The Trilateral Nuclear Dynamics in South Asia

Francisco Galamas

WMD nonproliferation researcher at the National Defense Institute (IDN), Lisbon, Portugal. He is also a member of the Young Atlanticist NATO Working Group of the U.S. Atlantic Council as well as of the George C. Marshall European Center for Security Studies.

Abstract

When addressing nuclear issues in South Asia, most scholars focus solely on India and Pakistan. Although we should acquiesce that the problematic diplomatic ties between Islamabad and New Delhi includes a nuclear dimension, facts demonstrate that China has a paramount role in the regional nuclear dynamics. In order to understand these dynamics, the article analyses the historical background of the nuclear weapons programs and the strategic imperatives which underlined their origins. Subsequently it shows how they influence each other, constituting a trilateral nuclear dynamic with risks to the regional stability brought under an "action-reaction" cycle.

Resumo

A Dinâmica Nuclear Trilateral no Sul da Ásia

Quando se abordam as questões nucleares no Sul da Ásia, a maioria dos investigadores tem a tendência para se focar somente na Índia e no Paquistão. Apesar de termos que reconhecer que os laços diplomáticos conturbados entre Islamabad e Nova Deli incluem uma problemática dimensão nuclear, factos demonstram que a China tem um papel central nesta dinâmica nuclear regional. De forma a compreender as dinâmicas nucleares entre estes três países, o artigo começa por abordar o enquadramento histórico destes programas de armas nucleares e os imperativos estratégicos subjacentes às suas origens. De seguida analisar-se-á a forma como estes programas se influenciam, formando uma dinâmica nuclear trilateral, com riscos para a estabilidade regional advindos deste ciclo de "ação-reação".

"I'm not afraid of nuclear war." (Mao Zedong, 1965)

"As long as the world is constituted as it is, every country will have to devise and use the latest scientific devices for its protection. I hope Indian scientists will use atomic power for constructive purposes. But if India is threatened, she will inevitably try to defend herself by all means at her disposal." (Jawaharlal Nehru, 1946, quoted in Udgaonkar, 1999: 154)

"If India builds the bomb, we will eat grass or leaves, even go hungry, but we will get one of our own." (Ali Bhutto, 1965, quoted in Pillalamarri, 2015)

Most of the nuclear weapons research on Asia revolves around countries such as North Korea, Russia, China, India and Pakistan. Although the latent turmoil that persists in South Asia generally embeds the already mentioned countries of this subcontinent, a more insightful analysis on the regional nuclear dynamics reveals that it involves additional countries. This article shows that the nuclear dynamics in the South Asian region directly involves not only India and Pakistan but also China's nuclear weapons developments.

We start by making a brief historical account on nuclear weapons developments made by the three countries in order to understand the origins and strategic drivers behind it. By adopting this historical perspective it will be possible to understand the impact that nuclear weapons programs had in exacerbating the already present regional security dilemmas.

Subsequently the article focus on how the nuclear weapons programs – and its delivery platforms – of China, India and Pakistan impact each other, thus forming the South Asian trilateral nuclear dynamic. Finally, after addressing the "action-reaction" cycle that characterizes this dynamic, we point out some potential nuclear stability risks that need to be addressed in order to prevent an increase in the regional instability.

Historical Background of the Trilateral Nuclear Dynamics in South Asia

China

The inception of the Chinese nuclear program can be traced to the 50's decade mostly due to the 1954-55 skirmish between the United States (US) and China over two strategically important islands in the Taiwan Strait. Additionally, another reason behind this weapons program was the Chinese leadership preoccupation regarding a hypothetical nuclear attack by the US at the end of the Korean War (Sagan, 1996: 58-59). While understanding how difficult it would be to offset the US nuclear forces, the Chinese President Mao Zedong, in the beginning of 1955,

authorized the initial development of a nuclear weapons program. As the US placed nuclear weapons in Taiwan and another Taiwan Strait crisis arose, the Chinese leadership decided to create the Beijing Nuclear Weapons Research Institute (later known as the Ninth Academy) and build uranium enrichment facilities throughout the country in 1958.

Two years later, work began on the construction of a plutonium production reactor, at the Jiuquan Atomic Energy Complex, and a nuclear test site in western China. While the Soviet Union gave initial support for a plutonium production facility, the assistance was terminated in 1959 without the transfer of any sensitive technology (Burr and Richelson, 2000: 57-58). The ideological animosity between the Soviet Union and China and their border confrontations "exposed the limited value of China's conventional deterrent" gave the final incentive for the Chinese development of a nuclear arsenal (Sagan, 1996: 59; National Intelligence Estimate number 11: 13-69). Years later, the continuing growth of the Sino-Soviet tensions led the communist superpower to consider a preemptive attack on the Chinese nuclear facilities (US State Department, 1969).

On the 16th of October 1964, China detonated its first nuclear engine based on highly-enriched uranium (HEU) with a 12-22 Kilotons (Kt) yield. Surprisingly, only three years after its first nuclear test, the Chinese authorities were able to test its first thermonuclear bomb with 3.3 Megatons (Mt) yield.[1] Over the next three decades, unlike other nuclear weapons states, China's evolution of its nuclear arsenal was gradual and slow which made it systematically vulnerable to opponents. Authors provide two different explanations for this extended vulnerability. One of the explanations is based on ideology. Both Mao Zedong and Deng Xiaoping believed that the sole purpose of nuclear weapons was to prevent nuclear aggression and coercion. In order to achieve that, the nuclear arsenal would be solely based on the ability to retaliate an initial nuclear strike and impose unacceptable damage. A second explanation for the slow development of the Chinese nuclear arsenal lies on the political and technical restrictions that prevented the further improvement of these weapons and their delivery systems.

Regardless of the reasons for the vulnerability of the Chinese nuclear arsenal, since its inception it had a specific trait, namely its small size and vulnerability. In 1985, Beijing had around 151 nuclear warheads which was about half of the French and the United Kingdom nuclear arsenal. Moreover, the nuclear ballistic missiles just had intermediate and medium range, which prevented China from reaching the full extent of the Soviet Union's and the US' territory. In terms of vulnerability, although nuclear capable, these missiles' propulsion relied on liquid fuel which

1 One kiloton (Kt) is equivalent to one thousand tons of TNT and one megaton (Mt) is equivalent to one million tons of TNT.

requires several hours of preparation making them vulnerable to a first strike. It was only during the 80's that China was able to develop an intercontinental ballistic missile (ICBM), the DF-5 (Lewis and Di, 1992: 18-19). Nevertheless, the DF-5 was silo-based and had intricate operational requirements that undermined a second strike capability. Still, if Chinese nuclear land capabilities presented some shortcomings, the maritime and air dimensions of the nuclear triad present additional limitations to the military leadership (Manning *et al*., 2000: 18).

In 1964, when China developed nuclear devices, even without a declaratory strategy or operational doctrine, its leadership defined two policies that would serve as guidelines for its nuclear weapons. The first is the "No-First Use" (NFU) policy. Under this policy China pledges to other nuclear powers that will not use nuclear weapons unless it is firstly attacked by the opponent's nuclear forces. Another nuclear policy advocated by China is the opposition to a nuclear arms race. The main idea behind these policies is that China's nuclear posture is not based on equivalence but on retaliation capability (also known as second strike). Even without an official nuclear strategy, it is possible to still see the influence of Mao Zedong and Deng Xiaoping during the first few decades of the Chinese nuclear policies. Only in a 2006 Defense White Paper, and for the first time, did China clearly state its official nuclear strategy.[2] Although named as "Self-Defense Nuclear Strategy", its two guiding principles ("counterattack in self-defense" and "limited development of nuclear weapons") are still based on the NFU and the "opposition to nuclear arms race" policies defined decades earlier. It should also be noted that in 2000, the Chinese strategic forces had already developed some military theory for nuclear operations, namely nuclear counterstrike campaigns and the central role of survivability of the nuclear weapons forces (including mobility and concealment). Nevertheless, these does little to alter the core of the Chinese nuclear strategy – the deterrence of nuclear weapons attack – which relies on the second strike capability. This raises an interesting point. While some authors defend that China has a credible minimum deterrence, others disagree as China's nuclear strategy is not uniquely focused on counter-value strikes and on a specific number of weapons, traditional signs of this minimum deterrence policy (Fravel and Medeiros, 2010: 48-79). Likewise, some accounts report that around a third of the Chinese nuclear arsenal has tactical yield weapons (Manning *et al*., 2000: 17).

India

The Indian quest for nuclear deterrence represents one of the most complex, although interesting, pathways towards nuclear weapons development. Unlike

2 The Chinese Defense White Paper of 2006, is available at http://fas.org/nuke/guide/china/doctrine/wp2006.html.

most nuclear powers that planed nuclear tests as a preliminary step to develop their strategic arsenal, India's development of nuclear weapons had two distinctive phases. A first phase with the sole purpose of having a nuclear program without contemplating the option of nuclear weapons development and a second phase where the Indian leadership clearly decided to achieve a nuclear deterrence capability.

