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➤ EDITOR'S NOTE

The quarter just gone by has been extremely tumultuous, with some earth-shaking events having taken place around the globe – not the least of which was the shock exit of defending champions Germany in the group stage of the ongoing FIFA World Cup. To recount some of these events: trade wars begin between the US and China as Beijing's policies to tie trade to access to emerging technologies appears to be the main complaint President Trump has against China¹; President Donald Trump pulls out of the Iran nuclear deal on May 8, and imposes 'powerful' sanctions on Iran; the historic meeting between President Trump and North Korean President Kim Jong-un finally takes place in Singapore where, in the Joint Declaration, the US and the Democratic Republic of Korea (DPRK) commit to work together to build a lasting and stable peace regime on the Korean Peninsula, and the DPRK commits to the complete denuclearisation of the Korean Peninsula (in keeping with the spirit of the April 27, 2018 Panmunjom Declaration); President Trump refuses to sign the Joint Communiqué after the G-7 Summit ended in a row over trade, enough for many to call this year's G-7 Summit a "G-6-Plus-1"; President Trump directs the Department of Defence to begin the process to establish a Space Force as the sixth branch of the US armed forces; and governor's rule is imposed in Jammu and Kashmir (J&K).

Other events in the neighbourhood that are likely to result in a deterioration of the regional security environment comprised the recognition of Jerusalem

1. Treasury Secretary Steven Mnuchin said US regulators will seek to block investment in US technology companies from "all countries that are trying to steal our technology." "Asian Markets Struggle Amid Deepening China-US Trade War Fears", *The Washington Post*, June 26, 2018; https://www.washingtonpost.com/world/asia_pacific/asian-markets-slump-again-amid-deepening-china-u-s-trade-war-fears/2018/06/25/cad47f0c-78e5-11e8-93cc-6d3beccdd7a3_story.html?utm_term=.e8649f460af2. Accessed on June 26, 2018

as the capital of Israel by President Trump, and the cancellation of the US-South Korean military exercises, yet again by President Trump, in a bid to placate Kim Jong-un after their 'historic' meeting in Singapore.

Closer home, the Chinese have not been sitting idle ever since the Doklam standoff ended in August last year. In what has been described as an activity that has the potential to become a flashpoint between India and China, the Chinese have begun mining south of Lhunzhe for gold, silver, rare earths and other minerals, the total value of which has been assessed as over \$ 60 billion. What is disturbing is that this mining activity is taking place barely 35 km from the Line of Actual Control (LAC) in the northeast. In an oblique reference to the egregious actions by China to build runways and other defence infrastructure on the 'reclaimed' disputed reefs and islands in the Spratlys and Paracels, Stephen Chen, writing in the *South China Morning Post* has compared the Chinese mining activity at Lhunzhe – to claim the natural resources of the region, along with its claim that Arunachal Pradesh is 'South Tibet' – as “another South China Sea arising out of the Himalayas”²; something we need to take note of.

This summer issue of the *Air Power Journal* begins with a discussion on India's nuclear doctrine in which **Manpreet Sethi** argues in her article **Massive Retaliation: Is the Threat Less Than Credible?** that nuclear weapons, in view of their damage potential, are best suited for deterrence; also, the credibility of the deterrence lies in the adversary believing that 'massive retaliation' will indeed, be resorted to if nuclear weapons are ever used first by the adversary; it doesn't matter if they are 'tactical' in nature. We are all agreed that the phrase '*tactical nuclear weapon*' is an oxymoron if ever there was one! (This observation, however, appears to have escaped attention in the formulation of the latest Nuclear Posture Review released by the US on February 7 this year).

With no clear definition available on the limits of sovereignty that extend over a nation's air space into space, the arena is open for advanced space-faring nations to exploit this global common to their advantage – paying

2. Stephen Chen, "How Chinese Mining in the Himalayas May Create a New Military Flashpoint with India", *South China Morning Post*, May 20, 2018; <http://www.scmp.com/news/china/society/article/2146296/how-chinese-mining-himalayas-may-create-new-military-flashpoint>. Accessed on June 27, 2018.

scant regard to international law. Development of Anti-Satellite (ASAT) weapons and Ballistic Missile Defence (BMD) capability has the potential for triggering a proliferation in space weapons. Existing space legislations belong to an era when a bipolar world space order existed. With greater number of space-faring nations today, the governance of space has become more challenging. The increased number of private players has only added to the challenge. Although the Outer Space Treaty prohibits the placement of weapons of mass destruction in the orbit of Earth, it does not prohibit the placement of conventional weapons in orbit. Does this not amount to 'legitimising' the weaponisation of space? The obvious question, then, that begs an answer is: "Is space militarised but not weaponised?" One would assume so till we carry out a closer examination of what really constitutes 'weaponisation of space'. **Gp Capt Anand Rao** provides a clarification in his article **Global Implications of Space Weaponisation** wherein he also posits that the threat posed by orbital space debris to space-based assets is possibly the real – and only – reason for a 'go slow' in weaponisation of space.

The use of drones for aviation terrorism was a subject that was examined by this Centre and presented during the National Security Guards (NSG) Aviation Security Seminar on July 7, 2017. A few key technologies that could be utilised by militant organisations to execute their missions using aviation assets were presented. The attack on a Russian air base in Syria on January 6 this year, using a swarm of thirteen drones, apart from being a vindication of the study carried out by the Centre for Air Power Studies (CAPS), was a chilling reminder that air bases are no longer a safe sanctuary for aircraft – civil or military – and a constant vigil is, therefore, needed for combating this new threat. It is refreshing to see that **Gp Capt Asheesh Shrivastava** has examined some of the aviation threats in greater detail in his article **Mass Attack by Drones: Facing the Challenge** wherein he has outlined a few immediate steps to protect against this threat to military and civil infrastructure.

During the early Sixties – at the height of the Cold War – people in the US tended to live in perpetual fear of an impending nuclear attack. This was identified by the US government as being harmful to their health and well-being. It was, therefore, felt that education on actions to mitigate the

harmful effects of nuclear radiation would prove more useful. However, a majority of the population – both in the US as well as in the UK – was loath to listen to such advice; their clarion call – especially in the UK – appeared to be that the best defence against a nuclear attack was not to possess nuclear weapons, thus, pitching for universal nuclear disarmament. **Wg Cdr Rohit Kaura** assesses the approaches to nuclear civil defence at the national level in his article **National Approaches to Nuclear Civil Defence: An Assessment**.

Despite India being a non-signatory to the nuclear Non-Proliferation Treaty (NPT), the signing of the agreement on July 20, 2017, between India and Japan on civil nuclear cooperation was nothing short of historic – especially in view of Japan's strong condemnation of India after the Shakti-2 tests in May 1998. **Piyush Ghasiya**, in his article **India-Japan Civil Nuclear Cooperation: The Journey and its Future** traces the individual journeys of both nations in the civilian usage of nuclear power and their individual positions on nuclear disarmament. He rounds up the article with the challenges that lie ahead for both nations to make the agreement a success.

The reimposition of sanctions on Iran by President Trump following the US' withdrawal from the Iran nuclear deal has only served to bring Iran and Russia closer, despite these two nations' historical mistrust of each other. **Anu Sharma**, in her article **Iran and Russia: Building a Strategic Partnership**, discusses the building blocks of the strategic partnership between Iran and Russia and analyses how Iran seeks preeminence in the West Asian region, while Russia seeks to thwart US designs to remove Syria's Bashar al-Assad from power.

The Central Asian Republics (CARs) have, for centuries, been at the crossroads for flow of goods between Europe and Asia. It was also the region where the Great Game was played between Russia and Great Britain for most of the nineteenth century. The Belt and Road Initiative (BRI) by China in the present times has revived memories of years gone by and is increasingly being referred to as the 'New Great Game' with Chinese characteristics. India's land borders with the CARs lie through the Gilgit Baltistan region (presently under illegal occupation by Pakistan) that borders the Wakhan Corridor. To overcome this 'connectivity dilemma' India joined the Ashgabat

Agreement on February 1, 2018, and secured its connectivity to the resource and oil rich Central Asian region. **Poonam Mann**, in her article **Connectivity: A Major Constraint in India's Engagement with Central Asian Republics**, explores how India plans to improve its connectivity with the CARs.

The intelligence agencies of states have often been glamorised by Hollywood through the '007' series of movies, in which James Bond is the archetypal Secret Service agent belonging to the MI-6, the foreign intelligence service of the UK. The other well-known secret service agencies are the CIA, KGB, Mossad and Directorate General for External Security (DGSE) of France. Little, however, is known about China's secret service, popularly dubbed 'China's CIA' among counter-intelligence agencies around the world. Apart from the cloak and dagger stuff – which is the preserve of the Ministry of Public Security – the entire panoply of Electronic Intelligence (ELINT), Signals Intelligence (SIGINT), Human Intelligence (HUMINT) and Cyber (both offensive as well as defensive) is handled by the Military Intelligence Department of the People's Liberation Army (PLA). This capability is seen as being crucial for prosecuting successful operations “under conditions of informationalization and Integrated Networked Electronic Warfare”. Ground stations provide assistance to China's Haiyang series of satellites to ensure accurate maritime observation. Apart from four ground stations in Mainland China, there are three ground stations located at strategic points in foreign lands in areas through which bulk of the Chinese commercial vessels transit. The resultant maritime domain awareness (with the help of these ground stations) is crucial for safeguarding these assets from enemy action. These ground stations are located in Kenya, Namibia and Pakistan (Karachi). In the last article of the journal titled **China's Military and Satellite Intelligence Programme**, which covers heretofore uncharted ground – and, therefore, makes for some fascinating reading – **Dhrubajyoti Bhattacharjee** explores this subject in great detail.

Happy reading



MASSIVE RETALIATION: IS THE THREAT LESS THAN CREDIBLE?

MANPREET SETHI

Nuclear weapons are called Weapons of Mass Destruction (WMDs) owing to their damage potential and this makes them best suited for deterrence. Their use, except in a situation where the adversary does not possess nuclear weapons, can never result in the achievement of a political objective without incurring substantial harm to self. The weapons, therefore, serve the paramount objective of stopping use of similar weapons or the prospect of blackmail by holding out the threat of reciprocal retaliation to nullify any gains of first use.

In trying to understand the dynamics of how deterrence functions, several important questions need to be answered. How should one articulate the threat of retaliation? What deters better: the threat of punishment which would signal attacks on civilian targets to cause large scale, massive damage? Or, the threat of attacks on military targets that would relatively limit the damage to the population, but cause attrition to retaliatory nuclear forces?

Since credibility lies at the heart of deterrence, it is necessary that the kind of retaliation being promised should seem believable to the adversary. He must be convinced that the threat is capable of being carried out by the country making the threat. This could be made evident through the possession of the requisite capability and the indication of firm resolve to carry out the threat to cause the kind of damage that has been signalled. If

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the adversary believes that retaliation of the kind that has been promised is not likely to be executed by the maker of the threat, then the credibility of the deterrence would fall, increasing thereby the chances of deterrence breakdown. Hence, it is critical to promise the right kind of retaliation to ensure credible deterrence. Or, in other words, the credibility of the threat is central to the credibility of deterrence.

So, what makes for a credible threat – large scale, massive nuclear retaliation, or limited, restricted

nuclear retaliation? A debate on this issue started in India in 2003 soon after the Press Note issued by the Cabinet Committee on Security described the Indian response to a nuclear attack as being “massive and designed to inflict unacceptable damage”. It may be recalled that an earlier draft nuclear doctrine made public on August 17, 1999, had qualified retaliation as “punitive” to inflict damage unacceptable to the aggressor.

The change in terminology was immediately noticed by nuclear analysts and legal eagles. Scrutiny of the revision began in earnest to check how it would add to, or detract from, the credibility of India’s nuclear deterrence. Analysts have also tried to conjecture on the reasons for the change. It has been surmised that it came about as a result of the sense of frustration after Operation *Parakram*, the military operation that India had mounted in response to the attack on the Parliament in December 2001. The operation wound down without any worthwhile military objective being met. It was in the wake of this sentiment that the adoption of massive retaliation came about as one way of conveying greater toughness to the adversary through the use of the word ‘massive’ to describe the nature of retaliation. This may also be recalled to be the time when the neo-conservative Republicans were in power in the US and they were increasing the fashionability of more military

oriented national security strategies. India may have been influenced by this trend too.

Whatever may have been the government's reasons to make this change in doctrinal language, its impact on the credibility of deterrence came to be widely described as being negative.¹ It has been expressed that the suggestion of massive retaliation constrains India's options to only "all or nothing". This dilemma has been felt to have become more acute with Pakistan having thrown in the gauntlet of 'Tactical Nuclear Weapons' (TNWs) into the nuclear rink. Writings have opined that India will not have the willingness

or the courage to undertake massive retaliation if Pakistan were to use a low yield nuclear warhead on Indian military targets, whether on Indian territory or its own. It is argued that it is not in India's nature to inflict large scale civilian casualties. Pakistan certainly assumes that the damage caused by its use of TNWs would be too low to provoke India into undertaking massive retaliation. And even if India was so inclined, the international community would certainly restrain India from doing so. Thus, the asymmetry between the use of tactical nuclear weapons and a response in the form of massive retaliation is supposed to have made India's deterrence posture less than credible.

This article examines the credibility quotient of Massive Retaliation (MR) as rooted in the Indian understanding of the purpose of nuclear weapons. It explores the circumstances in which the US adopted, and then abandoned, the strategy of massive retaliation since it found it less than credible. Should the same logic necessarily apply to India too? Are there any factors that make

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1. For some critical analyses of this aspect, see Arka Biswas, "Credibility of India's Massive Retaliation", *Science, Technology and Security Forum*, January 7, 2017. Available at <http://www.stsfor.org/content/credibility-indias-massive-retaliation>; Firdaus Ahmed, "Will Modi Relook at 'Massive' Retaliation in India's Nuclear Doctrine?", *India Together*, June 25, 2014. Available at <http://indiatogether.org/modi-relook-at-massive-retaliation-in-nuclear-doctrine-op-ed>; Shashank Joshi, "India's Nuclear Anxieties: The Debate Over Doctrine", *Arms Control Today*, May 2015.

MR more credible in the case of India as compared to how the US considered it? The paper suggests three such differences. Additionally, it attempts a definition of massive retaliation in the Indian context. Must MR be nothing less than “all you have got” to qualify for being massive? Is ‘massive’ a function of the nuclear ordnance dropped on the adversary, or of the damage caused? Can an impact that is massive even with the use of a minimum number of missiles and warheads also qualify as massive retaliation? Not much strategic analysis in India has devoted adequate attention to these questions. This paper is a modest attempt to give a distinctly Indian flavour and understanding to a much discredited concept in the Western nuclear discourse. As the paper argues, the Indian circumstances and nuclear challenges are unique, warranting a distinctly Indian strategy or an Indian definition of terminologies that may have long existed in global nuclear literature.

MASSIVE RETALIATION IN US NUCLEAR STRATEGY

The concept of MR was first introduced in the US’ nuclear strategy in 1954 through a speech made by John Foster Dulles, secretary of state in the administration of President Dwight Eisenhower. This strategy envisaged massive, preemptive use of strategic weapons to deter and prevail. It offered an indiscriminatory threat of massive nuclear strike in response to any Communist aggression, small or big. As Dulles explained, “Our capacity to retaliate must be, and is, massive in order to deter all forms of aggression.” He recommended, therefore, the build-up of a “deterrent of massive retaliatory power that would have the capacity to retaliate instantly, by means and at places of our choosing”. This strategy relied on a “large, preordained strategic nuclear response against thousands of targets throughout the Communist world in the event of a Soviet aggression.”²

The inference here was that the American response would not be confined to the point of attack. Rather, the fighting could well spread beyond the limits and methods selected by the adversary. Clearly, the signal was to deter the USSR by the threat of American action spilling far beyond what the adversary

2 Francis Gavin, *Nuclear Statecraft: History and Strategy in America’s Atomic Age* (Ithaca & London: Cornell University Press, 2012), p. 112.

might have imagined. The USSR was, thus, being cautioned from taking any aggressive step since the chances of escalation of a disproportionate nature were very high and would nullify any gains the Soviets hoped to achieve. So, the US' emphasis was on the high order of its own retaliation irrespective of the nature of the Soviet action. As US President Eisenhower opined, once political actions were replaced by military responses, "there are really no limits that can be set to the use of force." Drawing upon the game of poker, he argued, "In order to avoid beginning with the white chips and working up to the blue, we should place them on notice that our whole stack is in play."³ Vice President Nixon too seemed to weigh in with similar thoughts when he said in March 1954, "Rather than let the Communists *nibble us to death* all over the world in little wars, we would rely in the future primarily on our massive mobile retaliatory power which we could use at our discretion against the major source of aggression at times and places that we choose."⁴ Frustration over the stalemate in the Korean War had made the US lose its appetite for small wars which were perceived as being unpopular and expensive. Nuclear weapons, on the other hand, came to be projected as a real and usable military option that was far less costly and more efficient compared to rearming a large standing army and undertaking thousands of air raids.

Evidently then, the views expressed by President Eisenhower, his Vice President Nixon, and his Secretary of State Dulles leaned towards the projection of a policy that was far more muscular. However, this policy suffered from not being anchored in adequate capability and policy changes. As Freedman has explained, "This was not the Administration's actual policy as set out in NSC-162/2 but was an impression easily taken from Dulles' statements on reinforcing local defences by the further deterrent of massive retaliatory power. In order to provide some clarification on the issue, Dulles wrote an article in *Foreign Affairs* in April 1954 in which he acknowledged that "massive atomic and thermonuclear reaction is not the kind of power which could most usefully be evoked under all circumstances." He clarified that the new policy

3. Ibid., p. 65.

4. As cited by Lawrence Freedman, *The Evolution of Nuclear Strategy* (New York: Palgrave Macmillan, 2003), p. 81. Emphasis added.

In the US' formulation, MR indicated the country's readiness to launch nuclear weapons "at almost any Communist affront". This was seen as highly unlikely to happen in practice.

was not "turning every local war into a world war", and that its objective was simply to prevent such wars by making them too risky.

By the late 1950s, however, a number of critics of the idea of massive retaliation had begun to put forth considered arguments in many publications. William Kaufmann, for instance, edited a collection of essays, *Military Policy and National Security*, in which he raised the issue of the credibility of massive retaliation.

Speaking in the context of the USA, he opined that the adversary normally uses three sources of information to judge the likelihood of response: the statements and behaviour of the government; the attitudes of public opinion; and the government's performance in comparable contingencies. Based on this analysis, he found that it would be out of character for the US to retaliate massively and, hence, the adversary was likely to see the threat as incredible. In the US' formulation, MR indicated the country's readiness to launch nuclear weapons "at almost any Communist affront".⁵ This was seen as highly unlikely to happen in practice.

Massive retaliation, therefore, came to be described as being neither credible in action, nor an intelligent strategy. It came to be associated with the 'suicide or surrender' dilemma. As opined by one analyst, "The gross disproportionality between means and ends would prove inhibiting for moral and political reasons, and the threat of massive retaliation would suffer in credibility."⁶ Its lack of credibility was also pointed out in the context of the US' extended deterrence commitments. For instance, analysts expressed their incredulousness at the possibility that *any* Communist provocation in Europe would elicit a massive response from the US given that such a response would immediately place the US mainland in the Soviets' nuclear crosshairs. The Americans felt that the promise of such an action, without consideration of the consequences, could lead to policy paralysis. Meanwhile, the allies felt that the

5. Gavin, n. 2, p. 30.

6. Ibid., p. 6.

promise of such an action would unnecessarily drag them into a nuclear war even over 'minor' issues of peripheral concern to them. Therefore, neither the provider of the nuclear umbrella, nor the recipients found massive retaliation an intelligent strategy. Rather, both sides feared that it could incentivise the adversary into undertaking a massive first strike since the retaliation being promised in any case, irrespective of the first action, was going to be massive.

In order to enhance the credibility of the threat in the face of such criticism, scholars like Robert Osgood tried to popularise the idea of limited war in 1957. The objective was to reestablish the effective use of military force as a rational instrument of policy. This was sought to be done by suggesting that "means of deterrence be proportionate to the objectives at stake."⁷ Influenced by such views and exuding a new confidence with the emergence of second strike weapons in the form of submarine launched ballistic missiles and inter-continental ballistic missiles, and a determination to achieve numerical superiority, President Kennedy abandoned MR in favour of the more nuanced Flexible Response (FR). This included "an array of nuclear packages, calibrated military responses, and more robust conventional force options up and down the escalatory ladder."⁸ It was meant to provide decision-makers with less extreme and more sophisticated nuclear use options and the ability to deploy effective forces on any rung of the escalation ladder. A direct consequence of finding ways to reduce reliance on MR was advocacy of a build-up of conventional forces. Additionally, emphasis was placed upon conceptualising, and planning for, the conduct of limited strategic retaliation. This emphasised flexibility in the choice of military targets

A direct consequence of finding ways to reduce reliance on MR was advocacy of a build-up of conventional forces. Additionally, emphasis was placed upon conceptualising, and planning for, the conduct of limited strategic retaliation. This emphasised flexibility in the choice of military targets and missions.

