SLCM) in 2017 with a range of 450km it reportedly has MIRV capability too ("India tests 'K-4 SLBM'", 2020).

6.8 Action Reaction dynamics in South Asia

The details of arms modernization illustrate the action reaction dynamics in South Asia. The minimum for both Pakistan and India cannot be defined when their desire for advanced nuclear capabilities continues; with every new weapon considered ultimate and decisive weapon the competition continues. India's nuclear journey started from denying and opposing nuclear weapons, it reached the point where India kept a ready arsenal and operational nuclear force. Then, India designed a quick response force (Cold Start

doctrine), its nuclear policy rolls between no first use, punitive strike and capability to fight a nuclear war (Iqbal, 2016). Pakistan being forced to opt the nuclear path and has continued to protect its sovereignty by employing all possible means. In 2010, Pakistan's Joint Chief of Staff Committee, General Tariq Majid keeping in view the massive Indian conventional and nuclear force built up, Cold Start doctrine, assertive posture, alarming notion of two front war and Indo-US nuclear deal said that maintaining necessary nuclear force for credible minimum deterrence against any possible aggression in not a matter of choice for Pakistan but a compulsion (Eklind, 2015).

7. Conclusion

The Indo-Pak nuclear arms race has followed the reactionary pattern. It validates the key assumptions made in Huntington's action-reaction model. The core reason of mutual fear and suspicions is evident from historical experience, unresolved and long standing issues which show no progress towards resolution. These fears are reinforced by the history of conventional wars and aggressions in 1948, 1965, 1971 and 1999. The change of self-perception as proposed by Huntington give flames to arms race, thus Indian evolving self-perception and aspirations for regional hegemony and achieving higher political status in global politics disturbs the power equilibrium in South Asia forcing Pakistan to compete. Indian strategic culture also regretfully absorbs all the destructive means of power projection which provokes an Indian centric security conscious in minds of Pakistan's elite. Pakistan in turn relies on prowess of its nuclear capabilities. Indo-Pak nuclear doctrine and policies also address their aspirations and security needs. The nuclear equilibrium between India and Pakistan is being maintained by making qualitative improvements in nuclear arsenals. In the beginning both states developed identical weapons, ballistic missiles to deter each other by attaining suitable ranges to reach most of adversary's territory. Now they have entered the modernization phase their forces are upgrading to newer technical specifications to ensure reliability and survivability. Pakistan and India are developing combat weapon systems i.e. Indian BMD verses Pakistan's MIRV's and Cruise missile. The assured second strike capability and completion of nuclear triad is also being actively pursued. The action reaction model predicts that time provides psychological soothing and lessens inclination towards war; Indo-Pak arms race has so far contributed peace.

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