As mentioned, India initiated its nuclear journey by developing a civilian nuclear energy program, namely by commencing a nuclear physics research program in 1945 at the Tata Institute of Fundamental Research (TIFR). A couple of years later this research got further support by India's first Prime Minister Jawaharlal Nehru who saw in the civilian nuclear infrastructure an instrument to improve Indian economic self-reliance and eradicate poverty. Nevertheless, Prime Minister Nehru publicly disagreed with both the production and the use of nuclear weapons in international politics, a likely sign of the influence of Gandhi's non-violent conflict resolution beliefs in Indian political decision-makers.

In 1956, India built its first nuclear infrastructure, the Apsara nuclear light-water reactor, with the assistance of the United Kingdom that also supplied 80% of the enriched uranium (Nuclear Threat Initiative, 2003). Four years later, New Delhi began to operate a CIRUS nuclear heavy-water reactor built with the support of the US and Canada as the Indian authorities vowed to both countries that the reactor, and its plutonium, would be solely used for peaceful purposes (Nuclear Threat Initiative, 2003). This particular reactor had a nine to ten kilogram plutonium output per year, enough to produce one to two nuclear fission devices per year.

Although with access to plutonium, and consequently the ability to manufacture a nuclear weapon, India refrained – for 14 years – from performing its first nuclear test. Such prolonged chronological intermission raises questions on the major factors behind the decision to carry out a nuclear test more than a decade later. The Chinese factor proved to be a major influence in this particular aspect. More specifically, the direct influence of China on India's policy-makers can be traced to two important events. The first one occurred in 1962, when India and China were involved in a border conflict which led to a Chinese incursion on Indian territory thus creating what currently remains the biggest border disputed area in the world, comprising over three thousand kilometers. As China advanced and occupied Indian controlled areas, a growing sentiment of insecurity began to rise among India's policy-making circles. Furthermore, politicians from the North of India as well as some Indian nuclear scientists began to defend the necessity of performing a nuclear test in order to deter China's armed forces from further territorial incursions. As previously mentioned, Gandhi's principle of non-violence and international cooperation had a profound influence over the Indian National Congress Party which later decided to refrain from performing any nuclear test. The decision

was based on the belief that by not carrying out a nuclear explosion, India would maintain a moral superiority vis-à-vis China (Izuyama and Ogawa, 2003: 60-61).
Two years later, a second Chinese related event had a significant impact on Indian strategic circles, namely the 1964 nuclear test. Since 1960 that Indian policy-makers were anticipating the Chinese nuclear test but got increasingly worried as this proved to be a massive advantage for the People's Liberation Army (PLA) in a time when India was investing significantly on conventional weaponry following its 1962 military defeat (Kennedy, 2011: 124-125).
Still, Prime Minister Nehru maintained his strong opposition to nuclear weapons albeit months later, after his death, the new Prime Minister Lal Shastri decided to pursue a different strategy: assure nuclear protection from nuclear powers. Although easier than developing nuclear weapons, some Indian politicians feared that such decision could compromise India's international non-alignment posture. In this particular aspect, the Indo-Pakistani war of 1965 proved to be pivotal. As this border dispute erupted, China supported Islamabad and threatened to open a second war front against India in the Himalayan border. Once again pressure mounted against the Indian Prime Minister in order to develop nuclear weaponry leading to a minor change in India's nuclear options. According to Prime Minister Shastri, if China developed enhanced nuclear delivery systems, India would revise its nuclear options. Faced with the possibility of a two front war against its main regional opponents, India – now under the leadership of a new Prime Minister, Indira Gandhi – begun to procure nuclear assurances from either the US or Soviet Union against an hypothetical Chinese attack (Mohan, 1998: 378).
Indian efforts proved to be unsuccessful as both countries failed to provide the explicit guarantees sought by India. Years later, in 1969, as the relationship between China and Soviet Union deteriorated further, the latter begun to approach India with the intent to create a collective security system in Asia to counterbalance China. Although initially uninterested, New Delhi later accepted to debate the idea as soon as the Soviet Union offered to cease military assistance to Pakistan. In 1971, the Indo–Soviet Treaty of Peace, Friendship and Cooperation was signed mostly due to the war in East Pakistan (presently Bangladesh) and the improved US-China diplomatic ties. This last aspect was particularly concerning to India, as the US Secretary of State admitted to the Indian ambassador in Washington that his country would not help India against China in case New Delhi took military action against Pakistan (Kennedy, 2011: 135-136).
Other strategic decision made at the time by Indian policy-makers entailed the support of international disarmament agenda which ultimately impacted the option of performing a nuclear test. In order to follow upon this particular diplomatic agenda, India initially supported the negotiations of the Nuclear Nonproliferation Treaty (NPT) but failed in the purpose of including "nuclear peaceful explosions"

for non-nuclear States in the draft text of the Treaty. Other purposes envisioned by India for this Treaty also proved to be unsuccessful. For example, achieving an adequate balance between non-nuclear and nuclear powers, namely in terms of access to civilian nuclear technology as well as the adoption of a nuclear nonproliferation policy as a core pillar of this Treaty with the final purpose of universal nuclear disarmament, specifically for nuclear powers. Furthermore, after failing to assure the previously mentioned nuclear protection from both superpowers, India adopted a less active posture in the negotiations. Finally, in 1968, when the US, Soviet Union and the United Kingdom signed the NPT, India chose not to do so for two specific reasons. Firstly, China became a NPT recognized nuclear State and secondly, the Treaty sought to maintain the non-nuclear weapons status of states without reciprocal nuclear disarmament obligations from nuclear weapons states. Unlike in the past, this decision was less based on moral grounds but more on strategic imperatives that required India to maintain its nuclear weapons option available (Ganguly, 1999: 152-158).

The Indo-Pakistani War of 1971 was another important factor behind India's decision to carry out a nuclear test. Even though India came victorious from this confrontation with Pakistan, for the first time in its history it felt the direct pressure from a nuclear weapons State, namely when the USS Enterprise aircraft carrier entered the Bay of Bengal to compel India into accepting a cease-fire that clearly benefited Pakistan. Ultimately that bluntly demonstrated to India the coercive power present in the mere possession of nuclear weapons and its strategic impact (Ghose, 1997: 242-243).

As New Delhi's leadership begun to realize that the major powers will not properly assuage the Indian security needs and witnesses the increase in Chinese nuclear capabilities, in 1971 the decision is made to perform a nuclear test. Due to domestic political reasons, the test was delayed for three years and, in May of 1974, a 15 Kt nuclear fission device was detonated in what was described as a "peaceful nuclear explosion". The test itself was not only a way to prove the international community that India had the ability to develop a nuclear engine but also as a political independence demonstration towards great powers namely the Soviet Union (Kennedy, 2011: 140). Consequently, Canada and the US issued strong criticism against this test and ceased any nuclear cooperation with India. China and Soviet Union followed suit and voiced their disagreement against the Indian nuclear test. Without external support India was left with no other choice than to develop a self-sufficient domestic nuclear program (Ganguly, 1999: 160).

At this stage it is important to bear in mind that detonating a nuclear engine and possessing a nuclear weapon are two distinct technical achievements. In 1974, while India successfully achieved the former it was still far from developing the latter. Nevertheless, unlike other countries, after the nuclear test, India did not

immediately pursue a nuclear weapons capability. Instead it claimed that it had no desire to develop nuclear weapons and kept the option open, which became known as the "option policy" (Izuyama and Ogawa, 2003: 61).

Before New Delhi decided to enter on the second phase of its nuclear endeavors and initiate its weapons development, Indian policy-makers decided to suspend any progresses in this field. Different reasons explain why it took so much time to begin building its nuclear arsenal. Besides international pressure, domestic reactions after the 1974 nuclear test were among some of the reasons behind such delay. Due to domestic political turmoil, Indira Gandhi had lost the elections and Morarji Desai replaced her. The new Indian leader opposes nuclear weapons on moral grounds and suspends any efforts linked to its development (Latif, 2014: 133). Notwithstanding the aversion towards nuclear weapons present in some Indian political circles, high costs behind the development of these weapons were factors important for Indian decision-makers.

The enhancement of the Indo-Soviet ties was also a pivotal factor behind the decision to postpone the development of a nuclear arsenal. As the Soviet Union invaded Afghanistan in 1979, the US renew its military support to Pakistan including the sale of nuclear capable F-16. Facing the possibility of losing the conventional superiority over Pakistan, India sought military assistance from the Soviet Union (Vohra, 2013: 250). For example, in 1987, the CIA estimated that the Soviet military assistance and sales had largely surpassed the $ 10 billion limit. This assessment also stated that 65 per cent of the combat aircraft, 40 per cent of the tanks and 70 per cent of the warships in India had Soviet origin (Central Intelligence Agency, 1987: 41-42). Considering such facts, it is no surprise that between 1964 and 1985, India became the largest Soviet trade recipient in the developing world (Lee, 2014: 63).