7. Robert Endicott Osgood, *Limited War: The Challenge to American Strategy* (University of Chicago Press, 1957), p. 26.

8. Gavin, n.2, p. 4.

and missions. The idea was to conceive of politically and militarily plausible options that could contain a nuclear war in such a way that tens of millions of people would not be killed since that was considered immoral and, hence, of questionable credibility. So, the US proclaimed that it would not strike at Soviet cities but would attack military targets instead, preferably those away from population centres, such as missile sites, bomber bases or command and control centres. But, in case there was Soviet retaliation on American cities, then similar attacks would follow. So, city avoidance was central to the US' 'controlled' response. But, this turned out to be a one-way conversation of the US with itself since, after its military sites had been attacked, it was hardly imaginable that the USSR would not respond with nuclear weapons. In any case, it was established even then that distinction between targets was not easy and neither would the wind blowing in different directions help maintain the distinction between targets deliberately hit and those that came to bear the brunt of the radioactive fallout.

Yet, several proponents persisted with the concept of the feasibility of limited nuclear war and argued that such a deliberate attack could be undertaken by limiting the total amount of damage threatened, planned and done by choosing the targets accordingly. A limited nuclear attack was seen as showcasing a small sample of the destruction potential in order to precipitate bargaining towards an agreed termination of hostilities before they escalated into an uncontrolled orgy of destruction. In the 1960s, it was believed that "limited strategic war is a *possible* war; to fight and prepare for such a war is a *possible* strategy."⁹ Such a war was conceived of in the context of the "process of bargaining".¹⁰ Rather bizarrely, it was thought that "at one extreme along this dimension, there will be negotiations during the pre-attack phase; in the middle range of the entire spectrum is the case of continuous and intensive negotiations punctuated occasionally by a limited strategic attack."¹¹ The near impossibility of executing this in the real world was starkly brought out when a crisis actually came in the form of Soviet missiles in Cuba. Then, President

9. Ibid., p. 6. Emphasis in original.

10. Ibid., p. 16.

11. Ibid, p. 16.

Kennedy discarded all the carefully constructed aspects of McNamara's flexible response doctrine to reinvoke massive retaliation. He warned the USSR that even a single missile launched from Cuba at any point in the Western hemisphere would "unleash the full retaliatory might of the US".¹²

President Nixon, in the early 1970s, reverted to the pursuit of greater counter-force capabilities for more flexible strategic options. He said, "I must not be, and my successor must not be, limited to the indiscriminate mass destruction of enemy civilians as the sole possible response to challenges..." The idea was to move from a single, all-out nuclear attack toward a policy of controlled discriminate war. James Schlesinger, his secretary of defence in 1973, was a strong votary of developing accurate missiles for counter-force targeting that allowed "selectivity and flexibility".¹³ He constructed a premise that if "the Soviets destroyed the US submarine base at Groton, Connecticut, we should be able to retaliate against a similar target such as their counterpart at Murmansk." Under the spell of the idea of limited nuclear war, US strategic thinkers did for a time consider the Soviet propensity for all-out war rather patronisingly by suggesting that "Soviet military doctrine does not seem to have reached as yet the third stage of the *evolution of strategic thought* with respect to nuclear weapons: *that of finding subtler uses for the new technology than all out war.*"¹⁴ They believed that their approach was actually "seeking more humanitarian nuclear alternatives"¹⁵, though it really was a push for a more lethal policy.

In fact, the question that quickly raised its head was whether it was possible at all to control and direct nuclear forces to execute a graduated or controlled nuclear response in a crisis? Many scholars pointed out that this would call for hugely sophisticated technological forces not just in nuclear numbers and types of weapons, but also planning and command and control capability. This obviously required the nation to invest in a large amount of first strike counter-force weapons of high precision and accuracy. It also

12. Philip Windsor, *Strategic Thinking: An Introduction and Farewell* (Boulder, Colorado: Lynne Rienner, 2006), pp. 68-69.

13. Robert C Aldridge, *First Strike: The Pentagon's Strategy for Nuclear War* (London: Pluto Press, 1983), p. 33.

14. Henry Kissinger, *Nuclear Weapons and Foreign Policy* (New York: Harper, 1957), p. 389. Emphasis added.

15. Aldridge, n. 13, p. 31.

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demanded second strike counter-force weapons to signal more damage inflicting capability. “When McNamara first asked the Joint Chiefs of Staff (JCS) to prepare a doctrine that permitted controlled response and negotiation pauses, they replied it could not be done”¹⁶ due to “technical constraints”, as the US did not have the necessary planning and command control capability. “Only in a crudely descriptive and admittedly arbitrary sense would it be possible to say where limited strategic war ends and ‘unlimited’ general war begins”.¹⁷ In fact, over the years, most military commanders have admitted that

“any nuclear war, however, limited the original scope might be, would very rapidly run out of control and speed up the escalation to Armageddon.”¹⁸

Besides the huge financial and technological investment that this strategy needed, William Kaufmann, also underlined the *implausibility* of civilians surviving such a war. Reviewing Henry Kissinger’s work on limited war with the use of tactical nuclear weapons, he wrote, “In his version of warfare, airmen do not get panicky and jettison their bombs, or hit the wrong targets, missiles do not go astray, and heavily populated areas – whether rural or urban – do not suffer thereby. Surely this is wishful thinking.”¹⁹ It was clear that the use of TNWs would make the fog of war even more dense. Freedman rightly described these as “battles of great confusion; the casualties would be high; troops would be left isolated and leaderless; and morale would be hard to maintain. It would be difficult to ensure uncontaminated supplies of food and water or even of spare parts, The Army found it extremely

16. Gavin, n.2, p. 34.

17. Klaus Knorr and Thornton Read eds., *Limited Strategic War* (London: Pall Mall Press, 1962), p. 5.

18. Windsor, n. 12, p. 69.

19. As cited by Freedman, n.4, p. 104.

difficult to work out how to prepare soldiers for this sort of battle and to fight it with confidence.”²⁰ As this realisation seeped in, it is hardly surprising that some time in the early 1980s, McGeorge Bundy made the claim that he and others in policy-making positions were assiduous propagators of the fallacy of usable nuclear superiority.²¹ Since then, US nuclear strategy has built its credibility around the concept of assuredness of retaliation to cause unacceptable damage. It neither refers to massive retaliation nor explicitly to FR. The signalling has been to indicate that no action that the US wanted deterred would go unanswered and the answer would depend on the US’ choice at a given moment.

India has clarified that it would not be the first to introduce nuclear weapons and the decision is only to retaliate after nuclear use has been initiated by the adversary. Retaliation to cause punishment in such case certainly sounds more credible and legitimate to execute than the US threat of MR to any kind of provocation.

MASSIVE RETALIATION IN INDIA’S NUCLEAR STRATEGY

The USA abandoned MR on the premise that it sounded incredible to the adversary and unacceptable to its allies. Also, it was influenced by a wave of thinking that sought to make deterrence more credible by showcasing the possibility of limited nuclear war-fighting over city-busting. Does this logic of abandonment of MR and adoption of FR apply to India? Three basic differences in the US and Indian articulations are easily discernible.

The first of these relates to the issue of nuclear doctrines. The US had a first use nuclear doctrine. With this, MR was supposed to be in response to any provocation, anywhere, including a conventional attack far away from the US mainland. As explained earlier, this looked incredible to execute and did not appeal to either the domestic constituency or the allies. In contrast, India has a No First Use (NFU) doctrine. It clearly states that “nuclear retaliation to a first strike will be massive...” Two things are worth highlighting in this

20. Ibid., p. 104.

21. As cited by Gavin, n.2, p. 36.

statement. One, in nuclear parlance, first use is different from first strike. As typically understood, first strike would be a large, coordinated strike from the adversary hitting out at Indian counter-force and counter-value targets. It is unthinkable that retaliation to such a strike could be anything less than massive. The second aspect relates to the fact that India's action of massive retaliation would be in response to a situation in which own territory or troops would have first suffered a nuclear attack. India has clarified that it would not be the first to introduce nuclear weapons and the decision is only to retaliate after nuclear use has been initiated by the adversary. Retaliation to cause punishment in such case certainly sounds more credible and legitimate to execute than the US threat of MR to any kind of provocation even when it was at the conventional level and irrespective of its scale.

The second difference lies in the very approach of India and the US to the purpose of nuclear weapons. In the decades of its early build-up of nuclear capability, the USA considered these weapons as tools of war-fighting. Deterrence was, therefore, premised on the ability to engage militarily with nuclear weapons in order to fight and prevail in a nuclear exchange. This was also the reason that once MR was discredited for being incredulous, the US moved to the strategy of FR. If MR had made it difficult to use nuclear weapons, this new strategy made it easier to contemplate their use. In fact, the whole idea behind flexible response was to indicate the usability of these weapons by projecting the American ability to execute and prevail in a limited nuclear war.

Averse to this idea, India has maintained that the only purpose of nuclear weapons is deterrence, and it seeks to project deterrence through the threat of punishment, and not denial. Hence, it has eschewed war-fighting doctrines. India believes that it is not possible to protect or defend the nation through the use of nuclear weapons since, with a nuclear armed adversary, nuclear retaliation will also be certain. A 'limited nuclear war' would be difficult, if not impossible, to contain and is an oxymoron. The US could contemplate (if only by some and for a short period) conduct of limited strategic exchanges primarily because these were anticipated in third countries. But, in the case of India, even a so-called limited

war would be fought on its own territory, and even such a war would spell huge human, financial and environmental costs to the nation. The idea, therefore, is not to move to a flexible nuclear response, but to deter through the promise of a disproportionate response, as spelt out in the massive retaliation strategy. The purpose of India's nuclear strategy is to make the possibility of use of nuclear weapons as remote as possible. The US tried to enhance the credibility of its deterrence by highlighting the usability of these weapons in a controlled fashion. India, in contrast, seeks to deter by evoking the threat of MR, indicating that the prospect of use of such weapons would end in an unimaginable catastrophe.

The third difference between the US and India on the issue of MR pertains to the nature of the adversary. One of India's adversaries openly exercises brinkmanship as a strategy of deterrence. Pakistan is not interested in strategic stability precisely because its nuclear strategy is premised on deterring an Indian conventional attack that might be triggered by its continued support for terrorism. Since the purpose of Pakistani nuclear weapons is to deter India's conventional capability, it does so by keeping alive the prospect of easy and early use of nuclear weapons. It is a strategy of projected irrationality where the risk of escalation is used to de-escalate.

In the face of such an adversary, MR becomes India's resort to brinkmanship. It holds out the promise of disproportionate escalation in order to prevent Pakistan from exploiting its threat of nuclear use. India seeks to deter nuclear use by maximising the fear of extreme nuclear escalation, or in other words, through the promise of the worst. Just as Pakistan claims it has only a *one rung escalation ladder* which it will be compelled to climb in the case of an Indian conventional attack, India's MR signals a *one rung nuclear escalation ladder*. By doing so, India dismisses the prospect of climbing one level of nuclear war-fighting at a time.

Given the above three reasons, India's MR strategy does not look all that incredulous. However, one other issue needs to be discussed to establish this further. This is in relation to the development of the Nasr, the very short range (60 km) ballistic missile that Pakistan claims to be nuclear capable and for use in the battlefield. According to some Indian strategic analysts, the possibility

If Pakistan was not to exercise brinkmanship, it would lead to stability at the nuclear level and this would constrain its ability to use terrorism. That is possible only if a sense of fear of escalation to the nuclear level is kept alive at all times. And TNWs fit perfectly into this strategy as an instrument of brinkmanship.

of Pakistan's use of TNWs would raise a "serious decision dilemma" for India since "it could make it hard for Indian leaders to find justification for infliction of disproportionate damage to avenge against what limited damage the TNWs could inflict."²²

There is an assumption in this argument that must be dissected. It seems to indicate that India's strategic nature is such that it could not bring itself to inflict massive casualties on the adversary in case the damage caused to its own troops/territory was of a limited nature. So, Pakistan's use of TNW would be too small to provoke India into carrying out massive retaliation and the

Indian leadership would find it hard to "react by wiping out a few cities in Pakistan – besides opening up the escalatory ladder of nuclear exchange culminating into mutual destruction".²³ This then leads to the "incredulity of India's policy of one massive leap of massive response". It is even opined that this actually emboldens Pakistan to engage in nuclear brinkmanship.

This conclusion, however, is an inaccurate view of Pakistan's nuclear strategy that is anyway built on the idea of brinkmanship. If Pakistan was not to exercise brinkmanship, it would lead to stability at the nuclear level and this would constrain its ability to use terrorism. That is possible only if a sense of fear of escalation to the nuclear level is kept alive at all times. And TNWs fit perfectly into this strategy as an instrument of brinkmanship.

22. Gen N C Vij, "Strengthening India's Nuclear Deterrence", in *India*, VIF Perspective: Issues and Trends, 2017 (New Delhi: Wisdom Trees, 2017), p. 7. Similar views may be found in Ajai Shukla, "After a Pakistani TNW Strike, India Can Go for Pakistan's Nuclear Arsenal: Former NSA Shivshankar Menon", *Broadsword*, <http://ajaiashukla.blogspot.in/2017/03/after-pakistani-tnw-strike-india-will.html>, March 18, 2017; and Arka Biswas, "Incredibility of India's Massive Retaliation: An Appraisal on Capability, Cost and Intention", *Comparative Strategy*, vol.36, no.5, pp 445-456.

23. *Ibid.*, p. 7.

As far as India is concerned, Pakistan can voice any assumptions on India's response, but it can never be really sure that India would not respond with massive retaliation. For sure, the response would depend on many factors such as the personality of the leadership at that time, the international context, India's economic position and international stature, etc. But, the question to ask is whether Pakistan could find it prudent to test India with the use of one or a few TNWs? As succinctly put by a former National Security Advisor (NSA) to the Government of India:

It would be incorrect to presume that a limited conventional operation by India to punish Pakistan for an act of terrorism could provoke Pakistan's use of TNW. This is certainly what the Pakistan military planners would like to have India and the world believe, but had this been true, Pakistan would not be investing as much as it is on modernising its conventional military.

If Pakistan were to use tactical nuclear weapons against India, even against Indian forces in Pakistan, it would effectively be opening the door to a massive Indian first strike, having crossed India's declared red lines. There would be little incentive, once Pakistan had taken hostilities to the nuclear level, for India to limit its response, since that would only invite further escalation by Pakistan.... Pakistani tactical nuclear weapon use would effectively free India to undertake a comprehensive first strike against Pakistan.²⁴

In fact, it would be incorrect to presume that a limited conventional operation by India to punish Pakistan for an act of terrorism could provoke Pakistan's use of TNW. This is certainly what the Pakistan military planners would like to have India and the world believe, but had this been true, Pakistan would not be investing as much as it is on modernising its conventional military. It well realises that the war would have to be executed in the conventional realm if the country has to survive after the conflict. Therefore,

24. Shivshankar Menon, *Choices: Inside the Making of India Policy* (Brookings Institution, 2016), p. 174.

it is Pakistan's compulsion to brandish its TNWs to deter India, so long as it continues to use terrorism. This must not lead India to make the wrong inference that the "space left for prosecution of a conventional offensive had purportedly shrunk to inconsequential levels, and, therefore, [it] is left with no option but to sequester India's conventional power and continue to stoically suffer the consequences of Pakistan's proxy war"²⁵. Pakistan's projection of TNW use need not deter India's requirement, if it so arises, to use conventional force to punish Pakistan's use of terrorism.

Now, to answer the argument that India must also build TNWs to respond to Pakistan with similar capability because this would seemingly deter Pakistan better than the threat of MR, it only bears reminding that fighting a war with TNWs is not as easy as it is made to sound. Much of this has been explained in the previous section but just by way of a reminder and to explain the uniqueness of difficulties in the regional context, two points can be highlighted. Firstly, a limited nuclear use could be contemplated, with great difficulty though, if the targets were isolated and their locations known. But in the case of ground warfare, it is more likely that there will be several targets, known and unknown, in a theatre. With industrial facilities, ports and air bases located near fairly big cities, even a counter-force strike could get out of hand and amount to an all-out war.

Secondly, the conduct of a strategic limited war "would make special demands on strategic command and control systems, including sensors that tell the decision-maker what is, and has been, happening."²⁶ This burden on Command and Control (C2) increases as the numbers, dispersal and mobility of strategic weapons increases. Not only is speedy processing of information a critical requirement—so is the need for the politico-military C2 to remain unified. Questions have been raised "will it be at all possible, in this kind of war, to prevent unauthorized acts by military commanders, or to protect the entire structure from top to bottom, both civilian and military components, from interference by unauthorized persons?"²⁷

25. Vij, n. 22, p. 8.

26. *Ibid.*, p. 25.

27. *Ibid.*, p. 26.

Thirdly, as pointed out by Freedman, “Tactical nuclear war, by the very nature of the weapons, has a built in escalation mechanism. It is hardly consistent to argue that nuclear weapons will inevitably be introduced because they are more efficient than conventional weapons and then assume that, once nuclear combat begins, both sides will be content to employ only the least efficient nuclear weapons.”²⁸ TNWs hope to achieve minimum destruction. But their use would certainly engender an unstable situation with a potential for enormous destruction. As Therese Delpech wrote, “Limited wars without escalation may look attractive, but the guarantee that they will remain so is limited as well.”²⁹

Given this inevitability of escalation inherent in the use of TNWs that could decimate Pakistan, it is strange that analysts in India are willing to take the threat of Pakistan’s use of nuclear weapons in the battlefield as credible but they find it incredible that India, even after being struck by nuclear weapons—a use which would have breached a huge psychological threshold—will not be able to carry out MR! In following massive retaliation, India has signalled that it refuses to play the game of tactical/limited nuclear war. Even if the adversary is threatening the use of ‘clean, counter-force, low-yield weapons’, India should express that it would have no option but to respond with its ‘dirty, counter-value weapons’. This makes for credible deterrence.

Yet another criticism of India’s massive retaliation is levelled on account of the possibility that since India is threatening massive retaliation even in the case of use of TNWs, Pakistan could be tempted to conduct a large first strike, in the first instance. So, by suggesting massive retaliation, India could end up inviting a massive first strike and suffer more in the process. This argument completely ignores a very important dimension of the current nuclear reality. There is a sort of a taboo against the use of nuclear weapons that has been in force since 1945. The unacceptability of nuclear use has only strengthened over time and while no legal restriction has been accepted by the nuclear possessing states on the use of nuclear weapons, the psychological weight of such a decision cannot be trivial. Even to approve the use of one weapon is unimaginable and

28. Freedman, n.4, p. 77.

29. Therese Delpech, *Nuclear Deterrence in the 21st Century: Lessons from the Cold War for a New Era of Strategic Piracy* (Santa Monica, CA: Rand, 2012), p. 50.

It may be possible to define massive not just in terms of the amount of arsenal used against the adversary, but in terms of the impact or damage caused thereby. And, massive damage can be caused by using only a few nuclear warheads, intelligently dropped on prudently chosen targets.

to believe that a large scale, coordinated, pre-meditated nuclear strike could be ordered by a rational leader is even more remote. So, India's MR might actually be pushing away the possibility of nuclear use and, thereby, strengthening the case for deterrence, which is the stated objective of its nuclear weapons.

Jervis wrote in 1984 that "states may be able to increase the chance of peace only by increasing the chance that war, if it comes, will be total. To decrease the probability of enormous destruction may increase the probability of aggression and limited wars."

Critics of the war-fighting doctrine argue that decreasing the horrors of nuclear war may tempt states to attack under the mistaken assumption that the costs of the resulting war would be tolerable. Where a situation involves the use of nuclear weapons, it cannot be so, and India's massive retaliation is only underlining the obvious.

DEFINING MASSIVE

As a word in the English language, massive conveys the sense of huge, considerable or gigantic. Used as an adjective with retaliation, it is meant to indicate a very large response. Speaking casually, strategists have used this to describe an all-out response, with a bulk of the nation's nuclear arsenal being used in order to cause unacceptable damage to the adversary.

However, it may be possible to define massive not just in terms of the amount of arsenal used against the adversary, but in terms of the impact or damage caused thereby. And, massive damage can be caused by using only a few nuclear warheads, intelligently dropped on prudently chosen targets that lead to a collapse of the social, economic, political and psychological fabric of a nation. In such case, while the number of weapons used may not qualify as massive, the impact certainly would. Even a modest number of single warhead missiles on counter-value targets would result in horrific consequences, given

the density of population in our region. Therefore, the good news for India's massive retaliation, and one that significantly raises its credibility, is that causing massive retaliation is not very difficult. A moderate nuclear attack will also result in massive casualties and material damage. In fact, most scenarios envisaging the use of nuclear weapons would bring the region to this pass.