Additionally the 1979 Soviet invasion, besides renewing the approach between the US and Pakistan, would have another significant impact as it decreased the US-restrictions on the Pakistani nuclear program (Kennedy, 2011: 141). At this time, not only did the Pakistani nuclear efforts begun to concern India but the situation in Kashmir further aggravated and preliminary evidence on the Chinese nuclear assistance to Pakistan emerged, namely on warhead designs (Ramana, 2011). Anticipating the increasingly palpable Pakistani desire for nuclear weapons, the Indian policy-makers begun to gain interest in nuclear weaponry. Several facts corroborate this interest. Firstly, the government decided to initiate an indigenous ballistic missiles program in 1983, named "Integrated Guided Missile Development Program", as an early response to the Pakistani nuclear developments (Kampani, 2014: 88). Secondly, in 1984, during an interview, A. Q. Khan – the mentor of the Pakistani nuclear program – declared Pakistan as a nuclear power. During the same period, an article of the *Washington Post* claimed that Pakistan had already tested explosives of nonnuclear components and could manufacture a bomb in less than a

week. The Indian media immediately picked up on this story and exacerbated it by claiming that Pakistan had already tested a nuclear device. Although the government tried to correct that misperception, all the efforts proved to be unsuccessful. Thirdly, as India carried out a series of large scale military exercises near the Pakistani border, known as "*Brasstacks*", it failed to properly inform the Pakistan's military authorities. As Islamabad saw the Indian military moves near its border, it responded by placing a significant number of its military units on the same area, while Pakistan stakeholders hinted a likely use of nuclear weapons (Izuyama and Ogawa, 2003: 62). Already having the impression that Pakistan had some nuclear capability, the Indian military planners envisioned a preemptive strike against Pakistan, including to its nuclear facilities so to prevent any nuclear retaliation. In the aftermath of this crisis, the domestic pressure begun to pile for India to achieve a nuclear weapons status to counter any Pakistani development in this field (Perkovich, 2001: 279-282).

Although it is hard to pinpoint the precise moment when Prime Minister Gandhi decided to start the development of nuclear weapons, sometime between 1987 and 1989, due to the Pakistani advancements on the nuclear weapons field, a concern also shared by US officials at the time (Weisman, 1987). Concomitantly, New Delhi also accelerated its missile program and in 1989 tested the first Indian manufactured intermediate-range ballistic missile (IRBM) with nuclear weapons capability and based on a civilian space program (Milhollin, 1989). Additional progresses included the ability to reprocess plutonium and the acquisition of sufficient fissile material for 25 nuclear weapons.

At the same time, India's nuclear security assurances started to fade. For example, in 1986 during an Indo-Chinese border clash the Soviet Union failed to support India and with the end of the Soviet intervention in Afghanistan, Moscow approaches Pakistan. Finally, with the fall of the Soviet Union in 1991, New Delhi recognized that it no longer could rely on nuclear powers to counterbalance Pakistani and Chinese nuclear weapons programs (Kennedy, 2011: 141-144). Moreover, although the US ceased to support Pakistan in 1990, five years later the Clinton Administration approved legislation to support military and economically Pakistan, an attempt that had the ultimate purpose – although fruitless – of preventing the additional development of its nuclear weapons.

Additionally, India's renewed nuclear diplomacy efforts failed once more to yield the desired outcomes. As Indian diplomats expected the NPT to cease, after its initial 25 years duration expired, the State-Parties decided to indefinitely extend the duration of the Treaty, thus increasing the pressure for India to accede the NPT. Simultaneously, the international community was also attempting to draft a Treaty to ban nuclear tests – the Complete Test Ban Treaty (CTBT). While India supported the initial negotiations of the first CTBT drafts, it ultimately decided to walk away

from it for two specific reasons. First, it feared the effects of the CTBT on its nuclear program and, secondly, China performed a nuclear test prior to signing this Treaty. This development allowed China to have a better understanding of nuclear weapons, unlike India that just performed one nuclear test (Kimball and Taheran, 2015). Embedded in this diplomatic and regional security context, the Indian domestic support for nuclear weapons increased as the *Bharatiya Janata Party* (BJP) won the 1998 general elections after campaigning for the development of nuclear weapons. Notwithstanding the technical and political conditions that allowed India to initiate the production of a nuclear arsenal, the prompting factor was the 1998 Pakistani test of the nuclear capable *Ghauri* medium-range ballistic missile (MRBM) (Ganguly, 1999: 167-171). Between 11 and 13 May of 1998, India performs *Pokhran-II*, a series of five nuclear weapon explosion tests, including four fission-based weapons and one (attempted) fusion-based weapon, thus announcing to the international community that it was a *de facto* nuclear weapons State. Even though this test came as an expected outcome for some countries, others were not expecting it. For example, the US was caught by surprise as a CIA report written a month before the tests had no mention to the possibility that India might carry a nuclear weapon test (Central Intelligence Agency, 1998).

One year later, India presented the first draft of its Nuclear Doctrine, issued by the National Security Advisory Board, only approved years later. A press release published by Indian Prime Minister's Office clearly summarizes India's nuclear doctrine. First, and foremost, the Indian nuclear posture aims to achieve and maintain a credible minimum deterrent. This sort of posture lies on the premise that the adopted nuclear strategy is based on containment. Operationally, it means that the nuclear forces will be equipped and operate with the purpose of surviving an initial nuclear strike (known as first strike) and be capable of retaliating with nuclear weapons. To reinforce these particular aspects, the second mentioned aspect of India's nuclear posture is the "No First Use" policy. By adopting this particular policy, India reinstates that the use of nuclear weapons is purely defensive and will only be considered if attacked with similar weapons. A third central element states that "nuclear retaliation to a first strike will be massive and designed to inflict unacceptable damage", which leads us to assume that India nuclear retaliation strategy is based on counter-value targeting. Nuclear doctrine outlines that counter-value targeting is aimed at valuable civilian targets, such as cities and civilian population, unlike counterforce targeting that looks for the destruction of military targets. Other elements of the Indian nuclear doctrine include a pledge to not use nuclear weapons against non-nuclear weapons states as well as to maintain its nuclear disarmament and nonproliferation diplomacy commitment. Finally, the nuclear posture designates the entities that control and authorize the use of nuclear weapons, in an attempt to bluntly demonstrate that the nuclear arsenal is under civilian con-

trol (Indian Prime Minister's Office, 2003). A deeper analysis at the Indian nuclear posture also allows us to understand that by adopting a nuclear stance that resembles the one embraced by China, India openly assumes that China is the primary strategic opponent. This is an important point that bears consequences in South Asia trilateral nuclear dynamics, which will be discussed later.

Pakistan

The Pakistani interest in a nuclear program began in the 50's decade and basically with civilian purposes. Taking advantage of the "Atoms for Peace" Program inaugurated by US President Eisenhower, Pakistan created the Pakistan Atomic Energy Commission in 1956 and the Pakistan Institute of Nuclear Science and Technology (PINSTECH) seven years later. Initially, the US supplied Pakistan a nuclear research reactor and, in 1972, the Canadian KANUPP-1 nuclear reactor was finished and Islamabad had its initial nuclear infrastructures.

For several reasons, while holding the position of Foreign Minister, Zulfikar Ali Bhutto developed an interest in acquiring nuclear weapons. First, as China conducted its initial nuclear test, in 1964, the Pakistani political decision-making circles begun to understand that it would be a matter of time before India followed suit. Second, the diplomatic ties between India and Pakistan begun to deteriorate. Ultimately, this *status quo* created the framework from which the Indo-Pakistani Wars of 1965 and 1971 erupted. Third, due to what was perceived by the Pakistanis as an insufficient support by the US during the 1965 clash with India, Islamabad begun to grow increasingly suspicious of the real consistency of its alliance with the US – at the time the main Pakistani military supplier. Furthermore, because the 1965 war clearly showed an Indian conventional superiority *vis-à-vis* Pakistan, Washington's decision to put both countries under a weapons embargo was seen by Islamabad as clearly beneficial to India. Finally, as international nuclear disarmament diplomacy started to gather a growing amount of supporting countries, Pakistan feared that a Treaty banning nuclear weapons would either impede its access to the latter or bring additional isolation for Islamabad. This political anxiety got more exacerbated as India decided to reject the NPT in 1968 (Ahmed, 1999: 180-183).

Addressing these issues is important to understand that the major factors behind the Pakistani decision to develop nuclear weapons predates the 1974 Indian nuclear test. Moreover, as the 1971 Indo-Pakistani confrontations led to an additional defeat of Pakistan and the loss of East Pakistan, the perception that India constituted a strategic threat was reinforced. Consequently, in 1972, President Ali Bhutto held a meeting with Pakistani nuclear scientists in which he requested the development of nuclear weapons. So when New Delhi decided to conduct its "peaceful nuclear explosion" the decision to follow suit had already been taken and solely reinforced the Pakistani goal of achieving a nuclear weapons capability.

In order to access nuclear weapons, Pakistan intended to develop both HEU and plutonium. Because purchasing HEU was not a viable option, the decision was made to start building uranium enrichment facilities and Pakistani authorities entrusted A. Q. Khan with the task. Moreover, not only he succeed in producing HEU for military purposes as he developed a complex and efficient illicit network of nuclear materials trafficking that allowed Pakistan to successfully build nuclear weapons. According to A. Q. Khan itself, Pakistan began to enrich uranium in 1978 and achieved 90% uranium enrichment capability around 1983 (Kerr and Nikitin, 2013: 3-4, 21).

Plutonium, on the other hand, required the development of reprocessing facilities. In 1976, Pakistan signed an agreement with the French *Societe Generale des Techniques Nouvelles* (SGN) for the construction of plutonium reprocessing facilities. Several reasons explain why Pakistan looked for the French nuclear know-how to build a nuclear reactor and a reprocessing facility. First, like Pakistan, at the time France had yet to become a State-Party of the NPT and possessed one of the most advanced civil nuclear technology. Second, Pakistan did not had many options to access to nuclear technology. The US and the United Kingdom were substantial sponsors of the nuclear nonproliferation movement and the Soviet Union was reinforcing its diplomatic ties with India. West Germany was also under US influence so it would not be a viable nuclear technology supplier. Third, there was a belief in Pakistan that France was interested in this deal. Not only did French companies competed with US rivals in the nuclear field but it was assumed that France wanted to expand its influence in third world countries. Finally, Pakistani policy-makers thought that France could withstand US pressure to cease the deal (Dar, 2015: 218). Nonetheless, in 1977, the French authorities unilaterally withdraw from this deal due to pressure exerted by the US. Interestingly enough, in the same year, a military coup led by General Zial-ul-Haq overthrew the then Prime Minister Ali Bhutto. As the Pakistani population began to link the US pressure on the plutonium reprocessing deal and the military coup, the nuclear weapons program started to be seen as a symbol of sovereignty and prestige. Furthermore, with Pakistan's constant progresses in its nuclear program the Carter Administration decided to impose sanctions, which may have accentuated Pakistanis nationalistic view of their nuclear endeavors (Cohen, 2010: 84).

As previously mentioned, the Soviet Union's invasion of Afghanistan in 1979 had a pivotal effect on the Pakistani nuclear program. The nearby presence of Soviet troops turned Pakistan into a strategic ally for the US once more, which in turn allowed a significant progress in the nuclear infrastructure throughout the 80's decade. With the retreat of the Soviet troops from Afghanistan and the end of the Cold War, Pakistan lost its strategic importance to the US thus bringing additional scrutiny to the former's nuclear program. This allowed Washington, for instance, to

pressure Pakistan to limit its enrichment capabilities to 5 per cent. However, this pressure came a bit too late as Pakistan had already understood how useful could nuclear weapons be not only to deter opponents but to serve as a bargaining chip in international diplomacy. For instance, in 1990, as relations between Islamabad and New Delhi deteriorated, Pakistani nuclear threats against India brought the US as a mediator in the conflict.

As a consequence, Pakistan decided to remove the limits on its enrichment capabilities, abandoning its nuclear ambiguity policy while acknowledging its nuclear weapons production capability. The US quickly imposed sanctions once more and in 1991 Prime Minister Sharif restored the previous uranium enrichment limits. Albeit with limitations on developing HEU, the Pakistani nuclear program kept progressing, namely on the production of enriched uranium (although it was still low-enriched uranium), the development of warhead designs, the expansion of uranium enrichment capabilities and the construction of a Chinese-supplied plutonium production reactor (Cirincione *et al*., 2005: 245).

Simultaneously, while understanding the potential that nuclear weapons could have in the diplomatic arena, Pakistan starts to support international nuclear non-proliferation initiatives – namely the NPT or the CTBT – on the premise that any Indian nuclear weapons efforts would cease. Although the Indian nuclear threat was a pivotal factor behind these initiatives, the clear objective behind these actions was the removal of the US sanctions. Nevertheless, with the election of the Hindu-nationalistic *Bharatiya Janata Party* (BJP) in India, the nuclear *status quo* in the region was transformed. For once, during the campaign the BJP advocated the abandonment of India's nuclear ambiguity doctrine over a policy that openly supported "nuclear weaponization" which will be later followed by a rejection of any negotiations over the Kashmir issue. Notwithstanding the nationalist approach of the BJP, the Pakistani military apparatus also did not approve Prime Minister Sharif's attempt to initiate negotiations with India over Kashmir (Ahmed, 1999: 190-193).

In order to match the Indian short and intermediate range missile capabilities, Pakistan decided to test the nuclear capable *Ghauri* medium-range ballistic missile in April of 1998. As previously mentioned, India responded to this missile test with a series of nuclear weapons tests on the following month (Synnott, 1999: 26). Although facing pressure not to respond to the Indian nuclear explosions, the Pakistan did not complied with international requests and carried out five nuclear underground tests two weeks later. Albeit it seems obvious the reasons why Pakistan followed the same nuclear path as India, other motives also played an important role in Islamabad's decision. For instance, Pakistan would not accept a non-nuclear status when India had just openly admitted its nuclear weapons capability. It was not just a matter of balance of power in the region but also a matter of international prestige.

Currently, Pakistan does not have a publicly declared nuclear doctrine but it is possible to identify four of its major aspects. First, although Pakistan clearly states that its nuclear arsenal aims to deter all forms of external aggression, its primary deterrence target is India. Second, the Pakistani nuclear doctrine is based on a minimum credible deterrence. Although it sounds very similar to India's nuclear posture of credible minimum deterrence, the difference is more than semantical. Contrary to an Indian posture based on a minimalist nuclear arsenal, Pakistan's policy relies on credibility in order to assure its opponents that it can cause unacceptable damage.
Third, contrary to China and India, Pakistan does not have a "No First-Use" nuclear policy. The reason lies on the premise that the Pakistani nuclear arsenal does not have the sole purpose of balancing the Indian nuclear capabilities but also to deter any hypothetical Indian conventional incursions inside the Pakistani territory. Notwithstanding the absence of a formal declaration stating how Pakistan may contemplate the initial use of nuclear weapons, revelations from Pakistan's General Kidwai have highlighted some circumstances in which such may be considered, including: (1) if India attacks Pakistan and occupies a significant portion of its territory; (2) if an Indian attack destroys a significant part of Pakistani ground and air forces; (3) if India strangles the Pakistani economy, namely through naval blockages or by altering the course of the Indu river and; (4) If India politically destabilizes or provokes a "large scale internal subversion" in Pakistan. Although the last two circumstances are not seen as likely to trigger nuclear weapons use, the same cannot be said about the first two. Nonetheless, Pakistan has pledged not to use nuclear weapons against non-nuclear weapons States unless they are a part of a coalition with a nuclear weapons country.
Fourth, the strategic requirements of Pakistan's nuclear posture are dynamic as they are highly dependent on the threat perception emanating from India. Consequently, any modernization or upgrade efforts made by India – either in terms of its conventional or nuclear arsenal – will resonate on the quantitative and qualitative parameters of the Pakistani nuclear arsenal. This is one of the reasons why Pakistan is highly ambiguous on its (unwritten) nuclear doctrine. It creates uncertainty and avoids supplying India with any course of action below the nuclear threshold (Fitzpatrick, 2013: 27-32; Krepon, 2012: 7-11). Next we will explain how these three nuclear doctrines and postures interact with each other.

Trilateral Nuclear Dynamic in South Asia

Understanding how the nuclear dynamics works in the South Asia requires a deeper look on how the nuclear arsenals have developed over the past years and how do they impact the other countries involved in this regional dynamic.
Starting with the Chinese nuclear arsenal. This country has been basing its nuclear modernization efforts into two specific areas. First, the current modernization pro-

cess aims to be gradual with the aspiration to replace the old missiles based on 60's and 70's technology. Second, strategic imperatives created the need to have more credible and mobile missile capabilities upgraded with missile defense countermeasures in order to ensure a second strike capability (Fravel and Medeiros, 2010: 81-82).