Yet another definition of massive retaliation describes it as necessarily hitting out at counter-value targets. For sure, the damage to life and property would be unimaginable and massive. But India could also launch massive retaliation against Pakistan's nuclear arsenal, or against counter-force targets, to massively attrite its retaliatory capability. As stated by Shivshankar Menon, "Pakistan's tactical nuclear weapons use would effectively free India to undertake a comprehensive first strike against Pakistan." So, massive may take many forms, depending on the circumstances, and it has not taken away flexibility from the Indian hands. The promise, or threat, that underlies deterrence is that of unacceptable damage.

CONCLUSION

For weapons of deterrence to meet their objective, it becomes crucial that the adversary *believes* that they would be used if certain thresholds are crossed: making someone believe that a course of action that will be followed depends on the making of threats. The nature of the threat and the manner in which it is made, both are important. A large part of deterrence is based on clear and precise communication of the threats that would follow. As put by one analyst, "It makes no sense to surprise an opponent with unanticipated retaliation when a clear signal could have deterred unwanted activity in the first place."³⁰ Equally important is leadership, and the perception of the firmness of the leader. Therese Delpech was right when she stated, "A reputation for firmness on principles, good judgment and reliability does more to deter than sophisticated nuclear warheads and missiles."³¹

Massive retaliation may be an atrocious strategy to follow once deterrence breaks down, but then it is a paradox that deterrence is built on the threat

30. James J Wirtz, "Deterring the Weak: Problems and Prospects", *Proliferation Papers*, IFRI Security Studies Centre, Fall 2012, p. 7.

31. Delpech, n. 29, p. 88.

Massive retaliation may be an atrocious strategy to follow once deterrence breaks down, but then it is a paradox that deterrence is built on the threat of Armageddon. The effectiveness of the deterrent resides in its certainty and horror. Any attempt to reduce either of these would also reduce the power to deter.

of Armageddon. The effectiveness of the deterrent resides in its certainty and horror. Any attempt to reduce either of these would also reduce the power to deter. Making a credible war-fighting strategy with nuclear weapons is not only difficult but also impossible to guarantee that it would remain limited. Not surprisingly, Shyam Saran, former National Security Advisory Board (NSAB) chairman described limited nuclear war as a “contradiction in terms”. Believing otherwise, in fact, would actually put India into an arms race, and given the limited technological and financial resources

available with the country, that cannot be the best of options.

Meanwhile, MR – or the promise of the worst – has a better chance at deterrence. If perception management is the key to good deterrence, then it would be better to let the adversary believe that there are no half way responses that India has invested in. This would also be financially less taxing and technologically far more within reach. It also seeks to deter the possibility of the use of nuclear weapons which is what India desires in the first place. India considers the use of nuclear weapons unacceptable and unexceptionable. Hence, to any use of the weapon, it has only one response to offer – that is, one of MR. Changing this to anything else would run the risk of encouraging the adversary to test India’s resolve at lower levels. In fact, signalling that India would respond to the use of smaller nuclear weapons at the lower level with similar types of its own would indicate that India was okay with the idea of fighting a low order nuclear battle. India does not want that at all. It seeks to deter the very use of nuclear weapons and that can best be done with the threat of massive retaliation, complemented with a strong show of firm resolve and operational preparedness.

GLOBAL IMPLICATIONS OF SPACE WEAPONISATION

TH ANAND RAO

The paradox of today's world, where peace comes from deterrence and weaponisation; and even outer space, God's sole preserve, has not been left out.

There being no boundary line between 'air space' and 'outer space,' and with no universally or legally accepted demarcation line between the two, it gives a false notion that both these comprise a seamless and contiguous medium. The fallout is conflicting assumptions about the limits of sovereignty. However, most states agree that the sovereignty of a state would end at some point above the Earth, beyond which is the common heritage of mankind, where international law would reign supreme. Does this mean that any space-faring nation is free to explore, exploit and extract the benefits offered by outer space without regard to the future needs of other nations? Will our actions in space, specifically those with military objectives, be acceptable, or will these be monopolised by the advanced space-faring countries. Is there scope for '*responsible behaviour*' in space to preserve the space environment for future generations and protect it from space debris? These are some of the questions which raise the compelling need for enacting stringent laws and regulations governing the use of space.

The use of outer space is fast developing in two major areas. On the one hand, space technology is being used in a variety of roles to upgrade human lifestyles and for social upliftment. On the other hand, there are rapid developments in military applications and towards weaponisation of space for national

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The existing space governance mechanisms belong to the era of the Cold War and the space race between the superpowers of the 20th century. These are mostly non-binding and voluntary to those signatory nations which have ratified the agreements. Also, these agreements cater to the specific issues which arose during the Cold War rivalry.

objectives by a few leading space-faring nations. While the military applications are not a recent phenomenon, it is the increased pace of events like Anti Satellite Weapons (ASAT) testing and Ballistic Missile Defence (BMD) programmes which are a cause of concern due to the potential these offer for the proliferation of space weapons.

EXISTING LEGAL FRAMEWORK AND REGULATORY MECHANISMS FOR SPACE ACTIVITIES

The legal and regulatory framework, also known as space law, much like general international law, comprises a variety of international agreements, treaties, conventions, and United Nations General Assembly (UNGA) resolutions as well as rules and regulations of international organisations. These are embodied in the *five international treaties* and *five sets of principles* governing outer space which have been developed under the auspices of the United Nations (UN). In addition to these international instruments, many states have national legislations governing space-related activities. This legal and regulatory framework addresses a variety of matters such as preservation of the space and Earth environment, liability for damages caused by space objects, settlement of disputes, rescue of astronauts, sharing of information about potential dangers in outer space, use of space-related technologies, and international cooperation. A number of fundamental principles guide the conduct of space activities, including the notion of space as the province of all mankind, freedom of exploration and use of outer space by all states without discrimination, and the principle of non-appropriation of outer space.¹

1. "Space Law", at <http://www.unoosa.org/oosa/en/ourwork/spacelaw/index.html>. Accessed on April 10, 2018.

The existing space governance mechanisms belong to the era of the Cold War and the space race between the superpowers of the 20th century. These are mostly non-binding and voluntary to those signatory nations which have ratified the agreements. Also, these agreements cater to the specific issues which arose during the Cold War rivalry. Though enacted during the 1960s and 1970s, these treaties have not been reviewed, but still form the basis for all guidelines and draft treaties today. The five core treaties were all negotiated through the UN Committee on the Peaceful Uses of Outer Space (UNCOPUOS), a UN body created in 1958. The treaties, being generic, have left room for varied interpretation. In order to understand the implications of these treaties, a brief outline of the treaties is necessary.

The Outer Space Treaty (OST) is the primary legal instrument and the basis for all future treaties. It was founded on the principle of 'peaceful use' of outer space. The OST provides the basic framework on international space law.

INTERNATIONAL TREATIES AND AGREEMENTS

- **The Outer Space Treaty of 1967:** Also called the Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies, the Outer Space Treaty (OST) is the primary legal instrument and the basis for all future treaties. It was founded on the principle of 'peaceful use' of outer space. The OST provides the basic framework on international space law, and includes the following principles²:
 - The exploration and use of outer space shall be carried out for the benefit, and in the interests, of all countries and shall be the province of all mankind.
 - Outer space shall be free for exploration and use by all states.
 - Outer space is not subject to national appropriation by claim of sovereignty, by means of use or occupation, or by any other means.

2. "Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies", at <http://www.unoosa.org/oosa/en/ourwork/spacelaw/treaties/introouterspacetreaty.html>. Accessed on April 10, 2018.

- States shall not place nuclear weapons or other weapons of mass destruction in orbit or on celestial bodies or station them in outer space in any other manner.
- The Moon and other celestial bodies shall be used exclusively for peaceful purposes.
- Astronauts shall be regarded as the envoys of mankind.
- States shall be responsible for national space activities whether carried out by governmental or non-governmental entities.
- States shall be liable for damage caused by their space objects.
- States shall avoid harmful contamination of space and celestial bodies.

The OST consists of 17 Articles mainly dealing with exploration of outer space, international cooperation, sharing of benefits and an embargo on the placement and testing of nuclear weapons in space.

- **The Rescue Agreement, 1968:** Also called the “Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Objects Launched into Outer Space”, the Rescue Agreement, elaborates on elements of Articles V and VIII of the Outer Space Treaty, and provides that states shall take all possible steps to rescue and assist astronauts in distress and promptly return them to the launching state, and that states shall, upon request, provide assistance to the launching states in recovering space objects that return to the Earth outside the territory of the launching state.³
- **The Liability Convention, 1972:** Also called the “Convention on International Liability for Damage Caused by Space Objects”, elaborating on Article 7 of the Outer Space Treaty, the Liability Convention provides that a launching state shall be absolutely liable to pay compensation for damage caused by its space objects on the surface of the Earth or to aircraft, and be liable for damage due to its faults in space. It also provides for procedures for the settlement of claims for damages.⁴

3. “Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Objects Launched into Outer Space”, at <http://www.unoosa.org/oosa/en/ourwork/spacelaw/treaties/introrescueagreement.html>. Accessed on April 11, 2018.

4. “Convention on International Liability for Damage Caused by Space Objects”, at <http://www.unoosa.org/oosa/en/ourwork/spacelaw/treaties/introliability-convention.html>. Accessed on April 11, 2018.

- **The Registration Convention, 1975:** Also called the “Convention on Registration of Objects Launched into Outer Space”, the Registration Convention was considered, and negotiated, for building upon the desire expressed by states in the Outer Space Treaty, the Rescue Agreement and the Liability Convention to make provision for a mechanism that provided states with the means to assist in the identification of space objects. The Registration Convention expanded the scope of the United Nations Register of Objects Launched into Outer Space that had been established by Resolution 1721B (XVI) of December 1961 and addressed issues relating to a state’s responsibilities concerning its space objects.⁵
- **The Moon Agreement, 1979:** Also called the “Agreement Governing the Activities of States on the Moon and Other Celestial Bodies”, the Moon Agreement was considered and elaborated by the Legal Subcommittee from 1972 to 1979. The Moon Agreement was adopted by the General Assembly in 1979 in Resolution 34/68. It was not until June 1984, however, that the fifth country, Austria, ratified it, allowing it to enter into force in July 1984. The Moon Agreement reaffirms and elaborates on many of the provisions of the Outer Space Treaty as applied to the Moon and other celestial bodies, providing that those bodies should be used exclusively for peaceful purposes, that their environments should not be disrupted, and that the United Nations should be informed of the location and purpose of any station established on those bodies. In addition, the agreement provides that the Moon and its natural resources are the common heritage of mankind and that an international regime should be established to govern the exploitation of such resources when such exploitation is about to become feasible.⁶

5. “Convention on Registration of Objects Launched into Outer Space”, at <http://www.unoosa.org/oosa/en/ourwork/spacelaw/treaties/introregistration-convention.html>. Accessed on April 11, 2018.

6. “Agreement Governing the Activities of States on the Moon and Other Celestial Bodies”, at <http://www.unoosa.org/oosa/en/ourwork/spacelaw/treaties/intromoon-agreement.html>. Accessed on April 11, 2018.

The status of ratification of these treaties is summarised below (Table 1)⁷:

Table 1

Treaty	Entry into Force	Signatory Countries	Countries Ratified
Outer Space Treaty	October 10, 1967	23	107
Rescue Agreement	December 3, 1968	23	96
Liability Convention	September 1, 1972	19	95
Registration Convention, 1975	September 15, 1976	03	67
Moon Agreement, 1979	July 11, 1984	04	18

LEGAL PRINCIPLES

- **The “Declaration of Legal Principles”**: This is also called the “Declaration of Legal Principles Governing the Activities of States in the Exploration and Uses of Outer Space”, and was adopted vide General Assembly Resolution 1962 (XVIII) of December 13, 1963. These principles stipulate that exploration and use of outer space shall be carried out for the benefit, and in the interests, of all mankind. Outer space and celestial bodies are free for exploration and use by all states on a basis of equality and in accordance with international law. These are not subject to national appropriation by claim of sovereignty, by means of occupation, or by any other means. The activities of states in the exploration and use of outer space shall be carried out in accordance with international law.⁸
- **The “Broadcasting Principles”**: This is also called the “Principles Governing the Use by States of Artificial Earth Satellites for International Direct Television Broadcasting”, and was adopted vide General Assembly Resolution 37/92 of December 10, 1982. The principle states that every state has an equal right to conduct activities in the field of international direct television broadcasting by satellite and to authorise such activities

7. “Status of International Agreements Relating to Activities in Outer Space as at January 1, 2018”, at http://www.unoosa.org/documents/pdf/spacelaw/treatystatus/AC105_C2_2018_CRP03E.pdf. Accessed on April 11, 2018.

8. “1962 (XVIII). Declaration of Legal Principles Governing the Activities of States in the Exploration and Use of Outer Space,” at <http://www.unoosa.org/oosa/en/ourwork/spacelaw/principles/legal-principles.html>. Accessed on April 12, 2018.

by persons and entities under its jurisdiction. All states and peoples are entitled to, and should, enjoy the benefits from such activities. Access to technology in this field should be available to all states without discrimination, on terms mutually agreed by all concerned.⁹

- **The “Remote Sensing Principles”:** Also called the “Principles Relating to Remote Sensing of the Earth from Outer Space”, it was adopted in the General Assembly Resolution 41/65 of December 3, 1986. It states that remote sensing activities are to be carried out for the benefit, and in the interests, of all countries, irrespective of their degree of economic, social or scientific and technological development, and taking into particular consideration the needs of the developing countries. States carrying out remote sensing activities are to promote international cooperation in these activities. Remote sensing should promote the protection of the Earth’s natural environment and protect mankind from natural disasters.¹⁰
- **The “Nuclear Power Sources” Principles:** Known as the “The Principles Relevant to the Use of Nuclear Power Sources in Outer Space”, this was adopted in the General Assembly Resolution 47/68 of December 14, 1992. It was enacted in order to minimise the quantity of radioactive material in space and the risks involved. In accordance with this principle, the use of nuclear power sources in outer space is to be restricted to those space missions which cannot be operated by non-nuclear energy sources in a reasonable way.¹¹
- **The “Benefits Declaration”:** Known as the “Declaration on International Cooperation in the Exploration and Use of Outer Space for the Benefit, and in the Interest, of All States, taking into Particular Account the Needs of Developing Countries”, it was adopted in the General Assembly Resolution 51/122 of December 13, 1996. It says that states are free to determine all aspects of their participation in international cooperation

9. “37/92. Principles Governing the Use by States of Artificial Earth Satellites for International Direct Television Broadcasting,” at <http://www.unoosa.org/oosa/en/ourwork/spacelaw/principles/dbs-principles.html>. Accessed on April 12, 2018.

10. “41/65. Principles Relating to Remote Sensing of the Earth from Outer Space”, at <http://www.unoosa.org/oosa/en/ourwork/spacelaw/principles/remote-sensing-principles.html>. Accessed on April 12, 2018.

11. “47/68. Principles Relevant to the Use of Nuclear Power Sources In Outer Space”, at <http://www.unoosa.org/oosa/en/ourwork/spacelaw/principles/nps-principles.html>. Accessed on April 12, 2018.

While resolutions adopted by the General Assembly are not legally binding, many resolutions dealing with issues related to outer space offer valuable guidance to states on the conduct of space activities.

in the exploration and use of outer space on an equitable and mutually acceptable basis.¹²

GENERAL ASSEMBLY RESOLUTIONS

Every year, the General Assembly adopts a resolution entitled “International Cooperation in the Peaceful Uses of Outer Space”. These resolutions lay out the framework for the deliberations in the Committee on the Peaceful Uses of Outer Space and the activities to be undertaken within the Programme on Space Applications of the Office for Outer

Space Affairs; 130 resolutions have been adopted till date by the UNGA. While resolutions adopted by the General Assembly are not legally binding, many resolutions dealing with issues related to outer space offer valuable guidance to states on the conduct of space activities. Many provisions of the General Assembly resolutions related to outer space have become widely accepted by the international space community, including the resolution elaborating the concept of the “launching state” (59/115), the resolution endorsing the Space Debris Mitigation Guidelines developed by the Committee on the Peaceful Uses of Outer Space (62/217), the resolution enhancing the practice of states in registering space objects (62/101) and the resolution on recommendations on national space legislation (68/74).¹³

OTHER REGULATORY MECHANISMS

In addition to the implementation of international instruments of space law, states have developed national regulatory frameworks to govern the conduct of space-related activities. States that have enacted national space legislations have taken a number of different approaches in dealing

12. “51/122. Declaration on International Cooperation in the Exploration and Use of Outer Space for the Benefit and in the Interest of All States, Taking into Particular Account the Needs of Developing Countries”, at <http://www.unoosa.org/oosa/en/ourwork/spacelaw/principles/space-benefits-declaration.html>. Accessed on April 12, 2018.

13. “Space Law: Resolutions”, at <http://www.unoosa.org/oosa/en/ourwork/spacelaw/resolutions.html>. Accessed on April 12, 2018.

with national space activities. National space legislation can be contained in unified acts or a combination of national legal instruments. Furthermore, some states have adapted their national legal frameworks according to the specific needs and practical considerations of the range of space activities conducted and the level of involvement of non-governmental entities. Besides these, there are many bilateral and multilateral international agreements related to activities in outer space.¹⁴

Today, there are many more space-faring nations, with around 70 countries owning and operating satellites. The governance requirements today are much more diverse and demand a renewed approach to space governance issues.

SHORTFALLS OF EXISTING LEGAL AND REGULATORY FRAMEWORK

As seen from the preceding paragraphs, the existing space legislations belong to an era of a bipolar world space order and cater to the conditions which existed during the Cold War years. Today, there are many more space-faring nations, with around 70 countries owning and operating satellites. The governance requirements today are much more diverse and demand a renewed approach to space governance issues. Negotiations on new treaties like the “Prevention on Placement of Weapons in Outer Space Treaty (PPWT)” and an “International Code of Conduct” as also the UN resolution like “Prevention of Arms Race in Outer Space (PAROS)” have been unsuccessful so far, largely because the leading space-faring nations like the US do not want legally binding instruments for space governance which would curtail their choices for expansion in the space domain. Adding to the dilemma is an increasing number of private players, which has led to commercialisation of space and a proliferation of space capabilities. The dependence on space assets and space applications has become so predominant for space-faring nations that space security has emerged as a priority agenda for these states. The increasing trend towards development

14. “National Space Law”, at <http://www.unoosa.org/oosa/en/ourwork/spacelaw/nationalspacelaw.html>. Accessed on April 12, 2018.

and testing of Anti-Satellite (ASAT) weapons seen in the past decade, is indicative of the ineffectiveness of existing regulatory mechanisms.

The Outer Space Treaty (OST) being the core treaty with a broad international participation of 107 countries to date, needs to be examined to understand the reasons for the state of space militarisation and weaponisation today. A few major observations on the OST and other treaties having a bearing on weaponisation are appended below:

- The OST was negotiated at a time when the two superpowers were the only space-faring nations and the rivalry of the Cold War ensured that neither side got an undue advantage. This adheres to the true spirit of the phrase “space shall be the province of all mankind” as stated in Article I of the OST. Also, Article II prohibits national appropriation by any means, meaning no country can claim any part or the whole of outer space as its own national territory. Many specialists in space law believe that the idea that outer space as a whole is a “province of all mankind” or a “global commons” or what is now popular in international law as the “common heritage of mankind”, is a fallacy in interpretation and application of the law, at least within the jurisdiction of the Outer Space Treaty. If we read carefully enough, it is the exploration and use of outer space – the activities – which are the province of all mankind and not outer space – the spatial vacuum – and that all celestial bodies are not the province of all mankind, the human action to explore and use them is. Now when we dissect the misleading interpretation of calling outer space a common heritage of mankind, we are no longer left with the idea that space is owned by all of us equally or as a global commons; instead, what we are left with is that it is owned by nobody. So, on the one hand, now we have countries aspiring to enact laws which assign rights to space-based natural resources and, on the other, we have a spatial status of outer space as something which is incapable of being owned.¹⁵
- The second most pressing legal challenge in space is really ensuring equitable access to space. With the growing role of private players, space

15. Bayer Goswami, “Legal Challenges in the Evolving Space Order”(paper presented at the course on ‘Space in India’s Foreign Policy’ conducted at NIAS, Begaluru, India, March 19-23, 2018).

is rapidly becoming a competitive domain and market, and with any rapidly growing competitive domain, actions often precede thoughtful regulations and the law lags behind the pace of development. Now Article I, again, also establishes freedom of exploration and use by all states without discrimination of any kind. Scholars have held the view that one state's early access to space cannot be a hindrance to the future interests of non-space-faring nations. Particularly, with the trend of small satellite constellations ranging between 100s to 1000s of satellites in each constellation. Each such constellation could in itself surpass the total number of active satellites which are in orbit around the Earth today. Such rapid progress in space is in sheer contrast with the stagnancy of the regulatory framework in the international space law domain. As an international community, we have not yet been able to form a legally binding international instrument to prevent, and mitigate, the creation of space debris.¹⁶

- The stagnancy in development of legally binding laws or 'hard laws' is another cause for concern. There is a clear shift in trend, particularly in the space domain, to resort to formation of 'soft laws' such as General Assembly resolutions or recommendations which are not legally binding. At the pace at which the space industry is growing, the need for new laws is only increasing the gap of appropriate laws alarmingly.¹⁷
- The treaties/agreements/conventions are not universally accepted and are binding only on those states that have ratified them. Even for those states that have ratified the treaties, there is no enforcement mechanism or penal actions for violators other than economic and trade sanctions and political pressure from the UN. Hence, the enforcement of the treaties/agreements/conventions is largely ineffective.
- Article IV of the treaty states that the Moon and other celestial bodies shall be used by all states parties to the treaty exclusively for "peaceful purposes". Though the establishment of military bases and testing of any type of weapon on celestial bodies is forbidden, the interpretation of the

16. Ibid.

17. Ibid.

The UN Charter confers the right of self-defence to a state against hostile action by another state to its space-based assets. This implies that nations can defend their space assets by defensive acts like the use of active and passive anti-ASAT and BMD systems. Tests of all kinds of ASAT and satellite defence systems are, thus, clearly not a violation of the OST.

term “peaceful purposes” could vary. There is no clarity on whether it should mean “exclusively non-military purposes” or “non-aggressive purposes”. Dual purpose space technologies and objects are non-aggressive but may serve military purposes. It would be near impossible to achieve an exclusive non-military behaviour of space objects.