To achieve these two major goals, China decided to take a number of steps. On its ground missile forces, efforts have been directed to substitute liquid fuel vectors for solid-fuel ones while increasing the mobility of the latter. Additionally, China has been pursuing substantial investments on building a credible naval second strike capability including a new Type 094 nuclear-powered ballistic missile submarine (SSBN) and is already planning for the next generation of SSBN, the Type 096. To better enhance the naval branch of the Chinese nuclear triad, Beijing is also developing new submarine-launched ballistic missiles (SLBM), which according to estimates made by the US could reach as much as 7400 kilometers and have MIRV capabilities. By 2020, the Chinese military apparatus expects to develop a new SLBM, the JL-3, with 11 thousand kilometers range and with MIRV capability as well. In terms of its Air Force, China is upgrading its nuclear bombers and producing its first nuclear long-range cruise missiles, the CJ-10k (Galamas, 2015: 31-33).

But why is China investing so much in the upgrade of its nuclear platforms? As previously mentioned, one of the major factors behind Chinese development of nuclear weapons was the fear of an US nuclear attack. Nowadays, albeit the Chinese need to replace some of its nuclear vectors, the strategic competition in Asia still mandates that China can be able to uphold an effective deterrence capability *vis-à-vis* the US. To keep such capability, China has been reacting to two specific technological platforms that the US is slowly implementing in its military doctrine and could impact China's assured second strike capability, which its nuclear doctrine is based upon.

The first is the placement of antimissile intercepting systems in Northeast Asia. Due to the fear of a North Korean ballistic missiles launch, the US placed in Japan seven destroyers equipped with the Aegis antimissile systems in order to support Tokyo's four layered missile defense structure. Over the last months, there was negotiations between the US and the South Korean government over the placement of a THAAD antimissile system. Notwithstanding that these systems are supposed to intercept any missile launches from North Korea, they could also undermine China's nuclear deterrence capabilities. To properly deal with this threat to its second strike capability, the People's Liberation Army (PLA) has been modifying some of its nuclear missiles. For instance, some missiles, like the DF-41 ICBM (which is still under development), are planned to have MIRV and MaRV warheads incorporated as well as other missile defense countermeasures. Beijing is also trying to develop an antimissile intercepting system. In 2014, according to government sources, it con-

ducted its third antimissile test without providing further details, after previous tests in 2010 and 2013. However, China is also conducting anti-satellite weapons tests which rely on the same "hit-to-kill" principle that the antimissile interceptors do so it is currently unclear what the final purpose of this technology is (Keck, 2014).

The other US development that could have an impact in China's strategic arsenal is the adoption of the *Prompt Global Strike* (PGS) system. When operational, the PGS will allow the US military to strike any target, in less than one hour, with high precision, resorting to hypersonic platforms. Faced with the risk of having its nuclear delivery platforms destroyed in a preemptive nuclear strike, China has been upgrading its nuclear arsenal. As already mentioned, the Chinese nuclear ground forces have been modified in order to have enhanced mobility and therefore more difficult to target (Galamas, 2015: 35-39).

Albeit the US is the main driving force behind the Chinese nuclear modernization, the nuclear progresses verified in India have an impact on the latter process as well. Point in fact, in 2015, the Pentagon mentioned in one of its report about China's military capabilities that India's nuclear endeavors were an additional driver for the Chinese nuclear modernization (Office of the Secretary of Defense, 2015: 31-32). Since India carried out its first "peaceful nuclear" explosion that China has been following closely New Delhi nuclear efforts. After the Indian 1974 nuclear test, the Chinese authorities responded with a thermonuclear test and throughout this decade expanded its ballistic missiles reach in order to cover Indian cities. However, China has avoided a direct competition with the Indian nuclear program and instead decided to support Pakistani nuclear capabilities opening another nuclear front forcing India to divert military capabilities away from China (Pardesi, 2015: 341).

This Chinese-Pakistani nuclear cooperation probably began in 1976, although it took more than a decade for both countries to sign a formal treaty on this topic, and it has allowed Islamabad to achieve significant nuclear progresses. According to published reports, in 1982 China supplied 50 kilograms of HEU to Pakistan to build two nuclear bombs and a year later a design for a 25Kt nuclear weapon was also given to the Pakistani military. But the nuclear assistance was not solely related to weapons as the cooperation included technical support in fissile material production. In 1985, Chinese technicians supported Pakistan's Kahuta facility in the production of weapons-enriched uranium and, seven years later, China announced the construction of a nuclear power plant in Pakistan. After the Pakistani 1998 nuclear tests, the joint nuclear efforts picked up pace and China agreed to support the construction of four nuclear reactors in Pakistan. More recently, the Chinese authorities announced further support for the construction of 5 additional nuclear reactors (Parameswaran, 2015). Moreover, additional Chinese assistance to the Pakistani

ballistic missile program has been also granted over the years. In 1988, Pakistan had access to Chinese M-11 nuclear capable short-range ballistic missiles and other accounts mention China's (as well as North Korea's) pivotal role in the *Hatf-1*, *Hatf-2* and *Shaheen* missile programs (Paul, 2003: 4-5).

All these efforts struck a nerve on India's strategic elite as New Delhi has yet to achieve an assured second strike capability against China. In order to achieve it, India has been upgrading its missiles (especially their range), developing a maritime nuclear deterrence and antimissile systems. For example, due to the limited range of the Indian nuclear bombers as the country lacks air-refueling capabilities – besides being unable to surpass the Chinese air defenses – a decision was made to start a missile program in 1983 (Kumar and Vannoni, 2004: 20). With the specific purpose of deterring China, ballistic missiles such as the *Agni-III* (3500 kilometers) and *Agni-V* (5000 kilometers) were developed (Chansoria, 2011: 2). Still, India wishes to add new nuclear delivery platforms as the currently and under development *Agni-VI* ICBM with 10 thousand kilometers range clearly demonstrates (Panda, 2015a). For India, the most important strategic nuclear objective is to have an assured second strike capability and, more importantly, capable of reaching the majority of Chinese cities.

Other missile upgrades include development of mobile canister-launchers to allow quicker missile launches as well as the addition of MIRV warheads to the Indian ballistic missiles in order to tackle the Chinese missile defense upgrades (Kristensen, 2013). Furthermore, factors as international prestige and great power aspirations are also important aspects to be considered when debating the development of long range missiles in India. A point worth mentioning is that India does not seek a quantitative parity towards the Chinese nuclear arsenal but aims to adapt its arsenal to the current security context and to the technological upgrades made by regional opponents in order to maintain its nuclear credibility.

If we consider nuclear tests, for instance, China has carried out around 45 tests with several types of nuclear devices while India has only performed six. Similar differences are also present in other aspects of the Indian atomic arsenal. Indian strategic community believes that an assured nuclear retaliation capability will only be achieved once India fully develops maritime nuclear delivery platforms (Pardesi, 2015: 343-344). Efforts in this direction have been made. India has already built a SSBN – the INS *Arihant* – which is currently undergoing sea trials while another three additional SSBN are planned for construction until 2020 (Saksena, 2015). The problem currently lies on the submarine-launched ballistic missile (SLBM) for these SSBN. India's only successfully tested SLBM, the K-15, has a 700 kilometers range which is insufficient to reach the major Chinese strategic assets. Another SLBM has been under development by India, the K-4, but its range (between 1500 and 3000 kilometers) is still insufficient to uphold a maritime nuclear deterrence capability

vis-à-vis China. Analysts consider that without a SLBM with 5000 kilometers range it is highly doubtful that India can target the majority of the cities in China without exposing their SSBN to the superior Chinese naval capabilities (Pardesi, 2015: 345). Other problems arise from command and control issues that the SSBN bring may also prove to be a significant hurdle for New Delhi.

Finally, India is developing an antimissile intercepting system. The idea for an Indian domestically-built missile defense system appeared in the 1990's after Pakistan acquired the Chinese supplied M-9 and M-11 missiles (Sharma, 2009: 1-5). Currently, the Indian Defence Research and Development Organisation (DRDO) is trying to develop a two-layered antimissile system (comprising the *Prithvi* Air Defence system and the Advanced Air Defence system) in order to intercept missiles (Narang, 2013: 146). Still years away from achieving operational status, the last tests have proved to be unsuccessful but carry a strong strategic impact to the region.

As India is seeking MIRV warheads to counter the possibility of a Chinese antimissile system, a similar impact could be witnessed in Pakistan. The lack of confidence in its nuclear delivery means may lead Pakistan into a quantitative and qualitative missile arms race to develop countermeasures for this particular Indian system. Another probable consequence could be a stronger Pakistan-China cooperation on nuclear and missile related topics.

Even though India has nuclear forces more than capable of deterring Pakistan, New Delhi has adapted some of its arsenal to the nuclear challenges brought by its western-neighboring country. Tactical ballistic missiles, such as the nuclear capable *Prahaar*, were developed to complement the Indian "Cold Start" limited war doctrine and to strike counterforce targets. It was likely a response to the Pakistan's development of the nuclear capable SRBM *Nasr* (O'Donnel, 2013).