- The OST, under Article IV, also prohibits states from placing nuclear weapons or any other Weapon of Mass Destruction (WMD) in the orbit of the Earth. However, the treaty does not prohibit the placement of conventional weapons in orbit. This gives a sort of legitimacy for the use of weapons in

space or through the medium of space.

- Article III of the OST states that parties to the treaty shall carry on activities in the exploration and use of outer space, including the Moon and other celestial bodies, in accordance with international law, including the Charter of the United Nations, in the interest of maintaining international peace and security and promoting international cooperation and understanding. However, Article 51 of the UN Charter also states, “*Nothing in the present Charter shall impair the inherent right of individual or collective self-defence if an armed attack occurs against a Member of the United Nations, until the Security Council has taken measures necessary to maintain international peace and security*”¹⁸. The UN Charter confers the right of self-defence to a state against hostile action by another state to its space-based assets. This implies that nations can defend their space assets by defensive acts like the use of active and passive anti-ASAT and BMD systems. Tests of all kinds of ASAT and satellite defence systems are, thus, clearly not a violation of the OST.

18. “Charter of the United Nations”, Repertory of Practice of UN Organs, at <http://legal.un.org/repertory/art51.shtml>. Accessed on April 16, 2018.

- Article XI of the OST states, “In order to promote international cooperation in the peaceful exploration and use of outer space, states parties to the treaty conducting activities in outer space, including the Moon and other celestial bodies, agree to inform the Secretary-General of the United Nations as well as the public and the international scientific community, to the greatest extent feasible and practicable, of the nature, conduct, locations and results of such activities. On receiving the said information, the Secretary-General of the United Nations should be prepared to disseminate it immediately and effectively”. Contrary to Article XI, it has historically been seen that the UN was not informed of any of the ASAT tests and neither was this information shared with the international community. It is, therefore, evident that the Article is neither practical nor feasible.

Many terms used in the space treaties like ‘outer space’, ‘weaponisation’, ‘exploration’, and ‘exploitation’, have not been clearly defined. This gives rise to ambiguity.
- Many terms used in the space treaties like ‘outer space’, ‘weaponisation’, ‘exploration’, and ‘exploitation’, have not been clearly defined. This gives rise to ambiguity.
- The Registration Convention, under its Article IV states that each state of the registry shall furnish to the secretary-general of the United Nations, as soon as practicable, the information concerning each space object carried on its registry. This information is to specify, besides other details, information on basic orbital parameters, nodal period, inclination, apogee, perigee and general function of the space object. The objective of this convention is to provide transparency and space situational awareness to foster space traffic management, confidence-building measures and for attribution of liability for damage. Though this is a necessity for ensuring controlled access to space, there are no means to ensure adherence to the registration guidelines or adherence to the registered specifications while launching the object. An example is the May 2014 Russian launch of three Kosmos communication satellites (Kosmos 2496, 2497, 2498). An

additional undeclared object was also launched, orbiting a few kilometres away from the declared payloads. It manoeuvred under its own power, eventually making a close approach to the rocket stage that launched it. The object was later identified and catalogued as Kosmos-2499 by the US.

- The Moon Agreement has not been ratified by the major space powers like the US, Russia and China as it seeks to prohibit extra-terrestrial property rights on the Moon and empowers equitable sharing of resources while allowing for mining of resources. With the trend towards commercialisation of space and private players showing interest in space exploration, the terms of the Moon Agreement may not be commercially viable. The US Space Policy Directive-I, issued in late 2017, prioritises exploration of the Moon and deep space in partnership with private players. This will generate much focus and activity on the exploration of the Moon and likely exploitation of rare Earth elements. The Moon Agreement is not robust enough to tackle the evolving situation and may result in military presence on the Moon to regulate the commercial activity.

INSTITUTIONAL FRAMEWORK FOR SPACE GOVERNANCE

The UN General Assembly, in order to consider and deliberate on the various international treaties and agreements, mandated constitution of the “Committee on Peaceful Uses of Outer Space” (COPUOS). COPUOS was set up by the General Assembly in 1959 to govern the exploration and use of space for the benefit of all humanity: for peace, security and development. The committee was tasked with reviewing international cooperation in peaceful uses of outer space, studying space-related activities that could be undertaken by the United Nations, encouraging space research programmes, and studying legal problems arising from the exploration of outer space. The committee was instrumental in the creation of the five treaties and five principles of outer space. International cooperation in space exploration and the use of space technology applications to meet global development goals are discussed in the committee every year. Owing to rapid advances in space technology, the space agenda is constantly evolving. The committee,

therefore, provides a unique platform at the global level to monitor and discuss these developments. The committee has two subsidiary bodies: the Scientific and Technical Subcommittee, and the Legal Subcommittee, both established in 1961. The committee reports to the Fourth Committee of the General Assembly, which adopts an annual resolution on international cooperation in the peaceful uses of outer space.¹⁹

The “Conference on Disarmament (CD)” was formed in 1979 as the single multilateral disarmament negotiation forum of the international community, after an agreement was reached among member states during the first special session of the UNGA, devoted to disarmament (1978). The CD is the multilateral disarmament negotiating forum of the international community. The CD and its predecessors have negotiated many multilateral arms control, non-proliferation, and disarmament agreements.²⁰

While the COPUOS focusses on the technical, legal and commercial aspects of peaceful uses of outer space, the CD addresses issues related to military uses of outer space and the challenges of an impending weaponisation of space. The prime initiative of the CD which aimed to address current gaps in the treaties relevant to space security is the “Prevention of an Arms Race in Outer Space” (PAROS) resolution which was adopted by the United Nations General Assembly’s First Committee on Disarmament and International Security. An adhoc committee on PAROS was formed in 1985 to examine and identify issues relevant to PAROS. This committee lasted until 1994. The PAROS resolution was to build on the efforts of the 1967 Outer Space Treaty to preserve space for peaceful uses. It has been a longstanding agenda item in the CD. PAROS lays stress on transparency and confidence-building measures, verification and creation of a legally binding instrument like the “Prevention of Placement of Weapons in Outer Space Treaty (PPWT)” which is currently under negotiation. Even though the US and Israel had repeatedly abstained from voting or voted against a PAROS resolution, the first draft treaty (PPWT) was put up by Russia and China as a joint document on

19. “Committee on the Peaceful Uses of Outer Space”, at <http://www.unoosa.org/oosa/en/ourwork/copuos/index.html>. Accessed on April 17, 2018.

20. “Conference on Disarmament (CD)”, at <http://www.nti.org/learn/treaties-and-regimes/conference-on-disarmament/>. Accessed on April 18, 2018.

The PPWT has not succeeded in receiving large-scale endorsement mainly because the draft treaty does not address direct-ascent ASAT systems; neither does it address soft kill or directed energy weapons like laser weapons or radio frequency interference that could be employed to permanently or temporarily disable a satellite.

February 12, 2008. The second draft was put up by Russia and China on June 10, 2014. The US rejected the second draft due to the lack of a verification regime and provisions that would prohibit the possession, testing, and stockpiling of weapons that could be placed in outer space.

The draft PPWT defines a weapon in outer space as *“any outer space object or component thereof which has been produced or converted to destroy, damage or disrupt the normal functioning of objects in outer space, on the Earth’s surface or in its atmosphere, or to eliminate human beings or components of*

*the biosphere which are important to human existence, or to inflict damage on them by using any principles of physics.”*²¹

Also, a device is considered to have been *“placed in outer space”* if *“it orbits the Earth at least once, or follows a section of such an orbit before leaving that orbit, or is permanently located in outer space or on any celestial bodies other than the Earth”*.²²

Ambiguity remains on definitions over where outer space begins, what type of weapons should be prohibited, or the means of verification. The PPWT has not succeeded in receiving large-scale endorsement mainly because the draft treaty does not address direct-ascent ASAT systems; neither does it address soft kill or directed energy weapons like laser weapons or radio frequency interference that could be employed to permanently or temporarily disable a satellite. ASAT systems (hard kill and soft kill) are inherently destabilising and yet do not find a mention in the PPWT.

21. “CD Documents Related to Prevention of an Arms Race in Outer Space”, CD1985, June 12, 2004, at [https://www.unog.ch/80256EE600585943/\(httpPages\)/D4C4FE00A7302FB2C12575E4002DED85?OpenDocuOpen](https://www.unog.ch/80256EE600585943/(httpPages)/D4C4FE00A7302FB2C12575E4002DED85?OpenDocuOpen), <https://documents-dds-ny.un.org/doc/UNDOC/GEN/G14/050/66/PDF/G1405066.pdf?OpenElement>. Accessed on April 19, 2018.

22. Ibid.

Also, the issue of space debris is not mentioned anywhere in the proposed draft treaty, even though the issue poses a far bigger challenge than the placement of weapons in outer space. The growth of the space debris population has already affected the safety and functioning of outer space assets. This issue is accentuated by the continued threat posed by the destructive capacity of hard kill, direct-ascent ASATs.

A large scale commercialisation of space activities has also resulted in the development of new and cutting edge technologies in every field of space to keep the competitive edge.

The existing governance mechanisms have not been able to keep pace with these rapid changes. Newer technologies have made existing regulatory mechanisms obsolete. Crowding of the lower Earth orbits due to satellite constellations for the space-based internet is an example. The delay in enacting regulations may also result in a safety hazard for space operations.

In 2006, the General Assembly adopted Resolution 61/75 that calls for concrete proposals for Transparency and Confidence-Building Measures in Outer Space Activities. As an answer to this resolution, the European Union (EU) initiated a process on an International Code of Conduct for Outer Space Activities.

The effectiveness of the UN in dealing with abrogation of UN mandated treaties and resolutions has waned in recent years due to the high-handedness of some advanced space-faring countries. The net result is a failure to protect global public interest.

EFFECTIVENESS OF ORGANISATIONS MANDATED BY THE UN IN REGULATING SPACE ACTIVITIES

The United Nations came to the fore in the early years of space ventures by the superpowers, with the formation of the adhoc committee on peaceful uses of outer space on December 13, 1958, and adoption of the first UN Resolution 1348 (XIII) entitled "Question of the Peaceful Use of Outer Space", leading to the formation of the permanent committee of UNCOPUOS on December 12, 1959. When US President John F Kennedy delivered a speech to the UN General Assembly during its 16th session on September 25, 1961,

he said, “*As we extend the rule of law on Earth, so must we also extend it to man’s new domain – outer space.*” Though treaties and international agreements on the use of outer space were executed in the following years, they were not applied equitably. The US was always in a position of advantage as it had already developed advanced space technologies which could be leveraged to achieve an offensive use of outer space or deny outer space to other developing space nations. Two distinct lobbies have emerged for negotiating a binding legal space treaty, with the US and its allies on one side, and Russia and China on the other, having submitted a joint document for a PPWT. It is rather intriguing that even after a decade of submission of the first draft for the PPWT, no progress is visible in acceptance of the treaty. Besides, there are parallel efforts by the European consortium to formulate an ‘International Code of Conduct’. This may be an alternative, but not a remedy to the problem of an impending weaponisation of space.

Formation of UN mandated committees is testimony to the fact that regulation of space activities is necessary. Moreover, the UN is the internationally accepted regulating and mediating body. However, UNGA resolutions being non-binding, contribute majorly to non-adherence and misinterpretation of resolutions and terms of agreements. As issues related to space have become more complex and geopolitics has played a major role in shaping foreign policies, UN resolutions have become ineffective in controlling national security ambitions. The absence of consensus on the Moon Treaty, with countries having active Moon missions not signatories to the agreement being a case in point. The effectiveness of the UN in dealing with abrogation of UN mandated treaties and resolutions has waned in recent years due to the high-handedness of some advanced space-faring countries. The net result is a failure to protect global public interest.

Following the tabling of the second draft of the PPWT in 2014, UNGA again adopted a resolution in 2015 on the “Prevention of an Arms Race in Outer Space” (UNGA Resolution 70/26) and “No First Placement of Weapons in Outer Space” (UNGA Resolution 70/27).²³ Resolution 70/26 was voted

23. UN General Assembly Resolution 70/26 and 70/27, at http://www.un.org/en/ga/search/view_doc.asp?symbol=A/70/PV.67. Accessed on April 24, 2018.

with 170 in favour, none against and 2 abstentions (the US and Israel). In contrast, Resolution 70/27 was voted with 129 in favour (including Russia, China and India) 4 against (including the US and Israel) and 46 abstentions. It is interesting to note that among these states, the US, Russia and China are the only space-faring nations with a capability to have a space weapons programme. This is ample evidence of the failure of the UN in evolving a consensus and formulating binding agreements in a multipolar world.

A summary of the limitations of existing major space regulating mechanisms is listed in Table 2 below:

Table 2

Space Regulatory Mechanism	Limitations
Five Core UN Space Treaties	<ul style="list-style-type: none"> - Very generic. - Scope for varied interpretation. - Undefined terminologies. - Products of the Cold War. - More space-faring countries today. Complex capabilities. Technology curve is well ahead of existing laws. - Limited enforcement mechanisms. - No means of verification - Moon Agreement has very low prescription and very low impact. - Did not cater for democratisation of space access and commercialisation of space industry. - Do not prevent weaponisation of space
UN Declaration of Legal Principles	<ul style="list-style-type: none"> - Generic in nature. - Cover limited space applications. - Guidelines, not binding. - Did not cater for democratisation of space access and commercialisation of space industry.
UN General Assembly Resolutions	<ul style="list-style-type: none"> - Resolutions are not legally binding. - Major space powers may abstain. - No means of enforcement.

<p>Negotiations under UNCOPUOS</p>	<ul style="list-style-type: none"> - Consensual decision-making, implies contentious issues remain unresolved. - Inability to resolve differences in opinion on utilisation of outer space and space weaponisation.
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THE MILITARISATION VS WEAPONISATION DEBATE

Space is becoming increasingly vital in the conduct of modern warfare as a force enabler and force enhancer. The use of satellites and space-based applications in the conduct of military affairs has only been increasing ever since this was demonstrated in the Gulf War of 1991 (Operation Desert Storm). Though the use of space has its genesis in the rivalry between the superpowers in the Cold War years, and was intended to ensure a military edge through reconnaissance of nuclear launch sites and communications, the military utility has extended to many other fields like Positioning, Navigation and Timing (PNT) through Global Positioning System (GPS) satellites, weather prediction through weather satellites and use of broadband datalinks through communication satellites for network-centric real-time operations. Military utility of space is, thus, an internationally accepted reality, not barred by existing legal obligations; and militarisation of space is, thus, a beginning but not the end.

While the Outer Space Treaty (OST) of 1967 establishes that space is free for exploration and use by all states, except for the placement of nuclear weapons in space, it implies use of space for peaceful purposes, and utilisation of space as an enabler of military functions does not violate any terms of the treaty. However, the OST is silent on the aspect of placing weapons in space or using weapons from, or through, space. The prospect of using space aggressively was initiated in 1959, with the US testing the world's first ASAT intercept with an air-launched missile, and later in the 1960s, with the Soviet orbital bombardment systems designed to target US nuclear sites. Though there were short periods of pause in ASAT testing due to the Anti-Ballistic Missile (ABM) limitation Treaty of 1972, a brief period of moratorium on testing since 1986 due to the debris issue and post the break-up of the Soviet Union, recent developments suggest a revival and resurgence

of ASAT development specifically in Directed Energy Weapons (DEWs). The emergence of China as a dominant space power, and other countries like the UK, France, Japan, Brazil, India, Israel, Iran and the Koreas as independent space-faring nations is a major contributing factor for the resurgence of the pro-space weaponisation lobby.

Though there is no clearly defined position under the existing legal space regimes on what could be construed as weaponisation of space, a common understanding would include the following acts:

- Placement / orbiting of weapons in outer space.
- Attacking terrestrial objects from weapons based in space.
- Attacking space objects of another state from the Earth or from space.
- Weapons transiting through space (like ballistic missiles or BMD).

We all agree that space is currently militarised, but not weaponised. However, the defining line between the two is fading. The dual use conundrum has blurred the lines in a way that allows states to pursue covert agendas on utilisation of space for national security. Directed Energy Weapons (DEWs) like laser systems which have been used as terrestrial-to-space targeting systems are ASAT systems, but their classification as space-weapons is debatable. The commonly used military applications of space assets, e.g. communications, imagery and navigation are all roles towards enhancement of military capabilities, but have now transitioned from enhancement to being enablers of military power. The recent space activities suggest the beginning of a new era where space is becoming the medium itself for war-fighting and space denial and offensive space force projection is a possibility in the near future.

The commonly used military applications of space assets, e.g. communications, imagery and navigation are all roles towards enhancement of military capabilities, but have now transitioned from enhancement to being enablers of military power. The recent space activities suggest the beginning of a new era where space is becoming the medium itself for war-fighting and space denial and offensive space force projection is a possibility in the near future.

Space commerce and industry have now driven the quest for military superiority into space, such that space weaponisation will now be a fallout of the desire to protect a rapidly expanding space economy.

IS SPACE WEAPONISATION INEVITABLE?

While mutual mistrust amongst the superpowers and Cold War rivalry was the genesis of the first space race, what we see today is a space race for different reasons. Space technology, national space exploration policies, socio-economic dependence on space and commercial interests seem to have pushed the terrestrial limits of military superiority. Space commerce and industry have now driven the quest for military superiority into space, such

that space weaponisation will now be a fallout of the desire to protect a rapidly expanding space economy. As space technologies develop further to sustain the quest for space exploitation and burgeoning space commerce, space weapons will find their way into national space policies and doctrines, especially in the absence of clearly defined laws prohibiting space weapons. The pursuit of national interests will compel a space race 2.0, including space dominance through offensive and defensive space capabilities.

Freedom of operation in space has been recognised as the prerequisite for sustaining a space economy as well as for providing unrestricted support to military functions. While space is the dominant medium capable of affecting conventional warfare decisively, emerging ASAT capabilities of opposing space-faring nations could undermine this critical aspect. Space control is, thus, being pursued by the space superpowers as a means of ensuring freedom of operation in space.

Leading space-faring countries like the US, China and Russia are now visibly pursuing active and passive space control technologies. Efforts towards space-based BMD and DEWs are drivers of space weaponisation. The US National Security Strategy clearly prioritises defence of its space assets and freedom of operation in space. Space capabilities also figure as a strategic domain where the US seeks to renew capabilities and a competitive advantage. This is a significant shift from the US national space policy of 2010, which talks about strengthening stability in space by promoting its peaceful use. The US

National Defence Strategy of 2018 in contrast has put countering China and Russia at the core of America's new priorities, listing China and Russia as paramount security threats to the US. These developments are indicators of a greater power competition, shifting the focus from terrorism. China's space adventurism in the past decade, and its growing space clout which is visible in its reaching the third slot in the world space order is an indicator of the reason for China being designated as a strategic competitor by the US. It is not surprising that China and Russia, along with the US, are the only countries to have tested ASATs and are actively pursuing ASAT technologies. Other space-faring countries like Iran and North Korea may not be far behind.

Orbital debris and lack of credible debris mitigation techniques is probably the single most prevailing reason for preventing space weaponisation. The single largest source of debris has been through intentional satellite explosions through ASATs and accidental collisions in space.

As a counter-view, space has enabled global visibility in terms of communications and intelligence gathering. This has given the possibility of everyone watching everyone. The transparency can be said to be nurturing global stability. Weaponisation of space creates global instability, there being no limits to the extent of space weaponisation and no means of assessment either. This is bound to give rise to space posturing and is likely to result in escalation and preemption. Also, the lucrative prospect of orchestrating wars through and in space may make conventional militaries ineffective, or worse still, push them back to the archaic role of occupying forces.

Orbital debris and lack of credible debris mitigation techniques is probably the single most prevailing reason for preventing space weaponisation. The single largest source of debris has been through intentional satellite explosions through ASATs and accidental collisions in space. There is a growing concern in the international space community due to the increasing number of operational space systems and a limited space situational awareness capability which may result in accidental collisions and chain reactions of exponentially increasing orbital debris. A space regulation prohibiting launch of space objects without

reliable debris mitigation procedures is an option which could prevent further escalation of debris.

The real problem lies in the absence of any UN mandated treaty which clearly defines unacceptable weaponisation of space and institutes clauses for prevention and verification. The biggest roadblock to any stringent international treaty bringing more transparency and weapons control to outer space is the US. The US would not want a space weapons control treaty as it would limit its National Missile Defence (NMD) architecture and undermine its hegemony in space control technologies. Nations with existing space weaponisation programmes need to first take the lead in decommissioning existing offensive space Research and Development (R&D) through mutual consent, which is a distant possibility. Expansion of the OST to prohibit offensive use of space and strengthening existing legislations through an internationally acceptable treaty is being deliberated upon since 2008. However, unless the top three space-faring nations take a step back, weaponisation of space may be a reality.

Are space weapons inevitable? Human nature, national ambitions and geopolitics seem to push us towards them. Every medium – land, sea and air – has seen conflict. There is no reason why space should be any different. The quest for military supremacy in all the dimensions of warfare, unrestricted access to space-based assets, the desire to pioneer space exploitation and a viable deterrence value created through space are all pointers towards an impending weaponisation of space.²⁴

CAN SPACE WEAPONS WIN WARS?

This is probably the only reason why a nation should even think of possessing space weapons. As mentioned earlier, space weapons (non-nuclear) could be of many types, depending on where the intended target is located, i.e. on the ground, in space or in between. Also, these weapons could be terrestrially located or in space. Weapons in space for targeting space objects or terrestrial targets are still a fictional concept. Though the Soviet Orbital Bombardment

24. T H Anand Rao, "Is Space Weaponisation Inevitable?", CAPS Expertview, February 5, 2018, at <http://capsindia.org/expertview>. Accessed on April 30, 2018.

Systems of the 1960s were intended to destroy targets on the Earth, these are yet to evolve and have not been tested. Present capabilities possessed by the US, Russia and China are limited to ASATs launched from the Earth, DEWs and co-orbital or parasite ASAT platforms. The cost of developing such weapons and maintaining them in a reliable state is also exorbitantly high.

Space systems are mostly dependent on satellites for various applications. This has already been brought out earlier. These include the military functions. With today's military functioning becoming gradually reliant on information dominance which is enabled by the networked Command, Control, Communications, Computers, Intelligence, Surveillance, Reconnaissance (C4ISR) architecture, a disruption of satellite services could, at best, delay, disrupt or temporarily deny a service like rece reports, navigation and positioning service or data transfer. These disruptions or denial of services would be temporary as redundancy exists through terrestrial systems or other satellites of a constellation. Thus, if a satellite is destroyed or disabled as a consequence of military conflict, it could, at best, be compared to losing an aircraft or a tank in battle. The capability to launch satellites on demand, orbit large constellations of small satellites for various military and civilian applications, and have backup systems on the ground would ensure that the occasional ASAT could be ignored or responded to.

Present military space capabilities are limited to enhancing and enabling the performance of a military on the ground. In no way, would the loss of some space assets be decisive in any conflict, even though it is considered a Centre of Gravity (CoG). But it could definitely influence the outcome of the war depending on the degree of dependence on space assets for war-fighting. Weapons having effects on a larger scale like nuclear detonations in space could change the scenario.

THE DUAL USE DILEMMA

It is a known fact that space technology is a dual use technology. Many military missions and objects in space can be concealed as activities towards scientific research and for peaceful uses. For instance, the US X-37B space plane which is an unmanned autonomous space vehicle, has done five long duration

In the international space community, it is generally agreed that the laws applicable to armed conflict extend to activities in outer space. Therefore, attacking an opponent nation's known military assets in space would not pose a major issue during a conflict.

missions in space and is suspected to have capabilities in counter-space activities, though it is launched for space exploration missions. Similarly, other space objects like satellites are launched for civilian applications like remote sensing or specific military applications like reconnaissance. There being no pre-launch verification of payloads in the existing space governance mechanism, means that the task performed by the satellite or space object cannot be ascertained, which could then possibly be a co-orbital ASAT or a satellite with potential to

become an explosive or an EMP generating object. The possibilities are diverse and none can be ruled out. This makes the space domain a potentially unstable environment which could be used to advantage by space capable nations to gain advantage in an armed conflict.

While the 'UN Charter' upholds the right to self-defence if a nation's sovereignty is undermined – and this extends to security of objects in space – there is a lack of clarity on the applicability of the "Laws of Armed Conflict". Attacks on legitimate military objectives versus civilian objects are well regulated in the context of armed conflict (Additional Protocol I, Article 52). In the international space community, it is generally agreed that the laws applicable to armed conflict extend to activities in outer space. Therefore, attacking an opponent nation's known military assets in space would not pose a major issue during a conflict. However, if the space object or objectives of space activities are clearly defined as being for civilian use despite being dual use technologies, then an attack on such objects could be a violation of the laws of armed conflict. Also, the impact of destroying or disabling a satellite used for critical functions like positioning (GPS) or communication (banking systems) could be disastrous.

EMERGING CONCERNS

- **Vulnerability of Space Assets:** A satellite has an average life of 10-15 years depending on the orbit type, size and fuel capacity. This means,

many satellites have been in orbit for more than 10 years or were launched before the ASAT race kicked in following the 2007 test by China. Satellites of this vintage may not have the basic protection like hardening and shielding against ASAT weapons like directed energy weapons or against minute debris particles (< 1cm). In the current trend of commercialisation of space applications and miniaturisation of satellites, the satellite vulnerabilities are not addressed by private satellite launchers to achieve reduction in capital costs. Also, private satellite companies like 'one web' are planning to launch constellations of large numbers of small satellites in Low Earth Orbit (LEO) for cost-effective solutions in communication and satellite-based internet services. These satellites would be easy targets in LEO for any ASAT misadventure by a hostile state, and will also be prone to disruption of services caused by electronic interference or electromagnetic pulse events.

The intentional or unintentional targeting of space assets would cause temporary or permanent disruption of satellite services, some of which could be critical for a state's well-being or economy, e.g. banking and communication applications. There would always be a chance of escalation of tensions depending on the underlying fault lines in bilateral relations.

- **Fear of Escalation:** The intentional or unintentional targeting of space assets would cause temporary or permanent disruption of satellite services, some of which could be critical for a state's well-being or economy, e.g. banking and communication applications. There would always be a chance of escalation of tensions depending on the underlying fault lines in bilateral relations. Escalation into a military conflict will always be a chance occurrence if diplomatic measures to resolve the conflict fail.
- **Uncontrolled Debris:** Outer space today is congested not only due to the increasing numbers of satellites but also due to space debris. Around 19,157 objects larger than 10 cm are being tracked by the US Space Surveillance Network. Only about 1,800 of these objects are operational

spacecraft or satellites; the rest comprise orbital debris. The estimated population of particles between 1 to 10 cm in diameter is approximately 5,00,000. The number of particles smaller than 1 cm probably exceeds a million and can only be speculated. Most orbital debris is within 2,000 km of the Earth's surface. Within this volume, the amount of debris varies significantly with altitude. The greatest concentrations of debris are found near 800-850 km.²⁵ Three unnerving facts merit consideration here: (a) only debris more than 10 cm in size can be tracked reliably with the present capabilities, and particles > 5cm can be located; (b) debris will remain in outer space forever, unless technologies to remove them are fully developed; (c) any destructive event in space like an explosion due to a collision, impact or ASAT activity is going to create more debris.

The debris created by a single destructive event will increase exponentially with a cascading effect (as described by 'Kessler's Syndrome') and would permanently degrade the space environment. It may be recalled that the Chinese ASAT test of 2007 created 3,000 pieces of trackable debris. Weaponisation of space would make the debris problem much worse, and even one war in space could engulf the entire planet in a debris cloud, making outer space practically unusable for any space applications.

- **Proliferation of Soft Kill ASAT Weapons:** The evolution of ASAT weapons started with hard kill ASAT weapons like kinetic kill vehicles, which could be mounted on a ballistic missile platform. The convenience of converting an already available platform (for states that possessed ballistic missile and BMD technology) meant that any space-faring nation with launch capability could develop an ASAT programme. Access to missile and space technology by many developing countries like Iran and North Korea has increased the possibility of ASAT proliferation. However, these hard kill ASATs invite international condemnation and sanctions which need to be avoided. Moreover, the past decade has seen an awakening regarding space debris avoidance and mitigation. This change was triggered by the Chinese ASAT test of 2007. The emerging situation has

25. "Space Debris", at <https://nasasearch.nasa.gov/search?query=debris&affiliate=nasa&utf8=%E2%9C%93>. Accessed on April 30, 2018.

resulted in the development of soft kill ASAT technologies like Directed Energy Weapons (DEWs), Electromagnetic Pulse (EMP) weapons, Radio Frequency Interference (RFI) and cyber attacks on space infrastructure. The effects could be temporary or permanent disability. While the cost of developing soft kill weapons is much lower, the source of soft kill attacks is difficult to trace and the cause of malfunction or damage may also not be pinpointed by the victim state. Owing to these reasons, a global shift towards soft kill weapons has been seen in recent years. The US, China and Russia are known to possess proven capabilities in laser weapons and RFI. While the advantages of developing soft kill weapons are understandable, the emerging situation of space weaponisation is that of uncertainty. Soft kill weapons would not fall under the ambit of the classical definition of space weapons, while still retaining the effect that would be caused by space weapons. This would create an imbalance in global and regional stability as there is always fear of the unknown in any geopolitically tense situation. Whether such soft kill weapons would lead to an escalation to military response or not is a matter of debate, as it would mainly depend on identification of the hostile action.

- **Impediment to Growth of Space Economy:** The space economy in terms of growth rate has shown a higher growth as compared to the Gross Domestic Product (GDP) growth rate of major economies. This was possible because of a surge in innovative satellite applications, growth in the satellite manufacturing and space launch segment, and emergence of the small satellite market. Above all, it is the commercialisation of the space industry which drives the space economy. All this was possible in the belief that space was a sanctuary and treated as a 'global commons'. With the change of the status quo in outer space and a shift from the 'sanctuary' to the 'control' school of thought amongst the leading space-faring nations, space commerce would definitely be a casualty in such an atmosphere of uncertainty.
- **Mistaken Military Response**
Many events in space are unpredictable. These could be natural like cosmic events or situations arising out of technical glitches or unintentional collisions. Flashes by meteors or cosmic explosions

Unintentional explosions, uncontrolled behaviour, and unintentional collisions of man-made space objects have the potential to create hostile situations, if the event is perceived as a deliberate act of war. Such a situation is aggravated in a pre-condition of geopolitical instability and an existing hostile environment.

could be mistaken for a missile attack though such a possibility is extremely rare. Unintentional explosions, uncontrolled behaviour, and unintentional collisions of man-made space objects have the potential to create hostile situations, if the event is perceived as a deliberate act of war. Such a situation is aggravated in a pre-condition of geopolitical instability and an existing hostile environment. Prevention of a mistaken military response is only possible through the creation of well-defined laws and regulations, and sharing of information and transparency in space activity.

TRIGGER EVENTS

The realisation among space-faring nations to be capable of identifying threats from space and possess space capabilities that can withstand aggressive counter-space programmes is the start point to developing counter-space capabilities. The capabilities envisaged would differ depending on the threat scenario. The US perceives Russia, China and North Korea as a threat to global peace. The converse is also true. But when it comes to space capabilities the asymmetry narrows down to irrelevance mainly owing to the fact that DEWs like laser weapons can cause disruptions in satellite services. The result is an upward spiral in development of offensive and defensive space capabilities by these countries. There have been some trigger events in the space domain which have raised the bar of mistrust after the Cold War era and collapse of the Soviet Union:

- Chinese ASAT test in 2007.
- US ASAT test in 2008.
- US refusal to accept terms of draft PPWT put up by China and Russia in 2008 and 2014.

- US and Israel abstaining from a vote on UNGA Resolution 70/26 and voting against Resolution 70/27, in 2015.
 - Active development and testing of satellite rendezvous technology for undertaking repairs and /or debris removal technologies by the US, Russia and China. These being dual use technologies, they could possibly also have counter-space capabilities.
 - Active development and testing of DEWs like laser weapons by the US, Russia and China.
 - Development of electronic interference capability against satellite links.
 - Long duration missions of the X-37B spaceplane with an undisclosed mission profile.
 - Global trend towards large constellations of small satellites, and swarm satellites, raising fears of violating a nation's sovereignty, intensifying the problem of space traffic management, and making covert missions more difficult to detect.
- It is reasonable to assume that individual space ambitions can be fulfilled by sharing of the resources. A shift towards sharing of space resources and collaborative efforts will have the advantage of lowering the threat value of a space asset. Targeting of each other's space assets in a situation of military conflict will then become a remote possibility.**

COLLABORATION: AN ANTIDOTE FOR WEAPONISATION OF SPACE?

Space projects like the Apollo Moon missions which were undertaken by the US entirely on its own, demand highly competitive and skilled effort and budgetary allocations, all of which are a drain on the economy. In today's scenario, the high costs of space activity and rapidly progressing space technology, i.e. reusable launch vehicles, ion propulsion, optical communication, etc. may require the coordinated effort of many nations. Cooperation, alliances, partnerships and an inclusive approach are finding more relevance in the present global space scenario for various reasons. International cooperation in many technologies, and specifically those which have a major bearing on social well-being, is more of a necessity, even for the developed nations. Such cooperative approaches are

already being seen with the International Space Station (ISS) becoming truly an international effort. Inclusion of China also in the ISS programme would be a boon for China as well as the ISS programme, and, at the same time, assist in building trust and understanding of each other's capabilities. The European Space Agency (ESA) is a shining example of a conglomerate of space capable nations jointly working towards passing on the benefits of space to their citizens and conducting some pioneering work on space exploration, even though they have the capability and capacity to jointly develop counter-space technologies. The South Asia satellite or South Asian Association for Regional Cooperation (SAARC) satellite launched by the Indian Space Research Organisation (ISRO) in 2017, for meeting the communication needs of the South Asian countries is another example of regional cooperation in space ventures. With spectrum and orbital crowding emerging as a critical concern, especially in Low Earth Orbit (LEO) and Geosynchronous Earth Orbit (GEO), it is evident that not every entity in space can get a slot of choice. It is reasonable to assume that individual space ambitions can be fulfilled by sharing of the resources. A shift towards sharing of space resources and collaborative efforts will have the advantage of lowering the threat value of a space asset. Targeting of each other's space assets in a situation of military conflict will then become a remote possibility as it would affect many nations. Such multilateral collaborations with more participating countries will also foster preserving space as a sanctuary for peaceful uses only. The trend towards offensive actions in space would then see a reversal.

NEED FOR A PROACTIVE APPROACH

While advances in space technologies over the past few decades have given a new dimension to accelerated living and space commerce, outer space has not only become a new dimension of warfare but also a critical domain for information dominance and an inseparable part of the national security calculus. The C4ISR environment created by the "Revolution in Military Affairs (RMA)", based on network-centric operations and an integration of Information and Communication Technologies (ICT) is increasingly dependent on space capabilities. This fact has been recognised by many

countries and has resulted in a realisation of the essence of offensive and defensive space control for having freedom of operation in space. This opportunity to create asymmetry through the domain of space, along with ease of access to some countries, has had an impact on the international balance of power equation, which has emerged as a new dimension in global stability.

The OST of 1967 did prohibit placing of weapons of mass destruction in orbit, which was the need of the times. It was not foreseen that weaponisation of space through conventional and soft kill weapons would some day become a reality. This loophole in the OST is being viewed as a right to develop and possess weapons which could have an effect in outer space. The emergence of new space powers like China, India, Japan and North Korea and the relative ease with which ASATs can now be developed on an anti-ballistic missile framework are pointers to outer space becoming contested. In future, more nations would aspire to possess space weapons to achieve space security. The deterrence value of offensive space capabilities can lure many countries to developing space weapons. In turn, the advanced space-faring nations would push the bar a little further by upgrading the technology and having export controls to retain their supremacy. This would trigger an inherent space race to gain control of space, and is a vicious cycle. This impending gridlock needs to be prevented, with immediate steps to reassure the international community that outer space cannot become a battleground. Some of the steps that need to be initiated on a war-footing are:

- Urgently revamp the treaties, agreements and laws concerning space governance with binding international laws.
- Define the terms 'space weapons', 'peaceful use of outer space', 'offensive use of outer space'.
- Spell out the threshold of military uses of space.
- Immediately effect a ban on testing of destructive space technology like ASATs, DEWs and EMP weapons. Since these could be veiled in dual use technologies, a ban could be based on 'intent' and 'profile' of testing, rather than a ban on technology proving.

- Lay down a limiting altitude for BMD weapons, say, 200 km, to prevent interception explosions in LEO, which would create space debris. The interception altitude should cater for orbital decay and burnout of debris created due to explosion.
- Lay down an internationally accepted code of conduct for utilisation of space.
- Form an unbiased agency under the UN, with representation from all space-faring nations, with a well defined mandate, like that given to the International Atomic Energy Agency (IAEA), to inspect all space facilities across the world, and make recommendations to be implemented by the UN.
- Promote transparency in space operations and sharing of information.
- All space missions should be conducted through international cooperation with no single stakeholder.
- All Space Situational Awareness (SSA) inputs from across the world should be fed into a single global network and administered jointly through international cooperation.
- Benefits accruing through space missions can be made accessible to all nations.
- Pioneering nations can get compensated through other mechanisms, like priority allotment of orbital slots, waiver of loans from the World Bank, access to free trade, airports and sea ports, easing of immigration rules, etc.

For all this to take a positive turn, a great deal of visibility in space activities is essential. Launch of unregistered space objects covertly or on a rideshare arrangement has been witnessed in the past. Such events can be avoided only if the space situational awareness network is made an internationally monitored network. Presently, it is a network with a US monopoly, as a majority of sensors belong to the US. For such globalisation, the SSA capabilities must be distributed across the world with technology sharing agreements and international funding of projects.

MASS ATTACK BY DRONES: FACING THE CHALLENGE

ASHEESH SHRIVASTAVA

THE SMALL AND SILENT AERIAL DRONE ATTACK

On January 6, 2018, the world woke up to a new manifestation of a threat from non-state players: the use of home-made drones to attack conventional military targets. On the intervening night of January 5-6, 2018, the Russian military air base at Humaymin (Khmeimim) and its naval base at Tartus in northwest Syria were synchronously attacked by a cluster of 13 Unmanned Aerial Vehicles (UAVs). The scale of the attack was unprecedented. Ten small UAVs with underslung Improvised Explosive Devices (IEDs) targeted the air base while another three flew towards the naval base. Russian reports claim that seven of them were destroyed by the Pantsyr-1S short range air defence system and the remaining six were intercepted by Electronic Warfare (EW)¹ units. However, three of them exploded on impact with the ground and only three UAVs could be recovered for forensics.

The US Federal Aviation Administration (FAA) defines 'drones' as an Unmanned Aircraft System (UAS), which is an aircraft without a human pilot onboard, and is controlled by an operator on the ground. This article discusses the emerging threat of the use of micro and nano² UAS, or small drones, as a potential weapon by militaries as well as by terrorist groups to strike high value targets. This paper also analyses the investments by agencies in developing smart drones as a formidable weapon system, and

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1. Electronic Warfare (EW) is a generic term that represents the military use of the electromagnetic spectrum – including radio, infrared or radar signals—to sense, protect, and communicate. At the same time, it is also used to deny or disrupt adversaries the ability to use these signals.
2. Nano Drones: MTOW < 250 gm and Micro Drones: MTOW < 2 kg.

also the methods to counter this threat. In this respect, India's preparedness quotient, to counter threats evolving from this new concept of conflict; i.e. drone attack, is analysed in this paper.

Fig 1: Inverted Photo of UAV, with Underslung Bombs, Captured by the Russian Troops



Source: Ministry of Defence of the Russian Federation, Facebook page.