Another important factor in the region's nuclear calculus is the 2008 US-India civilian nuclear cooperation deal, known as the 123 Agreement. Under this agreement, India would separate its civilian and military nuclear facilities, place the former under IAEA safeguards and receive US civilian nuclear technology. The US also campaigned for the Nuclear Suppliers Group (NSG) approval of this deal and helped India to gain a "waiver" exempting it from fulfilling all of the NSG rules to access the civilian nuclear trade (Squassoni, 2010). Most importantly, these arrangements allow New Delhi to access uranium for its nuclear reactors and thus diverting its own uranium for military purposes. Some reports claim that the deal might put 8 Indian nuclear reactors, with a combined capability to produce enough fissile material for 280 nuclear weapons, outside of the AIEA's safeguards scope (Kerr and Nikitin, 2013: 7).

As a consequence, Pakistan has been improving its capabilities to increase the production of HEU and plutonium stock and, consequently, its nuclear arsenal (Squas-

soni, 2010). As China was also not pleased with this deal as well, it decided to support the Pakistani nuclear fuel endeavors and the construction of more nuclear reactors, such as Chasma-3 and Chasma-4 (Pant, 2012: 91-92). Notwithstanding the strategic importance of the US-India civilian nuclear deal, it is important to bear in mind that the latter does not constitute an alliance as India wishes to keep its strategic autonomy. On the other hand, it is highly doubtful that India will achieve an assured second strike capability in the short-term against China as its investments on its nuclear arsenal – like the new and mobile delivery means, MIRV warheads or missile defense systems – are likely to keep the nuclear military gap between New Delhi and Beijing. Still, the nuclear dynamic concerning these two countries is likely to remain stable over the short term as China clearly has a reliable second strike capability vis-à-vis India while the latter has an *existential deterrence* capability vis-à-vis China. This particular type of deterrence implies that although the Indian second strike capability is uncertain, the mere presence of nuclear weapons and delivery platforms generate sufficient risk of nuclear escalation thus creating a *de facto* nuclear deterrence between both countries (Narang, 2014: 6). Regarding Pakistan, India not only has a nuclear arsenal capable of deterring the former country but its conventional military apparatus is more than capable of handling any Pakistani conventional threat.

Concerning Indian conventional superiority, Pakistan's nuclear progresses present a specific challenge to the region. They do not solely represent a reaction against Indian nuclear developments but also to New Delhi's conventional military superiority. The justification for this posture lies on Pakistan's inferior military capabilities and the country's lack of strategic depth. It is also necessary to take into account the perception that exists in some Indian policy-makers that the country could survive a nuclear clash with Pakistan. The growth of the Pakistani nuclear arsenal also represents the necessity to have the ability to provoke unacceptable damage on India, in case a nuclear confrontation arises. Such "victory denial" strategy aims to prevent India from exploring any loophole in the Pakistani nuclear deterrence posture (Krepon, 2012: 22-23). Finally, and contrary to other nuclear weapons countries, Pakistan has no desire to international prestige or great power status (Izuyama and Ogawa, 2003: 66).

As India shifted its focus towards establishing a maritime nuclear deterrence capability and developing antimissile systems, Pakistan reacted accordingly. It began to develop cruise missiles in an attempt to surpass any India antimissile system. Besides, as India dedicates substantial investments to develop a SSBN with SLBM capability, Pakistan tries to overcome the absence of its own SLBM by developing cruise missiles for naval platforms, namely for its submarine fleet. Some analysts claim that the *Babur* cruise missile is being modified to be deployed by Pakistani submarines. Once more, China will support Pakistan in this endeavor as, in Octo-

ber of 2015, both countries signed a deal to build eight submarines (Ansari, 2015). All of these ballistic missile improvements are envisioned to reinforce Pakistan's second strike capability.

Another reason behind the progresses made on the Pakistani SRBM is the Indian "Cold Start" Doctrine. This limited war doctrine was developed in 2004 by the Indian Army in order to properly respond to Pakistan's proxy war in Kashmir. It consists on the offensive use of India's conventional superiority to occupy small portions of the Pakistani territory (between 50 to 80 kilometers) in order to gain concessions from Islamabad (Ladwig III, 2008: 163-165). Basically, India wanted to devise a doctrine that would permit a retaliation against Pakistani support of violent non-state groups without crossing the nuclear threshold (Kanwal, 2010). As a response, Pakistan lowered the nuclear threshold and included tactical nuclear weapons as a response to the "Cold Start" Doctrine. For the first time, in October of 2015, Pakistan – through its Foreign Secretary Aizaz Chaudhary – admitted the country's intention of using tactical and theater level nuclear weapons against India (Panda, 2015b). For this particular purpose, Pakistan has been testing SRBM like the *Nasr* and *Abdali* as a clear demonstration of its intention to employ tactical nuclear weapons if necessary (Dalton and Tandler, 2012: 17). As we look into the "action-reaction" cycle that characterizes this particular nuclear dynamic, it becomes clear that some of the reactions above described may jeopardize the regional nuclear stability.

Stability Risks in the Trilateral Nuclear Dynamic

When looking at the progresses made or planned by these three nuclear weapons countries, it is possible to identify some issues that may be able to have some destabilizing effects in the region. For example, the installation of MIRV warheads in nuclear delivery systems can yield a number of consequences. First, missiles with MIRV warheads significantly increase the first strike capability and, second, by creating a security dilemma in the opponent country, these vectors become a desirable target therefore inviting an opponent to strike first. If China or India pursue their intentions of installing MIRV warheads in their ballistic missiles, it is likely that the countries in the region may react accordingly.

The regional proliferation of cruise missiles and sea-based nuclear platforms may also be another element of instability. Not only are cruise missiles difficult to detect but they also are "dual-capable" which means that they can carry conventional warheads as well nuclear ones. This particular aspect is likely to create additional uncertainty in the opponent because it may misinterpret a conventional missile launch for a nuclear one (Krepon, 2012: 29).

Furthermore, bringing naval platforms into the regional nuclear deterrence formula could also provoke similar results for different reasons. India is building its

first SSBN and is trying to produce a SLBM with sufficient range to establish a more effective nuclear deterrence towards China. Pakistan, to counter these breakthroughs, is planning to adapt nuclear cruise missiles for submarines. Both of each platforms require highly sophisticated and survivable communications systems so these can withstand an initial nuclear strike and be able to receive or cancel a retaliation order. The lack of these systems may lead to unauthorized or accidental use of nuclear weapons. Other identified issue is the changes in the nuclear force posture that these platforms provoke. For an adequate sea nuclear deterrence posture, the warhead and the delivery vector must be assembled instead of being separated as they usually are while on ground platforms. Such posture increases the level of readiness and requires that both navies do the utmost to prevent unintended use of nuclear weapons (Thomas-Noone and Medcalf, 2015: 10).

Another problem lies in the "action-reaction" cycle behind this trilateral nuclear dynamic. If we look into the particular case of China, as it aims to consolidate a great power status it is modernizing the nuclear arsenal to deter the US, which is likely to influence India to improve its own nuclear weapons which will then fuel a regional arms race with Pakistan (Hagerty, 2014: 309).

The nuclear posture of India itself also presents some destabilizing elements. As already explained, the official doctrine is based on a credible minimum deterrence in order to dissuade two opponents with different nuclear forces. Because China is India's main nuclear opponent, it attempts to balance its nuclear arsenal mainly with Beijing instead of Islamabad. The instability rises as India's endeavors to maintain a credible minimum deterrence with China will logically unbalance its nuclear dynamic with Pakistan. Another element of this doctrine that requires further analysis is the "No-First Use" policy. When looking at the Indian Prime Minister's Office press release describing the nuclear doctrine it is possible to read "however, in the event of a major attack against India, or Indian forces anywhere, by biological or chemical weapons, India will retain the option of retaliating with nuclear weapons" (Indian Prime Minister's Office, 2003).

By admitting the use of nuclear weapons against biological or chemical attacks, India is falling into a "Commitment Trap".[3] Such decision can bring additional

3 The "Commitment Trap" is a terminology used by nuclear theorist Scott Sagan in his article "The Commitment Trap: Why the United States Should Not Use Nuclear Threats to Deter Biological and Chemical Weapons Attacks" in which he addresses the unnecessary risks present when States threaten the use of nuclear weapons against chemical or biological weapons attacks. More specifically the author claims that "… the current nuclear doctrine creates a 'commitment trap': threats to use nuclear weapons in response to a chemical or biological attack are credible, because if CW or BW are used despite such threats, the U.S. president would feel compelled to retaliate with nuclear weapons to maintain his or her international and domestic reputation for honoring commitments". See Sagan (2000: 85-115).

misperceptions risks that could ultimately lead to an unjustified use of nuclear weapons, thus steering away from what truly constitutes a "No-First Use" policy. Finally, India must be aware that the improvements made in its nuclear arsenal will not only fuel the described nuclear "action-reaction" cycle but lead to a reinforced nuclear cooperation between Pakistan and China as well.