THE SYRIAN CHRONICLE

Details made public by the Russian military commanders³ stated that the aerial vehicles used in the January 5, 2006 attack were guided and controlled by a rudimentary Global Positioning System (GPS) sensor and Global System of Mobile Communication (GSM)⁴ enabled remote control module. The drones were powered by small piston engines with sufficient fuel to enable 1-2 hours of flight. Therefore, it was inferred that their launching site and control stations could have been more than 50-100 km away. The UAVs also carried explosive devices fitted with advanced impact fuses. However, the construction of the vehicles (refer Fig 1) did not display any sophistication

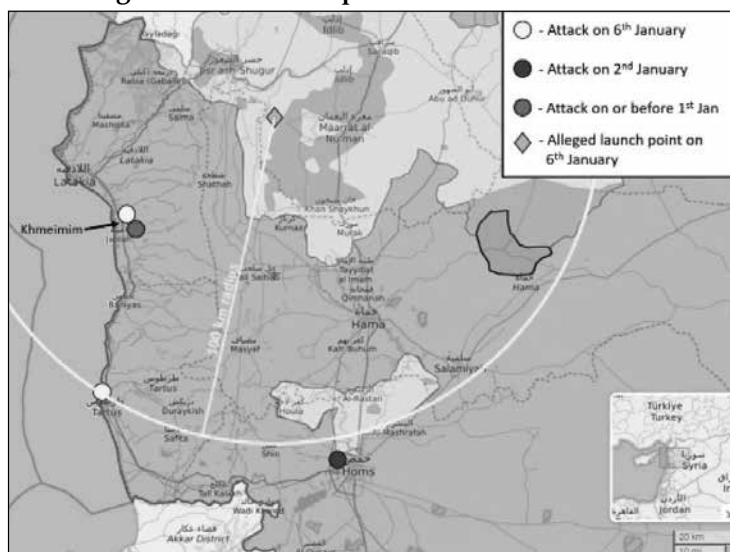
3. Jeremy Binnie, "Russians Reveal Details of UAV Swarm Attacks on Syrian Bases", *HIS Jane's Defence Weekly*, January 12, 2018, <http://www.janes.com/article/77013/russians-reveal-details-of-uav-swarm-attacks-on-syrian-bases>. Accessed on March 2, 2018.

4. GSM or Global System for Mobile communication is a global standard developed for use by cellular mobile devices. The technology also enables extending internet connectivity to mobile devices. Plug-in internet dongles with GSM SIM card can be used to control drones via the internet using a PC or smart phone over a long distance.

in technological acumen, leading investigators to conclude that these may have been assembled in a backyard without any aviation expert support. The small Internal Combustion (IC) engine and the control system used on these platforms are also available 'commercially-off-the-shelf' and, thus, are easily procurable by any aeromodelling enthusiasts. The wings of the aircraft were made from polystyrene and reinforced with balsa wood slats. Each wing had an underslung rack with a releasable mechanism to drop bombs. Four bombs weighing 50 gm each, containing Pentaerythritol Tetranitrate (PETN) explosive with impact fuses were strapped under each wing. Each UAV, carrying 400 gm of explosives was intended to cause noticeable losses to military Vital Areas/ Vital Points (VAs/VPs), with low investments.

There is an emerging threat of the use of micro and nano UAS, or small drones, as a potential weapon by militaries as well as by terrorist groups to strike high value targets.

Fig 2: Schematic Map of Area of Drone attack



Source: Nick Waters and <https://syria.liveuamap.com/>

The Russian military was luckily able to fend off the attack because the improvised drones were not very sophisticated and reckonable ground

intelligence⁵ about a UAV attack was available to them. On two previous occasions i.e. January 2, 2018 and January 3, 2018, similar looking drones were recovered by locals after they crashed near the Military Engineering Academy, Homs and Khmeimim air base. According to reports,⁶ the drones were probably assembled and launched from a small hamlet, Muwazarra, located northeast of Humaymin air base. Muwazarra had been designated as a ‘deescalation zone’ under the existing agreement among Russia, Turkey and Iran (a schematic map⁷ of the area showing previous attacks is placed as Fig 2). Reports in the media and events before the D-day suggest that ground intelligence of the potential threat and likely methodology may have been known to the Russians. However, it cannot be ruled out that in another scenario, a better coordinated, intelligent formation of drones with more nimble and networked command and control gadgets could have left the Russian forces much embarrassed.

Fig 3: Pantsir-S1 Anti-Drone System



To fight off the ‘mass attack by drones’ launched by the *ihadists* against their bases in Syria, the Russians used the Pantsir-S1 (refer Fig 3) mobile surface-to-air missile/ anti-aircraft artillery system. The system, also called

5. Nick Waters, “The Poor Man’s Air Force? Rebel Drones Attack Russia’s Airbase in Syria”, https://www.bellingcat.com/news/mena/2018/01/12/the_poor_mans_airforce/, January 12, 2018. Accessed on January 29, 2018.
6. David Reid, “A Swarm of Armed Drones Attacked a Russian Military Base in Syria”, *CNBC News Network*, January 11, 2018, <https://www.cnbc.com/2018/01/11/swarm-of-armed-diy-drones-attacks-russian-military-base-in-syria.html>. Accessed on January 21, 2018
7. Waters, n.5; and Map of Syria, <https://syria.liveuamap.com/>

'Gvozd' (Russian for 'nail') is capable of firing 5,000 rounds per minute of 30mm ammunition or concurrently launching anti-aircraft missiles from its 12 launch canisters. The system has an effective standoff range of 10-15 km and has proved very effective against low flying objects or armed UAVs. As stated earlier, seven of the 13 drones were shot down by this weapon system.⁸ The remaining six drones were hacked using the Krasukha-4 Electro-Magnetic Pulse (EMP) shield weapon. The EMP weapon made the drones crash or force land outside the target area. Three of these drones were recovered by the military authorities and were exhibited during the press briefing.

THE NEW AERIAL ARSENALS

This mass drone attack on the well-fortified Russian garrison at Syria highlighted the factual danger that small UAVs pose to strategic assets or public facilities/ infrastructures across the globe. Defence experts have long been advocating that use of small armed drones could soon become a common feature in an urban battlefield. These low cost, easily produced, low technology weapon delivery platforms comprise a dangerous manifestation of capabilities by both small anti-establishment groups as well as large nations. These devices/ platforms can be equally employed by sophisticated nations, low-tech rebel groups, or non-state militaries. The January 6, 2018 terrorist attack showed that the threat from synchronously flown UAVs is real and unchecked proliferation of this idea could cause widespread losses at military establishments and civilian infrastructure alike.

The use of unmanned aircraft in military campaigns is not a new concept. The possibility of using remotely controlled weaponised aerial platforms in active combat was first discussed by Lee De Forest and UA Sanabria in 1940⁹ in the *Popular Mechanics* magazine. Between the two World Wars, many militaries experimented with different strategies and approaches for

8. Raf Sanchez, "Russia Uses Missiles and Cyber Warfare to Fight Off Swarm of Drones Attacking Military Bases in Syria," *The Telegraph*, January 28, 2018, <https://www.telegraph.co.uk/news/2018/01/09/russia-fought-swarm-drones-attacking-military-bases-syria/>. Accessed on February 4, 2018.

9. "Robot Television Bomber", *Popular Mechanics*, December, 1940, https://books.google.co.in/books?id=19kDAAAAMBAJ&pg=PA805&redir_esc=y#v=onepage&q&f=false. Accessed on March 12, 2018.

From a tactical approach, the Gulf War of 1991 is called the first war with UAVs. Large fixed-wing aerial platforms with longer endurance than manned aircraft, and armed with appreciable surveillance capabilities continuously dotted the skyline during the entire period of conflict.

drones. The 1973 Yom Kippur War¹⁰ saw Israel use drones effectively for real-time surveillance, reconnaissance, electronic warfare and also as decoys. From a tactical approach, the Gulf War of 1991 is called the first war with UAVs. Large fixed-wing aerial platforms with longer endurance than manned aircraft, and armed with appreciable surveillance capabilities continuously dotted the skyline during the entire period of conflict.

Fig 4: Chinese Swarm Drones



From the earlier days of fixed-wing single-engine UAVs, technology has not only miniaturised the platform but also made it autonomous and optimally packed with sophisticated sensors and armament. The era of nano-drones and micro-drones with ‘autonomous’ capabilities has begun, with drones ranging from lab-scale prototypes to mass scale production models.

10. The first UAV squadron on the Israeli Air Force was established on August 1, 1971, at Palmahim air base. It was then equipped with the US manufactured Northrop ‘Chukar’ UAVs. On October 7, 1973, the Chukars flew towards the Golan Heights, making the Syrian AD radars believe that a massive combat air strike had begun. The Syrians activated their anti-aircraft missile systems, thus, exposing them for attack by the Israeli fighter which were following the UAV at a safe distance. <http://www.iaf.org.il/4968-33518-en/IAF.aspx>. Accessed on March 4, 2018.

These autonomous drones are designed and developed with a certain degree of decision-making capabilities like adaptive formation flying, obstruction avoidance, target acquisition, etc. This new concept of using a flock, usually more than 100 small UAVs, arming them with Artificial Intelligence (AI) and remotely instructing them to carry out a mission is popularly labelled as the “swarm drone”. While large UAVs have distinct advantages in the conventional battlefield, nano (and micro) drones have demonstrated a different set of capabilities best suited for urban/ low intensity conflicts. Open-source literature suggests that many countries, across the globe have invested in technologies to develop drones for military as well as civilian purposes. According to media reports, some nations that have demonstrated reckonable capabilities in developing drones include the US, China, Russia, Israel, Iran, India, Pakistan, UK, Turkey, France, North Korea, etc.

Amongst the large military powers, China has invested in technologies to develop low cost drones with AI.¹¹ The Chinese State National University of Defence Technology (NUDT)¹² has been conducting experiments involving over two dozen small UAVs (refer Fig 4). These fixed-wing small aircraft are capable of flocking together autonomously after launch, carrying out surveillance and reconnaissance of a designated area and even destroying selected targets which match the pre-programmed profile, characteristics or radiation signature. According to Professor Shen Lin Cheng, chairman of NUDT’s Institute of Artificial Intelligence Science, “We have precise short, medium and long-term objectives, which are consistent with those set by the government on the modernisation of the Chinese armed forces by 2020, 2035 and 2050”. In June 2017, the state-owned China Electronic Technology Group Corporation (CETC) conducted an experiment to demonstrate synchronised flying of 120 unmanned fixed-wing drones.

11. Joseph Trevithick, “China is Hard at Work Developing Swarms of Small Drones with Big Military Application”, *The Drive*, January 16, 2018, <http://www.thedrive.com/the-war-zone/17698/chinas-is-hard-at-work-developing-swarms-of-small-drones-on-multiple-levels>. Accessed on January 29, 2018.

12. National University of Defence Technology or People’s Liberation Army National University of Defence Science and Technology is a top military academy with advanced research facilities. It is under the dual supervision of the Ministry of National Defence and the Ministry of Education. It was originally founded in 1953 as the Military Academy of Engineering, and in 1978, changed to NUDT.

What is more worrisome is the fact that these improvised gadgets can be bought “Commercially-Off-The-Shelf (COTS)” from toyshops or ordered online across the globe. A slight modification to these miniature flying platforms can enable them to have additional systems like GPS guidance, digital terrain mapping camera, GSM/RF (Radio Frequency) datalink, explosive bay, bomb release mechanism, etc.

Similar capabilities are being developed by the US. The Defence Advanced Research Projects Agency (DARPA) recently awarded a \$7.2 million contract to Raytheon BBN, Northrop Grumman Mission System and Lockheed Martin Corporation to develop challenging capabilities.¹³ The project is being financed under the Offensive Swarm Enabled Tactics (OFFSET) project. The proposed swarming systems would be capable of operating in unison with small infantry units and would help them accomplish a diverse range of missions in complex urban environments. Unlike the currently deployed large and expensive drones of the US military, this programme

focuses on small dispensable drones, with high end software and AI. The integrated programme would allow them to respond in harmony to the pre-fed mission objective or command. The group of drones would also operate autonomously and, at the same time, avoid crashing into each other while flying in close formation.

Large UAVs have repeatedly demonstrated their capabilities as a challenging variable in warfare tactics in the Bekaa Valley conflict, Gulf War, Afghanistan and, recently, in Pakistan. Advanced technology is demonstrating that small groups of networked and pre-programmed swarm drones could significantly change how military powers operate in the future battlefield. These new low cost, relatively quiet [low Infra-Red/Radar Cross-Section (IR/ RCS¹⁴)] weapon systems have many advantages as

13. Brandon Knapp, “DARPA Awards First Contract in Drone Swarms Project”, www.c4isrnet.com, February 21, 2018, <https://www.c4isrnet.com/unmanned/2018/02/21/darpa-awards-first-contracts-in-drone-swarms-project/>. Accessed on March 2, 2018.

14. Infrared signature describes the appearance of objects on infrared sensors. RCS is a measure of how detectable an object is on a radar.

compared to conventional aerial artillery like aircraft launched air-to-ground missiles, rockets and bombs. These strategic platforms, when compared with aircraft launched weapons, are not only cost-effective vis-à-vis the scale of disruption but also have measurably higher destructive power, vis-à-vis the degree of effort. These virtues weigh heavily towards the use of drones as ideal weapons for low cost, low intensity war. Further, detection and incapacitating these small/ micro UAVs requires sustained investment in research, training, security and defence mechanism. In a worst-case scenario, one low cost drone, with a very small quantity of ammunition, can disable a fully loaded aircraft if it hits it on the ground or during take-off. Therefore, drones and are now being referred to as the “poor man’s air force”.

The mass drone attack at Humaymin air base gives us a glimpse of new age battlefield tactics in low intensity conflict. A group of low-cost drones can also inflict appreciable damage to military/ civilian infrastructure. What is more worrisome is the fact that these improvised gadgets can be bought “Commercially-Off-The-Shelf (COTS)” from toyshops or ordered online across the globe. A slight modification to these miniature flying platforms can enable them to have additional systems like GPS guidance, digital terrain mapping camera, GSM/RF (Radio Frequency) datalink, explosive bay, bomb release mechanism, etc. Technology may soon make these platforms a favoured means of executing aerial attacks. Other factors may also include;

- low cost of fabrication;
- stealthy operation; and
- disproportionate gains.

Further, the advantage of ‘flexibility of operation’ and ‘large standoff distance’ inherent with the use of any aerial platform is also available with these machines. A cursory scan of the internet will show multiple websites marketing low-cost, high-performance drones with several facilities. The market volume of pre-assembled aero-models including the fixed-wing, rotary-wing and quadcopter has increased manifold in the last few years. According to the Consortium of Unmanned Vehicle Systems India (CUVSI), between the

As per market experts, the Indian drone market is worth over ₹ 100 crore with an estimated Compounded Annual Growth Rate (CAGR) of 18 percent.

Compounded Annual Growth Rate (CAGR) of 18 percent.¹⁶

years 2015-17, Indians have bought nearly 40,000 drones.¹⁵ These figures include toy drones, hobby UAVs and aerial platforms used by the media and film industry for live shots/ photography. The cost of these drones varies between INR 2,000 to INR 50,000 and they are easily available for sale across the counter without any regulatory control. As per market experts, the Indian drone market is worth over INR 100 crore with an estimated

FACING THE THREAT

Discreetly, most military commanders (and security experts) agree with the fact that presently there is no recognised or proven strategy to counter a mass drone attack. Use of conventional kinetic weapons as defence may be successful only if timely intelligence is available. Appreciating this new trend of threat perpetration, the best solution currently is to improve surveillance and the human intelligence gathering mechanism at the local level. Understanding the risk involved, the US Department of Homeland Security issued a countrywide bulletin warning the public regarding the use of drones, by terrorist groups. According to the latest advisory, issued on November 9, 2017, *“Some terrorist groups overseas are using battlefield experiences to pursue new technologies and tactics, such as unmanned aerial systems and chemical agents that could be used outside the conflict zones. Additionally, terrorists continue to target commercial aviation and air cargo, including with concealed explosives.”*¹⁷ The circular also had a column on *“How you can help,”* which solicited public

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15. Sailesh Menon, “Civilian Drones May Account for Bulk of UAVs in Indian Skies”, *The Economic Times*, July 6, 2017, <https://economictimes.indiatimes.com/industry/transportation/airlines/-aviation/civilian-drones-may-account-for-bulk-of-40000-uavs-in-indian-skies-despite-ban-by-regulator/articleshow/59464348.cms>. Accessed on February 5, 2018.
 16. “India UAV Market (2017-2023): Forecast by UAV Types, UAV Range, Application and Competitive Landscape-Research and Markets”, *Business Wire*, <https://www.businesswire.com/news/home/20170907005704/en/India-UAV-Market-2017-2023-Forecast-UAV-Types>. Accessed on March 5, 2018.
 17. US Department of Homeland Security, “National Terrorism Advisory System”, https://www.dhs.gov/sites/default/files/ntas/alerts/17_1109_NTAS_Bulletin.pdf. Accessed on February 24, 2018.

participation in recognising signs of suspicious terrorist activities and its reporting mechanism. With these actions, the department hopes to receive timely inputs (intelligence) about drones flying in unsolicited areas. Thereafter, conventional artillery can be used to destroy them.

However, if intelligence fails, preventing a swarm or mass attack by drones, using the current configuration of air defence equipment, is tough and challenging. India is no different. Military strategists and hardware developers across the globe, therefore, are now focussing on developing new technologies to face this unfolding challenge. In recent times, the following three counter-drone techniques have shown encouraging results:

- Hard kill by kinetic weapons, including anti-aircraft guns, missiles, air-burst ammunition, etc. that cause physical damage to the drone's structure, thereby disintegrating it in the air.
- Non-kinetic kill using EMP weapons, electronic jamming and lasers, that incapacitate the onboard electronic systems, causing them to miss the target or force (crash)-land outside danger area.
- Installing physical barriers like nylon mesh, jelly fish traps, etc that entangle the drones and cause them to crash.

While the first option is disproportionally expensive in terms of firepower, the results of option three are encouraging only within a restricted area. One seemingly successful way to approach this threat is the use of non-kinetic weapons or EMP guns like the Russian "Death Ray" and US "Aerial Drognet" to detect and disable the drones. However, for these EMP weapons to work, an effective radar-based early warning system has to be in place. The radar should be able to correctly identify the target and track its flight path. Thereafter, it should be able to guide the EMP weapon to kill the electrical/electronic system of the aerial vehicle.

Drones that are designed for mass attack are usually small, lightweight, slow and low flying platforms. They also have a very small IR/ radar signature (RCS).

The detecting, identifying and tracking drones from large standoff distances or the non-line-of-sight approach is difficult.

TECHNOLOGY BARRIERS

There are many difficulties in developing cost-effective technologies for monitoring or detecting earth flights of slow moving aerial vehicles. Drones that are designed for mass attack are usually small, lightweight, slow and low flying platforms. They also have a very small IR/radar signature (RCS). According to Dr Michael Caris¹⁸ of the Fraunhofer Institute for High Frequency Physics and Radar Techniques, Germany, nano UAS have an RCS of less than 0.01m² at a reference frequency of 10 GHz.¹⁹ This too is generated only by the onboard batteries, electric motor, servos and engines. Therefore, detecting, identifying and tracking them from large standoff distances or the non-line-of-sight approach is difficult. Radars that have all weather capability to identify drones flying at extremely low level are still at the prototype stage. According to experts at the Institute of Electrical and Electronics Engineers (IEEE), short range surveillance radars for detecting non-metal frame drones with less than 4ft width are technically very difficult to operationalise. The hardware and software to process the radiation feedback and issue credible warning would require very high-end AI and extremely fast processors.

DRONE DEFENCES

To face this menace, the security agencies and defence forces have been demanding a formidable weapon system from the industry. They want that the system should have features like light weight, be easily transportable have omni-directional radar with built-in EW jammers and laser-guided ammunition for short range engagement. For example, on September 13, 2016, DARPA solicited innovative technical research proposals for providing a persistent, wide-area surveillance system for detecting small UAS operating below 1,000 ft in urban terrain²⁰. The programme is code named Aerial

18. "FHR Security, Detection of Small Drones with Millimetre Wave Radar," <https://www.fhr.fraunhofer.de/en/businessunits/security/Detection-of-small-drones-with-millimeter-wave-radar.html>. Accessed on March 16, 2018.
19. RCS of other aircraft are B-52 – 100, F-16 – 5, Su-30MKI – 4, MiG-21 – 3, F-35 – 0.005, F-22 – 0.0001, source, Global Security.org, <https://www.globalsecurity.org/military/world/stealth-aircraft-rcs.htm>. Accessed on March 21, 2018.
20. "Aerial Dragnet-Solicitation Number-DARPA-BAA-16-55", FedBizOpps.gov, September 13, 2016, https://www.fbo.gov/index?s=opportunity&mode=form&id=84ea6bae9dc2a6e6437abeb570c3a77a&tab=core&_cview=0. Accessed on March 15, 2018.

Dragnet. Similar Requests-For-Proposal (RFPs) have been floated by many other militaries, including the Indian defence forces.

Fig 6: Krasukha-4 Weapon System



Source: Sputnik / Pavel Lisitsyn

Concurrently, the defence industries of some countries have demonstrated or published teasers about developing a formidable array of integrated systems to detect and destroy drones. The effective range of these EW weapons is generally 3-5 km only. Most omni-directional jamming radars can disable low-flying, slow moving hostile flying objects. These EMP weapons either blind the seeker or blank the command guidance system of hostile drones. One example of battleworthy hardware is the Russian 'Krasukha-4' (refer Fig 6). It is code-named 'Death Ray' by the North Atlantic Treaty Organisation (NATO). This system was supposedly used by the Russians to bring down the six drones in Syria²¹. Its powerful microwave pulse was able to blind the navigation and guidance system of the drones using powerful directed microwave energy. During 2017, Russia's largest small arms manufacturer, Kalashnikov, displayed its electromagnetic anti-drone rifle, REX-1, at the Army-2017 Expo in Moscow. It is capable of jamming/ suppressing GSM

21. Southfront, "Krasukha-4 in Syria: One Year of Electronic Shield Over Hmeymim Airbase", October 12, 2016, <https://southfront.org/krasukha-4-in-syria-one-year-of-electronic-shield-over-hmeymim-airbase/>. Accessed on February 24, 2018.

Most omni-directional jamming radars can disable low-flying, slow moving hostile flying objects. These EMP weapons either blind the seeker or blank the command guidance system of hostile drones.

(Communication) and GPS (Navigation) signals of drones.

Similar capabilities to shoot down drones are being developed by other countries. The British Anti-UAV Defence System (AUDS) can spot and identify unauthorised large [over 150kg All-up-Weight (AUW)] aerial vehicles at 10 km²². It can also sense micro UAVs (below 2 kg AUW) at about 2 km range. The AUDS uses Ku band electronic scanning radar²³ to identify the target. On recognising a threat, it uses precision infrared guided inhibitor radio signals to disable the controls of the drone. Analogous capabilities have also been developed by the French company CS Communication & Systèmes, which has developed the BOREADES integrated systems for targeting illegal drones.²⁴ Similarly, Airbus Defence and Space Inc, has developed a counter-UAV system against small drones which uses a combination of radars, infrared cameras and direction finders to identify a potential threat at a range of 5 to 10 km²⁵. The system does a real-time analysis of the control signal and then interrupts the link between the drone and its remote pilot using smart responsive jamming technology²⁶. Israel, China and Iran have also developed capabilities to counter drone attacks using a mix of kinetic and EMP weapons.

22. Martin Brooke, "British Counter-UAV Technology (AUDS) Selected by FAA for Airport Trials", <http://www.blighter.com/news/press-releases/130-british-counter-uav-technology-auds-selected-by-faa-for-us-airport-trials.html>. Accessed on February 25, 2018.

23. Radar is the acronym for Radio Detection And Ranging. A Ku band radar uses radio waves between 12-18GHz to determine the range, location, azimuth and speed of an object. The radar system is a radio trans-receiver. It sends a radio wave, which is reflected by the object with a slight change in frequency. The shift is analysed to determine the speed and location of object.

24. BOREADES: an operational French system to detect and neutralise malicious drones flight, https://uk.c-s.fr/BOREADES-an-operational-French-system-to-detect-neutralize-malicious-drones-flights_a584.html. Accessed on March 14, 2018.

25. Airbus, "Counter-UAV System from Airbus Defence and Space, Protects Large Installations and Events from Illicit Intrusion", September 16, 2015, <http://www.airbus.com/newsroom/press-releases/en/2015/09/counter-uav-system-from-airbus-defence-and-space-protects-large-installations-and-events-from-illicit-intrusion.html>. Accessed on March 4, 2018.

26. Ibid., SRJT, developed by Airbus, blocks relevant frequencies used to operate the drone, without affecting other frequencies in the vicinity

Analogous to developments in Eurasia, the US' Multi-Azimuth Defence Fast Intercept Round Engagement System²⁷ (MAD-FIRES) is being developed by Raytheon and Lockheed Martin in accordance with specification defined by DARPA in the September 2016 RFP. It will counter the attack from unmanned platforms by shooting a barrage of small calibre smart bullets²⁸. It will also serve as a Close-In Weapon System (CIWS) for ships. According to a report prepared by Transparency Market Research²⁹, the global anti-drone market was valued at about US\$214.7 million in 2016 and the figure is expected to climb to US\$1.205 billion by 2025. The forecast growth (CAGR) is 19.9 percent which is the highest in the defence sector industry. The demand for anti-drone systems is driven by the security concerns of not only military installations but also private enterprises that want to protect their privacy. As the drones are becoming smarter and stealthier, tracking, detecting and identifying them is becoming more and more difficult. This rapidly maturing anti-drone market is led by highly competitive innovators and start-ups. Technological advances are also likely to make anti-drone systems more effective and affordable to several users. The EMP-based drone neutralisation system is the preferred method for preventing intrusion, rather than the use of kinetic ammunition. The emerging markets for anti-drone equipment are the Central Asian countries, China, India, Israel, Russia, UK, Germany and France, to name a few.

INDIAN READINESS QUOTIENT?

In the wake of all these technological developments, it becomes imperative to deliberate on India's readiness quotient. The race to improvise small aero-models and toy quadcopters as weapons has already begun amongst terrorist groups across the globe. Terrorist groups in India are no exception to this growing trend. It is only a matter of time before these skills are acquired by extremist and terrorist

27. John Keller, "Raytheon and Lockheed Martin Move Forward in Developing Smart Nullets for Surface ship Defence", February 23, 2016, <http://www.militaryaerospace.com/articles/2016/02/shipboard-smart-bullets.html>. Accessed on March 5, 2018.

28. Patented in the USA in 1998, by R F Barrett, it is an in-flight bullet guidance system capable of directing it along a trajectory so as to impact a laser-identified static or moving target. The bullet contains the laser detection system, guidance-control and steering mechanism. DARPA's Extreme Accuracy Tasked Ordnance (EXACTO) programme demonstrated a .50 calibre bullet hitting a moving target in 2015.

29. Transparency Market Research, Defense, *Anti-Drone Market*, July 2018, <https://www.transparencymarketresearch.com/antidrone-market.html>. Accessed on March 14, 2018.

groups working against Indian interests. An intelligence failure at the local level or an undetected intrusion could jeopardise India's security situation. In view of these advances, there is an urgent need to secure our military establishments, public utility service centres and critical infrastructure from drone attacks. It is time India invests in improving the defensive mechanism and acquiring capabilities to fend off the threat.

Legally speaking, flying drones is not permitted in India³⁰. As per a public notice issued on October 7, 2014, by the Director General of Civil Aviation (DGCA), "Use of Unmanned Aerial Vehicles/ Unmanned Aircraft System for Civil Application", within the Indian civil air space is banned. However, the details of the prohibition were not well articulated or explained in the announcement.

Thereafter, in November 2017, the DGCA circulated a draft of proposed requirements for the operation of civil Remotely Piloted Aircraft System (RPAS) or drones. The regulation would be applicable to civil RPAs which are remotely piloted. It recommends that all RPAs have a Unique Identification Number (UIN) and all operators obtain an Unmanned Aircraft Operator Permit (UAOP). The UIN and UAOP would be issued by DGCA for all UAVs [except nano RPAs flying below 50 ft Above Ground Level (AGL)]. Nevertheless, micro RPAs can fly below 200 ft AGL in uncontrolled, unrestricted and unreserved areas with the permission of the local police administration. The draft policy also recommends a strict ban on the operation of autonomous aircraft (swarm drones).

Although the draft regulation clearly defines the procedure for registration and operation of UAVs in the Indian air space, it does not cover the manufacture or sale of RPAs. No method has been suggested to monitor this process along with any other ministry or department of the Government of India, thus indicating that items and components for fabricating/ manufacturing drones would continue to be available off-the-shelf in the Indian market, including e-commerce platforms. In this scenario, the assembly, fabrication and undetected use of drones as Improvised Explosive Devices (IEDs) for disruptive purposes cannot be truly ruled out.

30. DGCA, *Public Notice*, October 7, 2014, http://dgca.gov.in/public_notice/PN_UAS.pdf. Accessed on March 18, 2018.

According to the proposed regulation, the permission for operation of RPAs would be issued by DGCA. All RPA flights above 200 ft AGL would be issued with an Air Defence Clearance (ADC) code before commencing flying. The Airport Authority of India (AAI) and Indian Air Force (IAF) shall be responsible to monitor the movement of RPAs within the country's air space. However, in the case of the following categories of operation, written permission from the local police authorities may be required (Table 1):

Table 1

Sl No	Category	Condition
1.	Nano RPA [All Up Weight (AUW) below 250 gm] operating upto 50 ft AGL in uncontrolled air space and indoor operations	UIN/ UAOP/ ADC not required. Local police clearance not required
2.	Aero-models, nano and micro RPAs (AUW upto 2 kg) flying up to 200 ft AGL and within the boundaries of educational institutes including indoor operations	UIN/ UAOP/ ADC not required. Local police to be informed
3.	Micro RPAs, flying upto 200 ft in uncontrolled air space and clear of prohibited, restricted and danger area including Temporary Segregated Areas (TSA) and Temporary Reserved Areas (TRA) as notified by the AAI	UIN required, UAOP/ ADC not required. Local police to be informed
4.	Mini RPA (AUW above 2 kg) and above flying in any area	UIN/ UAOP/ ADC required. ATC and FIC to be informed when flying
5.	RPA owned and operated by government security agencies	UIN/ UAOP not required. ADC required. Local police and Air Traffic Services (ATS) to be informed

The best defence against drones in an emergent scenario is a combination of genuine ground intelligence, low-level 2D/ 3D radars and a powerful EMP/ DEW weapon.

In order to discharge these responsibilities, the AAI, IAF, ATS and local police administration would require additional resources, which may include technical infrastructure, manpower and a dense network of radars and observation posts. Additional financial resources for this also need to be mobilised by the concerned departments, concurrently.

Recently, the Defence Research and Development Organisation (DRDO) has demonstrated the capabilities of its low-level lightweight 2D radar (BHARANI) and 3D radar (ASLESHA). These transportable radars are capable of detecting low flying slow speed aerial vehicles having very small radar signatures. These radars have a certain degree of Electronic Counter Counter-Measure (ECCM) capabilities and can also be integrated into the existing Air Defence (AD) network for swift reaction. Radar systems like these may also be installed at civilian installations, critical infrastructures, VA/ VPs across the country. When integrated with the defence forces and police network, this arrangement may offer the first line of early warning against a mass drone attack. However, to disable or shoot down drones additional capabilities are required.

The best defence against drones in an emergent scenario is a combination of genuine ground intelligence, low-level 2D/ 3D radars and a powerful EMP/ DEW (Directed Energy Weapon) weapon. On one end, ground intelligence in the form of trained foot soldiers/ police personnel, networked mobile observation posts, IR surveillance cameras, etc would be capable of detecting unsolicited intrusions, through day and night. On the other end, post detection quick response kinetic and non-kinetic (DEWs) weapons would be required to neutralise the threat by shooting down drones.

THE WAY FORWARD

Presently, our security forces, like many others, rely profoundly on human intelligence and kinetic weapons as the primary defence against a mass drone attack. This arrangement is likely to be marred with surveillance gaps.

Appreciating this, the Technology Perspective and Capability Roadmap (TPCR)-2018 prepared by the Ministry of Defence, lists out certain technologies and equipment that the Indian defence forces would need to develop and acquire by 2020. Some of the proposed technologies/ projects are listed below³¹ (Table 2):

Table 2

Sl No	Project	Description	Services
1.	Anti-UAV/ RPA Defence System	The system should be capable of disrupting and neutralising RPAs engaged in hostile airborne surveillance or any other activities. It should have combination of electronic-scanning radar target detection, Electro-Optical (EO) tracking/ classification and directional Radio Frequency (RF) inhibition capability. The system should also be able to remotely detect all RPAs from micro to Medium Altitude Long Endurance (MALE) UAVs. It can be operated in restricted/ open RF bands. Detection range > 40 km, EOTS range > 12 km and RF inhibition range > 7 km	Army and Air Force
2.	Tactical High Energy Laser System	The HMV-based laser weapon system should be able to cause physical damage/ destruction to communication/Electronic Warfare (EW) systems, including ground-based and aerial targets.	Army and Air Force
3.	High Power Electromagnetic Weapon System	The HMV-based high energy EMP weapon system should be capable to neutralise the enemy's electronic and electrical system (including RPAs) in the tactical battle area at a range of 6-8 km or more.	Army and Air Force

31. Ministry of Defence, "News-What's New", February 23, 2018, https://mod.gov.in/sites/default/files/tpcr_0.pdf. Accessed on March 12, 2018.

Technology has a way of fundamentally altering both the rules and philosophies of conflict. Recently, there has been a paradigm shift in the strategies of conflict which is centred around technology of weapons, swarms of drones, space, cyber interference, etc to name a few. Put together, these developments have made the concept of war in this century as new as the use of gunpowder in the 13th century. Drones or UAVs pose a clear and present danger to the security of our VA/VPs. It is, therefore, imperative that India take note of the changing nature of conflict. The approach adopted by various ministries to the problem are steps in the right direction, but a sense of urgency is required to tighten the noose on mass drone attacks.

While the Indian Micro Small and Medium Enterprises (MSMEs) and international aerospace giants are seriously competing for developing and producing³² micro and mini UAVs for various applications, the anti-drone industry is yet to take off. There is a need to concurrently push for induction of anti-drone equipment and system by security agencies. Apart from working on the indigenous development of technologies for drones, the security establishment needs to understand the impact of weaponised drones on India's internal defensive capabilities. Unless this happens at a faster pace, India risks preparing for a war against 21st century militaries (and militia) with a 20th century arsenal. Consolidated efforts across the board are required to fight this challenge.

32. The Qualitative Requirements (QRs) and Trial Directives for Micro UAVs were approved by the Police Modernisation Division of Ministry of Home Affairs, GoI, on August 12, 2014. This enabled the police forces including Central Armed Police Forces (CAPFs) across the nation to procure UAVs under the Police Modernisation Programme. The action also revitalised the MSME sector to innovate and manufacture drones as per the set QRs. According to the market research portal 'Research & Market' the Indian drone market is expected to reach \$421 million by 2021, primarily driven by security concerns.

NATIONAL APPROACHES TO NUCLEAR CIVIL DEFENCE: AN ASSESSMENT

ROHIT KAURA

Since the advent of the Nuclear Age, everything has changed save our modes of thinking, and we, thus, drift towards unparalleled catastrophe.

— Albert Einstein

INTRODUCTION

A large-scale nuclear attack on a modern industrial nation would typically cause a scale of damage that would be beyond a self-repair point. It is quantitatively and qualitatively distinct from a conventional conflict. The damage caused to a modern country would be widespread and extensive, disrupting many dimensions, destroying vast regions and making many more unlivable. Communications and essential services would be degraded and interrupted, putting governments out of action, partly or wholly. Damage to power and water supplies would affect industrial production and commerce, stopping the regular and complex interflow of goods and supplies. Severe problems with food stocks and housing would arise. Health impacts would be on an unimaginable scale. Factually, it would be a humanitarian disaster.

No one can deny that there is no complete protection against a nuclear attack and at ground zero, all life and property would be destroyed. Many survivors will be in the damaged outer ring and beyond, and their plight will

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During the Cold War, the superpowers were in an unhealthy relationship and feared a nuclear attack. Due to this fear, they resorted to civil preparedness programmes to mitigate life and property loss. Despite these, however, they could not find complete answers, easy answers or even rational answers for protection against a possible nuclear attack.

depend upon the distance, and the degree of protection. The outcome of the attack would be unevenly spread. Some stretches might escape the blast and thermal damage, but all would be in the lethal radioactive fallout danger zone. In such circumstances, measures such as fallout shelters, refuge, education and civil defence may reduce the fatal numbers. During the Cold War, the superpowers were in an unhealthy relationship and feared a nuclear attack. Due to this fear, they resorted to civil preparedness programmes to mitigate life and property loss. Despite these, however, they could not find complete answers, easy

answers or even rational answers for protection against a possible nuclear attack. This paper examines some such measures taken by countries to give their people a fair, reasonable chance to survive and recover from a nuclear attack. The paper's primary aim is to study these steps and analyse their success rate with the final goal of deciding what is needed in the Indian situation.

UNDERSTANDING THE ATTRIBUTES OF A NUCLEAR ATTACK

Impact At, and Close to, Ground Zero: The first level in planning for protection against a possible nuclear war is to be aware of the grave dangers that people could face if an attack should come. The main effects of nuclear weapons are intense light, heat, blast, and radiation. Their intensity depends on many variable determinants: the size and weapon type; the distance from ground zero; weather conditions (sunny or rainy, windy or still); the terrain (flat ground or hilly); and the burst height (high in the air or near the ground). The impact on people after a nuclear attack would depend on their proximity to a nuclear explosion. People close to the blast would be killed or injured by the immediate effects such as from the blast, initial radiation, heat, fire, and fallout. They would need shelters durable enough to resist

the blast pressure; and heat and fire-resistant shelters made from thick materials to shield against initial radiation and fallout. Protection from blast and heat, and focussing on ways to prevent fallout penetration will save lives. Shelters protecting from the blast, heat, and fire will also give adequate protection from the fallout. For people located away from the target and for survivors in an area of lighter damage, the radioactive fallout would be the principal threat.

Fallout Impact: The fallout spread after a nuclear explosion will depend on wind and other weather conditions present at that time. There are no means of predicting where the fallout will hit and how quickly the particles will settle back to the Earth at a particular place. Some spaces may receive a high fallout, while others, even those in the same general stretch, may receive little or none. Cities close to a nuclear explosion may endure fallout in fifteen to thirty minutes. It takes five to ten hours or longer for the particles to drift down on a region 150-300 km away. After the fallout starts to settle, the first twenty-four hours are the most dangerous. The larger particles falling during that time will still be radioactive and emit intense rays. The smallest, dust-like lighter particles may not fall back to the Earth for months or years. Their presence in the atmosphere will lead to higher radiation. No clothing can protect people against gamma radiation, and no individual drugs or chemicals can prevent massive radiative doses from causing damage to body cells.¹

Long-term Impact on the Environment, Economy and Health: Fires from even a 'limited' war would result in enough soot in the atmosphere to block sunlight and lower temperatures. The temperature drop would be unevenly spread, with huge declines occurring in continental interiors which have mostly agricultural land. The temperature change would also subdue and disrupt precipitation as well. To make matters worse, soot

The fallout spread after a nuclear explosion will depend on wind and other weather conditions present at that time. There are no means of predicting where the fallout will hit and how quickly the particles will settle back to the Earth at a particular place.

1. "Is It Possible to Survive a Nuclear Attack?" <http://www.family-survival-planning.com/nuclear-attack.html>. Accessed on October 25, 2017.

in the upper atmosphere will deplete the planet's ozone layer, further harming plant growth and human health. The combined decreases in average temperature, precipitation, sunlight and stratospheric ozone would result in shorter growing seasons. This will decrease agricultural produce for several years leading to widespread food scarcity. Damage to roads, railways, bridges and inland waterways, together with the failure in electricity supply and communication networks, will result in public stress, leading to heightened fears among the people. Extensive damage to the public water supply, sewerage disposal system and the inability to collect and dispose of refuse will create severe health problems. The spread of many diseases can be prevented if urgent steps are taken. The emotional impacts of a nuclear attack vary. Some will survive the post-traumatic chronic stress and fear, while others, who have been exposed will worry about delayed radiation health impacts. Clean-up, restoring, and replacing lost property and provisioning goods and services could cost crores of rupees. Heightened spending could affect the economy. The available resources will be insufficient to meet the needs of the survivors. The economic impact will continue if people are slow to return to the affected area even after the site has been cleaned up. How the attack unfolds, and its aftermath is handled, may result in loss of confidence among the people.

Monitoring and Clean-up of Affected Cities: Officials are expected to put in place plans to monitor, and control the affected areas; impose quarantines to prevent further exposure; remove contamination from neighbourhoods where people might stay on; and keep residents apprised. Public health officials should be able to recognise contaminated food and water, such as milk and produce, and replace them with clean food from outside the region. Sites tainted with long-lasting active radioactive isotopes will need clean-up exercises. Most radioactivity will dissipate after undertaking the clean-up exercise. It may take from a few weeks to months to remove the contamination. Water treatment and collecting soil from contaminated sites are huge problems. It involves using fixative sprays such as flour and water mixtures, oil, or water to wet ground facades. The above measures enable fixing the radioactive materials in place

and stopping its spread. The accident at the Fukushima Daiichi nuclear power station resulted in significant challenges for clean-up. These issues include treating contaminated water, debris, soil, secondary wastes, damaged spent fuel within the reactor, spent fuel pools, and damaged fuel and debris within the reactors.

PRINCIPLES OF PROTECTION²

The Hiroshima and Nagasaki nuclear bombings collectively led to an estimated 2,37,000 deaths. Most deaths and injuries occurred in burning houses or were caused by debris. To protect from the heat and blast fires is a challenging task. Evacuating or sheltering people is possible if adequate warning time is available. Time, distance, and shielding offer the best protective means for people far away from neighbourhoods threatened by the blast and fire. They essentially need protection from the fallout. The radiation level can be reduced by controlling the length of time of the exposure to it. Further, increasing the distance from the fallout particles and protecting with some absorbing or shielding materials can enhance the chances of survival.³

- **Time:** The danger from the fallout lessens with time. Radioactive decay is rapid at first and then gets slower and slower. The dose rate (the radiation amount received per hour) decreases with time. The fallout loses its intensity rapidly; it poses the most significant threat during the initial two weeks, after which time it diminishes to 1 percent of its initial level. Thus, limiting or minimising the exposure time decreases the dose from the source. Within two weeks after an attack, the inhabitants can stop using shelters and can work outside for an increasing number of hours. However, dense fallout regions such as those downwind from important targets such as missile sites and vast cities, would be exceptions
- **Distance:** The farther one is from ground zero, the greater will be the chances of survival. Like the heat from a fire is less intense the farther

2. "Nuclear Attack: Communicating in a Crisis", https://www.dhs.gov/sites/default/files/publications/prep_nuclear_fact_sheet.pdf. Accessed on October 25, 2017.