Regarding Pakistan, its nuclear strategy and attempt to have "full-spectrum" deterrence also generate additional risks for the regional nuclear stability (*e.g.* the inherent problems linked to the presence of submarine-based cruise missiles). Accordingly, tactical nuclear weapons can present Pakistan with similar situations linked to the required pre-delegation of launch authorization given to tactical/operational commanders or the pre-mating of warheads in the delivery systems that can undermine some of the safeguards against unauthorized/accidental use of nuclear weapons. As the assembled weapons make their way to the battlefield, one should also assume the possibility that they might be stolen by non-state groups. Finally, the geographical proximity and the lack of real-time surveillance create a challenge for deterrence stability especially when it includes the use of tactical nuclear weapons possibility (Fitzpatrick, 2013: 51).

Conclusion

Analyzing the nuclear issues that hang over South Asia is not an easy task as it goes well beyond the bilateral conundrum that embeds the India-Pakistan diplomatic relationship. To properly interpret the facts that surround South Asian nuclear weapons issues requires that we do not overlook the dynamic that exists between India and China. Changing the analysis framework from a bilateral perspective to a trilateral one enables us to adequately understand the nuclear dynamics in this region and its impacts.

Considering this particular aspect, addressing the tensions between India and Pakistan – as advocated in some published analysis – will only solve some of the causes behind the nuclear tensions in South Asia. The strategic dynamic between China and India – including its nuclear dimension – has been an overlooked topic in most of the nuclear weapons literature focusing on Asia. Still, and albeit overlooked, in order to further stabilize this trilateral nuclear dynamic, it is pivotal to understand how these nuclear arsenals influence each other to further mitigate their mutual impact.

Another important issue surrounding this trilateral strategic dynamic is linked to the US nuclear arsenal and its impact on the Chinese nuclear weapons arsenal. Trying to address the strategic problems regarding nuclear weapons in South Asia will also need to take into consideration this latter aspect. As the dimensions of the Chinese and Indian nuclear arsenals are difficult to compare in terms of quantity and quality, it would make more sense to have China negotiating with the US and

Russia on nuclear weapons limitations.[4] Even if with a very specific scope, such agreement could serve as an incentive and a confidence building measure for India to engage in a similar initiative with Pakistan.

Finally, in order to tackle the problematic diplomatic relationship between Pakistan and India, policy-makers must understand that nuclear weapons are not the cause but one of the symptoms of the latent instability between both countries. Accordingly, basing any bilateral negotiations on the core issues behind the Pakistan-India animosity, instead of focusing solely on the nuclear weapons, could have a positive spillover effect and possibly allow for a decrease of the nuclear threat in South Asia.

Finally, the stabilization of the trilateral nuclear dynamics in South Asia requires not only the involvement of China, India and Pakistan but also of other countries that, albeit not directly involved, still directly exert a strong influence in this dynamic, namely the US. Failing to do so will only perpetuate the South Asian nuclear "action-reaction" cycle and exacerbate the threats that undermine the fragile regional stability.

References

Ahmed, Samina (1999). "Pakistan's Nuclear Weapons Programs". *International Security* nº 4, pp. 178-204.

Ansari, Usman (2015). "Pakistan, China Finalize 8-Sub Construction Plan". *Defense News*. 11 October. Available at http://www.defensenews.com/story/defense/naval/submarines/2015/10/11/pakistan-china-finalize-8-sub-construction-plan/73634218/.

Burr, William and Jeffrey T. Richelson (2000). "Whether to "Strangle the Baby in the Cradle": The United States and the Chinese Nuclear Program, 1960–64". *International Security* nº 3, pp. 54-99.

Chansoria, Monika (2011). "India's Missile Programme: Building Blocks for Effective Deterrence". *Issue Brief* nº 26. New Delhi: Center for Land Warfare Studies. Available at http://www.claws.in/images/publication_pdf/1316063650IB%2026.pdf.

Cirincione, Joseph; Jon B. Wolfsthal and Miriam Rajkumar (2005). *Deadly Arsenals: Nuclear, Biological, and Chemical Threats*. Washington: Carnegie Endowment for International Peace.

Cohen, Stephen P. (2010). "Pakistan and the Cold War" in Chandra Chari (ed.), *Superpower Rivalry and Conflict: The Long Shadow of the Cold War on the Twenty-first Century*. London: Routledge.

4 For further details see Federation of American Scientists reports on the Chinese Nuclear Forces at http://bos.sagepub.com/content/71/4/77.full.pdf and on the Indian Nuclear Forces at http://bos.sagepub.com/content/71/5/77.full.pdf.

Dalton, Toby and Jaclyn Tandler (2012). *Understanding the Arms "Race" in South Asia*. Carnegie Paper, September. Washington: Carnegie Endowment for International Peace.

Dar, Humaira (2015). "Franco-Pakistan Nuclear Deal (1976): An Analytical Study". *Journal of Pakistan Vision* nº1, pp. 215-257. Available at http://pu.edu.pk/images/journal/studies/PDF-FILES/Artical-11_v16_1.pdf.

Fravel, M. Taylor and Evan S. Medeiros (2010). "China's Search for Assured Retaliation: the Evolution of Chinese Nuclear Strategy and Force Structure". *International Security* nº 2, pp. 48-87. Available at http://www.mitpressjournals.org/doi/pdfplus/10.1162/ISEC_a_00016.

Fitzpatrick, Mark (2013). *Overcoming Pakistan's Nuclear Dangers*. Adelphi Papers nº 443. London: International Institute for Strategic Studies.

Galamas, Francisco (2015). "The Motivations behind the Nuclear Modernization Programs of the P5". *Nação e Defesa* nº 140, pp. 25-46.

Ganguly, Sumit (1999). "India's Pathway to Pokhran II: the Prospects and Sources of New Delhi's Nuclear Weapons Program". *International Security* nº4, pp. 148-177.

Ghose, Arundhati (1997). "Negotiating the CTBT: India's Security Concerns and Nuclear Disarmament". *Journal of International Affairs* nº 1, pp. 239-261.

Hagerty, Devin T. (2014). "India's Evolving Nuclear Posture". *The Nonproliferation Review* nº 3-4, pp. 295-315.

Izuyama, Marie and Shinichi Ogawa (2003). "The Nuclear Policy of India and Pakistan". *NIDS Security Reports* nº 4. Tokyo: National Institute for Defense Studies, pp. 58-89. Available at http://www.nids.go.jp/english/publication/kiyo/pdf/bulletin_e2002_3.pdf.

Kampani, Gaurav (2014). "New Delhi's Long Nuclear Journey: How Secrecy and Institutional Roadblocks Delayed India's Weaponization". *International Security* nº 4, pp. 79-114.

Kanwal, Gurmeet (2010). "India's Cold Start Doctrine and Strategic Stability". *IDSA Comment*. 1 June. Available at http://www.idsa.in/idsacomments/IndiasColdStartDoctrineandStrategicStability_gkanwal_010610.

Keck, Zachary (2014). "China Conducts Third Anti-Missile Test". *The Diplomat*. 24 July. Available at http://thediplomat.com/2014/07/china-conducts-third-anti-missile-test/.

Kennedy, Andrew B. (2011). "India's Nuclear Odyssey: Implicit Umbrellas, Diplomatic Disappointments, and the Bomb". *International Security* nº2, pp. 120–153.

Kerr, Paul K. and Mary Beth Nikitin (2013). "Pakistan's Nuclear Weapons: Proliferation and Security Issues". *Congressional Research Service*. 13 February. Available at http://fpc.state.gov/documents/organization/205211.pdf.

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

Kimball, Daryl G. and Shervin Taheran (2015). "Nuclear Testing and Comprehensive Test Ban Treaty (CTBT) Timeline". *Fact Sheets and Briefs*. Arms Control Association. 22 September.

Available at http://www.armscontrol.org/factsheets/Nuclear-Testing-and-Comprehensive-Test-Ban-Treaty-CTBT-Timeline.

Krepon, Michael (2012). "Pakistan's Nuclear Strategy and Deterrence Stability". Stimson Center. 10 December. Available at http://www.stimson.org/images/uploads/research-pdfs/Krepon_-_Pakistan_Nuclear_Strategy_and_Deterrence_Stability.pdf.

Kristensen, Hans M. (2013). "India's Missile Modernization beyond Minimum Deterrence". *Federation of American Scientists*. 4 October. Available at https://fas.org/blogs/security/2013/10/indianmirv/.

Kumar, Arvind and Michael Vannoni (2004). *Ballistic Missile Proliferation in Southern Asia: Options for Stabilization*. Cooperative Monitoring Center Occasional Paper nº 34. Sandia National Laboratories. February. Available at http://www.sandia.gov/cooperative-monitoring-center/_assets/documents/sand2004-0317.pdf.

Latif, Amir (2014). "A Comparative Study of Nuclear Doctrines of India and Pakistan". *Journal of Global Peace and Conflict* nº 1, pp. 129-146. Available at http://jgpcnet.com/journals/jgpc/Vol_2_No_1_June_2014/7.pdf.

Ladwig III, Walter C. (2008). "A Cold Start for Hot Wars? The Indian Army's New Limited War Doctrine". *International Security* nº 3, pp. 158-190.

Lee, Lavina (2014). "Russia's Engagement in India" *in* Ian Hall (ed.), *The Engagement of India: Strategies and Responses*. Washington: Georgetown University Press, pp. 61-88.

Lewis, John Wilson and Hua Di (1992). "China's Ballistic Missile Programs: Technologies, Strategies and Goals". *International Security* nº 2, pp. 5-40. Available at http://iis-db.stanford.edu/pubs/20613/china's_ballistic_missile_programs.pdf.

Manning, Robert A.; Ronald Montaperto and Brad Cochairs (2000). *China, Nuclear Weapons, and Arms Control: a Preliminary Assessment*. Washington: Council on Foreign Relations, National Defense University, and the Institute for Defense Analyses. Available at http://www.taiwandocuments.org/cfr01.PDF.

Milhollin, Gary (1989). "India's Missiles – With a Little Help from Our Friends". *Bulletin of the Atomic Scientists*. November. pp. 31-35 Available at http://www.wisconsinproject.org/pubs/articles/1989/indiasmissiles-dodging.htm.

Mohan, C. Raja (1998). "India and Nuclear Weapons". *Internationale Politik und Gesellschaft* nº 4, pp. 377-383. Available at http://library.fes.de/pdf-files/ipg/ipg-1998-4/artmohan.pdf.

Narang, Vipin (2013). "Five Myths about India's Nuclear Posture". *The Washington Quarterly* nº 3, pp. 143-157. Available at http://csis.org/files/publication/TWQ_13Summer_Narang.pdf.

Narang, Vipin (2014). *Nuclear Strategy in the Modern Era: Regional Powers and International Conflict*. Princeton: Princeton University Press.

No Author (1969). "The USSR and China". *National Intelligence Estimate* nº 11/13-69. 12 August. Available at http://www.foia.cia.gov/sites/default/files/document_conversions/89801/DOC_0000261304.pdf.

No Author (1987). "Soviet Foreign Military Assistance". *Central Intelligence Agency*. Interagency Intelligence Memorandum. May. Available at http://www.foia.cia.gov/sites/default/files/document_conversions/89801/DOC_0000802746.pdf.

No Author (1998). "India: Problems and Prospects for the BJP Government". *Central Intelligence Agency*. Intelligence Report. 13 April. Available at http://nsarchive.gwu.edu/NSAEBB/NSAEBB187/IN36.pdf.

No Author (2003). "Apsara Research Reactor". *Nuclear Threat Initiative*. 1 September. Available at http://www.nti.org/facilities/818/.

No Author (2003). "Canadian-Indian Reactor, U.S.". *Nuclear Threat Initiative*. 1 September. Available at http://www.nti.org/facilities/832/.

No Author (2003). "Cabinet Committee on Security Reviews Progress in Operationalizing India's Nuclear Doctrine". Indian Prime Minister's Office. 4 January. Available at http://pib.nic.in/archieve/lreleng/lyr2003/rjan2003/04012003/r040120033.html.

No Author (2015). *Annual Report to Congress: Military and Security Developments Involving the People's Republic of China 2015*. Office of the Secretary of Defense. 7 April. Available at http://www.defense.gov/Portals/1/Documents/pubs/2015_China_Military_Power_Report.pdf.

No Author (1969). "Memorandum of Conversation". *US State Department*. 18 August. Available at http://nsarchive.gwu.edu/NSAEBB/NSAEBB49/sino.sov.10.pdf.

O'Donnel, Frank (2013). "Managing India's Missile Aspirations". *IDSA Comment*. 10 February. Available at http://www.idsa.in/idsacomments/ManagingIndiasMissileAspirations_fodonnell_100213.

Panda, Ankit (2015a). "India Is Capable of Developing a 10,000-Kilometer Range ICBM". *The Diplomat*. 6 April. Available at http://thediplomat.com/2015/04/india-is-developing-a-10000-kilometer-range-icbm/.

Panda, Ankit (2015b). "Pakistan Clarifies Conditions for Tactical Nuclear Weapon Use Against India". *The Diplomat*. 20 October. Available at http://thediplomat.com/2015/10/pakistan-clarifies-conditions-for-tactical-nuclear-weapon-use-against-india/.

Pant, Harsh V. (2012). "The Pakistan Thorn in China—India—U.S. Relations". *The Washington Quarterly* nº 1, pp. 83-95. Available at http://csis.org/files/publication/twq12winter-pant.pdf.

Pardesi, Manjeet S. (2014). "China's Nuclear Forces and Their Significance to India". *The Nonproliferation Review* nº 3-4, pp. 337-354.

Parameswaran, Prashanth (2015). "China Confirms Pakistan Nuclear Projects". *The Diplomat*. 10 February. Available at http://thediplomat.com/2015/02/china-confirms-pakistan-nuclear-projects/.

Paul, T.V. (2003). "Chinese-Pakistani Nuclear/Missile Ties and the Balance of Power". *The Nonproliferation Review* nº 2, pp. 1-9.

Perkovich, George (2001). *India's Nuclear Bomb: The Impact on Global Proliferation*. Berkeley: University of California Press

Pillalamarri, Akhilesh (2015). "Pakistan's Nuclear Weapons Program: 5 Things You Need to Know". *The National Interest*. 21 April. Available at http://nationalinterest.org/feature/pakistans-nuclear-weapons-program-5-things-you-need-know-12687.

Ramana, Siddharth (2011). *China-Pakistan Nuclear Alliance: an Analysis*. IPCS Special Report nº 109. Available at http://www.ipcs.org/pdf_file/issue/SR109.pdf.

Sagan, Scott (1996). "Why Do States Build Nuclear Weapons? Three Models in Search of a Bomb". *International Security* nº 3, pp. 54-86.

Sagan, Scott (2000). "The Commitment Trap: Why the United States Should Not Use Nuclear Threats to Deter Biological and Chemical Weapons Attacks". *International Security* nº 4, pp. 85-115.

Saksena, Amit R. (2015). "Can India Accommodate the INS Arihant?". *The Diplomat*. 26 January. Available at http://thediplomat.com/2015/01/can-india-accommodate-the-ins-arihant/.

Sharma, Ashok (2009). *India's Missile Defence Programme: Threat Perceptions and Technological Evolution*. Manekshaw Paper nº 15. New Delhi: Centre for Land Warfare Studies. Available at http://www.claws.in/images/publication_pdf/1262760881MP_15___111209.pdf.

Snow, Edgar (1965). "South of the Mountains to North of the Seas: Excerpts from American Journalist Edgar Snow's Interview with Mao Tse-Tung" in *Selected Works of Mao Zedong* (Vol. IX). Available at https://www.marxists.org/reference/archive/mao/selected-works/volume-9/appendix.htm.

Squassoni, Sharon (2010). "The U.S.-Indian Deal and Its Impact". *Arms Control Today*. 2 July. Available at https://www.armscontrol.org/act/2010_07-08/squassoni.

Synnott, Hilary (1999). "Why test in 1998?". *The Adelphi Papers* nº 332, pp. 11-26.

Thomas-Noone, Brendan and Rory Medcalf (2015). *Nuclear-armed Submarines in Indo-Pacific Asia: Stabiliser or Menace?*. Lowy Institute for International Policy. Available at http://www.lowyinstitute.org/files/nuclear-armed-submarines-in-indo-pacific-asia-stabiliser-or-menace_0.pdf.

Udgaonkar, B. M. (1999). "India's Nuclear Capability, her Security Concerns and the Recent Tests". *Current Science* nº 2, 25 January. Available at http://www.currentscience.ac.in/Downloads/article_id_076_02_0154_0166_0.pdf.

Vohra, Ranbir (2013). *The Making of India: A Political History*. London: Routledge.

Weisman, Steven (1987). "Pakistan's Nuclear Aims Worrying U.S.". *The New York Times*. 20 February. Available at http://www.nytimes.com/1987/02/20/world/pakistan-s-nuclear-aims-worrying-us.html.