3. "Planning Guidance for Response to a Nuclear Detonation", https://www.fema.gov/media-library-data/20130726-1821-25045-3023/planning_guidance_for_response_to_a_nuclear_detonation__2nd_edition_final.pdf. Accessed on October 25, 2017.

An enemy attack on the country would be preceded by a period of growing international tension or crisis. This crisis period would alert citizens to a possible attack and should be used to prepare for the emergency.

away one is, the intensity and the radiative dose also decrease as the distance increases from the source. One good survival strategy is to be far from cities that could represent potential targets. Moving as far away as possible from harbours, military complexes, or other strategic facilities can also help to keep one safe from nuclear dangers. If one is in a fallout zone and is not sheltered, doubling the length from the radiative source will result in reducing the receiving dose by a factor of 4.

- **Shielding:** Thicker and denser materials

like thick walls, concrete, bricks, and earth can afford significant shielding from radiation. One way to lessen exposure is to move to a place that renders a protection factor of at least 100.⁴ An underground space such as a home or office building basement protects more than the building on the first floor. The apartment basement or office building presents a protection factor of 200 and can bring radiation levels down to two-hundredth of the outdoor dose. A single-storey building provides a protection factor of 2 (the fallout reduces by 50 percent).⁵

MEASURES FOR PROTECTION

Early Warning: An enemy attack on the country would be preceded by a period of growing international tension or crisis. This crisis period would alert citizens to a possible attack and should be used to prepare for the emergency. Regardless of whether civil defence planning relies on a system of shelters or mass evacuation, the population will need timely warning that they are in danger and that the government is implementing its civil defence measures. Traditionally, during the Cold War period, there were two kinds of alarms:

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4. The radiative intensity in the shelter is one hundredth or less than outside. Eighteen inches of earth or twelve inches of concrete can bring the levels down to one-hundredth of the outdoor dose.
 5. "In a Nuclear Attack, There's no Avoiding the Brutal Math", <https://www.sciencenews.org/blog/gory-details/nuclear-attack-there%E2%80%99s-no-avoiding-brutal-math>. Accessed on December 20, 2017.

short-term warning, timed in minutes, that a nuclear attack was imminent; and a longer-term warning, of hours or days, to the effect that an attack may take place. The radio or television, or the outdoor warning system installed in a city or town will give warnings. One needs to keep abreast of the news through the media: emergency information being broadcast or printed in the newspaper. Many communities have outdoor warning systems that use sirens, whistles, loudspeakers, or other devices to warn or alert citizens about natural disasters and other peace-time emergencies. The same can be adapted to indicate alert and attack in the community. Recently, the Chinese state media shared concerns over North Korea's nuclear and missile programme and advised its readers on "how to survive a nuclear attack".⁶

Before developing the intercontinental ballistic missiles, the US and the Soviet Union believed that there would be several hours of warning of an attack that was underway. With missiles, however, this warning time reduced to less than 30 minute, depending on the missile flight time from one country to the other.

Early Warning Challenges: The nature of the warning will define what actions are practical. Before developing the intercontinental ballistic missiles, the US and the Soviet Union believed that there would be several hours of warning of an attack that was underway. With missiles, however, this warning time reduced to less than 30 minutes, depending on the missile flight time from one country to the other. The warning times are further reduced for nuclear missiles fired from submarines, which could come close to the coast. In the latter case, there is no possibility of starting and completing evacuation. In a situation when it appears that the crisis may worsen with the nuclear weapons use, it is important to undertake evacuation plans within a few days. Also, there is the risk of misinterpreting a crisis due to ambiguous or false warnings. In some cases, warnings could make the crisis worse and create panic among the public.

6. "Chinese State Media Tells Readers How to Survive a Nuclear Attack", <https://www.reuters.com/article/us-northkorea-missiles-china/chinese-state-media-tells-readers-how-to-survive-a-nuclear-attack-idUSKBN1E00EF>. Accessed on January 9, 2018.

Fallout Shelter: A shelter can be the basement or inner corridor of any prominent building. It can also be a basement of a private house, a subway or a tunnel, or even a backyard trench, with shielding material. There are two kinds of shelters: blast and fallout. Depending on its strength, a blast shelter protects against blast pressure, initial radiation, heat and fire. Most civil defence plans have focussed on shelters against fallout rather than against the blast, since the fallout is likely to travel much farther from the explosion and endanger far more people. Fallout shelters are meant to protect people who have survived the initial blast, from heat and initial radiation effects. A fallout shelter does not need to be a special building or an underground bunker. It can be any place, provided the walls and roof are thick or heavy enough to absorb the radiation of the fallout particles outside. The first few days after an attack would be the most dangerous time. How long people should stay in a shelter would depend on how much fallout has been deposited in their region. In most cases, the radiation levels outside the shelter will drop sufficiently to permit people to leave the shelter in a few days. Even in regions that receive a heavy fallout, people may soon leave their shelters for a few minutes or even a few hours at a time to perform emergency tasks. The need for full-time sheltered occupancy will not be for more than a week or two. Information from trained personnel specialising in monitoring radiation using special devices to detect and measure the fallout intensity, and supported by analysis from the local authority scientific advisors, would be used to inform people when it is safe to leave the shelter⁷.

Shelter Management Challenges: A blast shelter will not withstand a direct hit and will be of no aid to people caught in the fireball; they will have no chance of survival. So, people living in or near possible targets, or high-risk areas may wish to move to safer neighbourhoods and seek fallout shelters, if the period of international tension allows time to relocate before a nuclear strike. Besides protecting people from fallout radiation, most fallout shelters will also render a limited shield against the heat and blast effects of a nuclear explosion even if not nearby. Shelters are of little use in massive fallout areas unless the occupants have enough life support equipment. Most shelters would

7. "In Time of Emergency", <http://www.beyondweird.com/survival/intimeof.html>. Accessed on October 26, 2017.

be crowded; except in cold weather, most would need a ventilating pump to remove warm air and bring in cooler outdoor air to maintain survivable temperature-humidity conditions. Fallout radiation does not contaminate food and water in dust-tight containers. Peeling fruits and vegetables removes the fallout from them. So does removing the uppermost several inches of stored grain onto which fallout particles have fallen. If fallout particles do not mix with the food, no harm is done. Water is not affected by radiation, and it becomes dangerous only if the radioactive particles themselves get into the water. There are efficient ways to decontaminate water containing radioactive particles. A simple filtering process can remove the particles, using paper or cloth, or by filtering it through clay soil. Garbage is kept in sealed containers and piling of garbage is not allowed inside the shelter for fire and hygiene reasons. Further, one needs to dispose of the waste outside the shelter when it is safe to do so, and if feasible, to bury it.

Evacuation: In the early Cold War years, before the arrival of long-range ballistic missiles, both the US and the Soviet Union planned to take advantage of the large, sparsely populated areas available in their countries by evacuating civilians from the large cities in case of a nuclear crisis event. Evacuation involves moving people from high-risk zones⁸ to low-risk zones⁹. If one is in a high-risk neighbourhood, one may be exposed to the direct blast, heat, and radiation effects of a nuclear explosion. By relocating to a safer region, the risk exposure is restricted to the fallout. The chances of combating only the fallout hazard are much higher than enduring the direct nuclear weapon effects. Further providing or improvising fallout protection in various buildings is much simpler and more manageable than coping with the direct nuclear forces. The central/state and local governments need to plan for the orderly relocation of people during periods of international tension. It calls for relocating people from high-risk to low-risk host states for improving and devising fallout protection in the host areas. These plans could be practised not only under an intimidating nuclear attack but also during other crises like

8. High-risk zones are metropolitan centres of 50,000 or more population, and spaces near military, industrial, or economic areas of importance.

9. Safe regions are areas where nuclear weapons are not likely to be targeted. These are the surrounding small towns and rural expanses and will become the host centres in the event of an emergency relocation to high-risk zones.

Regardless of whether evacuation is preceded, or followed, by an attack, such plans are seen as unrealistic. It is hard to imagine or plan in detail for the chaos presented by such mass movements of people in difficult circumstances or to mobilise the policing resources to make evacuation manageable.

floods, earthquake, etc. Local authorities are competent for carrying out such planning because they are familiar with the local circumstances affecting evacuation.

Evacuation Management Challenges:

Regardless of whether evacuation is preceded, or followed, by an attack, such plans are seen as unrealistic. It is hard to imagine or plan in detail for the chaos presented by such mass movements of people in difficult circumstances or to mobilise the policing resources to make evacuation manageable. Rural citizens will be strained to absorb this high influx of refugees, many of whom will

be without adequate food or shelter. Feeding and caring for large numbers of displaced individuals in remote districts with insufficient infrastructure requires a phenomenal effort. High efficiency and improvisation would be required from the host communities, and from the evacuees, a high degree of cooperation. If a person does not move when asked to do so, he/she may become subservient to strictly enforced curfews. Movement within the section may be restricted to protect property, and it is possible that most facilities or services ordinarily available will not be provided during the relocation period. Supply to the relocated people will need much of the available goods and provisions. The best existing public shelters will be reserved for the essential workers, who will remain to carry on vital industries, and for the hospitalised people who cannot be relocated.

Education: Civil defence relies on widespread participation and support from the people. Sharing information with the people about what to do in case of a nuclear attack, helps in building confidence and trust in government plans. Information booklets and study materials are used to educate the public. These inform about the effects of nuclear weapon and the actions needed in implementing the nuclear civil defence plans. If people do not know, or are unaware of, how to

protect themselves from the fallout, the whole plan is pointless and may even be counter-productive. At school, children are taught to hide under their desks in case of a nuclear attack. They even have practice drills. Children's songs have been conceived that have a message about nuclear preparedness. Many videos on shelters have been produced and exhibited to the public as well, and the most famous one was a movie for children called "Duck and Cover"¹⁰.

Education Management Challenges: During the Cold War, the civil defence education did create an adverse effect in the minds of the American public. If a nuclear attack is in the offing, it will naturally create tension and make the public fearful. President Eisenhower recognised the harmful effects of nuclear fear on Americans and cautioned the people, "We do not have to be hysterical. We can be vigilant."

MAJOR POWERS' APPROACH TO NUCLEAR CIVIL DEFENCE

Civil defence may be described as the fundamental urge for self-survival. With the nuclear weapons arrival, civil defence took on a different perspective from that held during World Wars I and II. The Soviets exploding their first atomic weapon in August 1949, marked not only the commencement of the nuclear arms race but also heightened the possibility of a nuclear war and increased emphasis on a stepped-up civil defence programme. Civil defence was discussed much more during the Cold War, when the nuclear attack spectre shaped the popular culture and was prevalent in politics. The most well-known instances are from the US and UK, both because of their more open societies and the anti-nuclear movements challenging such civil defence plans in these countries.¹¹ Limited specific information is available about the erstwhile USSR's efforts, and still less about other nuclear weapon countries. Most Western European countries, as members of the North Atlantic Treaty Organisation (NATO), had some limited civil defence plans, while Sweden

10. *Duck and Cover*, directed by Thomas Craven (New York: Archer Productions, 1952).

11. A notable example of this was the British government-issued civil defence pamphlet "Protect and Survive" that led anti-nuclear activists there to produce the famous response *Protest and Survive*; E P Thompson and Dan Smith, eds., *Protest and Survive* (London: Penguin, 1980).

Civil defence was discussed much more during the Cold War, when the nuclear attack spectre shaped the popular culture and was prevalent in politics. The most well-known instances are from the US and UK, both because of their more open societies and the anti-nuclear movements challenging such civil defence plans in these countries.

and Switzerland had more extensive plans.¹² For a proper understanding of civil defence issues, it is necessary to have a brief look at the civil defence history.

Nuclear Civil Defence in the US:

During the Cold War, the US began a shelter identification programme, during which the government marked (with yellow and black radiation signs) more than a quarter of a million basements, corridors and caves that were supposed to protect from nuclear fallout. Some were stocked with water, food and medical equipment, but many lacked adequate ventilation and sanitary facilities to enable people to live in these shelters for long periods. In the US, a national warning

system operated on a 24-hour basis, transmitting warnings to over 1,200 federal, state and local monitoring points. Further, the local warning points used sirens and other means to alert the public. It was estimated that about only half the US population would be in regions where such warnings could be received within 15 minutes of a national alert. The public response among those who heard such sirens was by no means reliable: sirens that went off in 1955 in Oakland, California, were identified as an attack warning but were nonetheless ignored by 80 percent of the residents.¹³ The US intended to construct special bunkers for its federal and government leaders but did not seek a programme of building blast shelters for the citizens. In the early 1960s, President Kennedy made a strong appeal for civil defence: "In the event of an attack, the lives of those families which are not hit in a nuclear blast and fire can still be saved if they can be warned to take shelter and if that shelter is available. We owe that kind of insurance to our families, and to our country"¹⁴. The period from 1961 to 1965

12. Civil defence stratagems in the US, USSR, UK, Sweden and Switzerland are represented in "London Under Attack", from which the analysis draws heavily.

13. *Ibid.*, n. 12.

14. Thomas T Kerr, *Civil Defense In The United States: Bandaid For A Holocaust?* (Boulder, Colorado, Westview Press, 1983).

marked the most significant progress achieved in identifying and establishing procedures for a nationwide fallout shelter system. But, these successes were soon replaced with the Vietnam War costs, as well as a growing reluctance to support extra civil defence funding. Throughout the Sixties and into the Seventies, appropriations for civil defence funding showed a steady decline. From a 55 percent high of the total Department of Defence (DoD) budget in 1962, the civil defence budget declined to only 10 percent in 1970, ending the shelter programme. Only the shelter signs on some buildings remained¹⁵. In 1983, Ronald Reagan announced the Crisis Relocation Plan that would allow for evacuation from the cities to the rural expanses. It planned for saving 80 percent of the population wherein 145 million Americans in high-risk zones would be evacuated to the rural domains using private vehicles and would be lodged in schools, churches, etc. The US national highways were part of making this plan more feasible, and the plan cost was \$10 billion. People were expected to bring their food supplies with them as part of the evacuation and to build fallout shelters for themselves in the areas to which they were moved. Under the most optimistic assumptions, this plan was anticipated to take many days to execute. The programme created a storm and protests much like the ones stirred up when Kennedy had advocated a large increase in civil defence funding 20 years earlier. US government studies admitted, for example, that “evacuation from the populated Boston to Washington and Sacramento to San Diego corridors, with millions of people and limited relocation areas, may prove impossible”¹⁶. Recognising these problems, many community groups throughout the country demanded that their local governments and state government, refuse to take part in the programme. The situation was aggravated by some federal government arms questioning the programme’s feasibility, and Congress eventually cut the requested funding from \$252 million to \$152.3 million, and led to the ‘crisis relocation plan’ being abandoned. These events have combined to once again leave the future US civil defence programme in limbo¹⁷.

Nuclear Civil Defence in the UK: The UK made plans in the 1950s to evacuate 45 percent of its densely populated cities, which, after several years

15. n. 12, p. 279 and 266.

16. Ibid., p. 52.

17. Ibid., p. 268.

Along with communicating the warning, the UK Warning and Monitoring Organisation had the added responsibility of managing 870 stations networks to take radioactivity readings after an attack and predict fallout patterns. But it was not clear how the communication and monitoring system would itself withstand the effects of a nuclear war.

of debate became downgraded to an option to move just women and children from the major cities. This too gave way by the early 1970s, as the British government civil defence plans urged people to “stay at home” because the government would “not help you with accommodation or food or other essentials”¹⁸. Britain had an extensive warning system to warn the public about an incoming nuclear attack and fallout patterns after the explosion. The warning would be transmitted to major police stations that would sound sirens to warn the public to take cover. Some 8,000 sirens were in use; although again, the public response was far from certain – it is reported that the response of most people in

Coventry to a 1984 early morning siren was to turn over and go back to sleep¹⁹. Along with communicating the warning, the UK Warning and Monitoring Organisation had the added responsibility of managing 870 stations networks to take radioactivity readings after an attack and predict fallout patterns. But it was not clear how the communication and monitoring system would itself withstand the effects of a nuclear war. Because of the enhanced fear of a nuclear attack during the Cold War and recognising that people rarely live close to where the buildings that had been marked as shelters might be, the UK government distributed information and materials on how individual families could construct fallout shelters at home. These shelters were meant to protect people from the fallout radiation in the event of a nuclear attack²⁰. The most famous civil defence education effort may well be Britain’s 1980 brochure, “Protect and Survive”. The brochure noted, “If the country were

18. ‘Project and Survive’ cited in n. 12, p. 263.

19. n. 12, p. 28.

20. Cresson H Kearny, *Nuclear War Survival Skills* (Coos Bay: NWS Research Bureau, 1980), pp.154-204

ever faced with an immediate nuclear threat, a copy of this booklet would be distributed to every household as part of a public information campaign which would include announcements on television and radio and in the press²¹. Its goal was to tell people “how to make your home and family as safe as possible under a nuclear attack” by informing them of the steps to take to protect themselves from the blast and the fallout. After a quick explanation of the nuclear weapons’ effects, the brochure included guidance on what to do on hearing an attack warning siren, an all-clear siren or a fallout warning siren. A checklist was given with each pamphlet so that families could know whether they had the necessary elements for a survival kit, including foodstuff and water for drinking and washing for 14 days, along with a portable radio and spare batteries, and utensils²². The family, with its survival kit, was to take shelter in the fallout room that the brochure gave instructions on how to construct. The “Protect and Survive” report was met with derision. It served only to fuel a massive anti-nuclear movement in Britain that called for unilateral nuclear disarmament, arguing that the more specific defence against a nuclear attack was for Britain not to have nuclear weapons²³.

Nuclear Civil Defence in the USSR: The former Soviet Union took a different approach from the US to the role of blast and fallout shelters in civil defence. The Soviet Union endeavoured to provide blast shelters for both its leadership and up to a quarter of its workforce in critical industries²⁴. But, it was clear that even the Soviet Union did not attempt to protect more than a fraction of its entire population. Also, people needed to remain inside the shelters for up to two weeks or longer to allow time for the radiation to decline. At the same time, it was unclear how secure the shelters that were constructed would, in fact, have been. Soviet plans suggested using a bicycle connected to a fan to ventilate the shelters. It was such self-help measures that in part made the nuclear civil defence plans open to ridicule. Soviet evacuation plans were massive, involving

21. “Protect and Survive” <http://cybertn.demon.co.uk/atomic/main.htm>. Accessed on January 4, 2018.

22. The list also included, among other things, a clock, bedding, portable stove, fuel and cooking pots, torches with extra batteries and bulbs, candles and matches, changes of clothing, toiletries, first aid supplies, notebook and pencils, cleaning supplies

23. Thompson and Smith n.11.

24. n. 12, p. 273.

Soviet Union did not attempt to protect more than a fraction of its entire population. Also, people needed to remain inside the shelters for up to two weeks or longer to allow time for the radiation to decline. At the same time, it was unclear how secure the shelters that were constructed would, in fact, have been.

moving out 100 million people or more from cities believed to be at risk of a nuclear attack. But, there were questions about the viability of such plans also. It was estimated that there were only about 10 million vehicles in the country and a sparse road network, while the railway lines would not be able to cope with the demands of such traffic. It was no surprise that there were reports of “widespread apathy or outright mockery” among Soviet citizens of such civil defence ambitions²⁵.

Nuclear Civil Defence in Sweden: In the case of Sweden, its geographical position and historical background have played a crucial role in determining the course of the civil defence organisation. Sweden attaches extraordinary importance to civil defence measures such as the construction of bomb-proof shelters, evacuation planning, hardening of potential targets and building up of well-trained and efficient cadre of civil defence workers. Sweden’s civil defence plans involved large blast shelters for the public. During the Cold War, to protect the Swedish population from the potential nuclear threat, the government established over 65,000 shelters. The goal in the 1980s was to shelter five million of Sweden’s over eight million people and to offer shelter to the whole population, both at work and at home²⁶. The Swedish government granted subsidies of several hundred dollars per person sheltered. The money was not intended to pay for building the shelter but only to meet the cost of converting existing buildings (in schools and health clinics, etc.) so that they could serve as shelters, if required. From the beginning, the Swedes have been great believers in the shelters’ policy and their efforts have attracted worldwide attention. Sweden is, thus, looked upon as the ‘envy of the world’ in civil defence matters. According to recent reports, nuclear war shelters are being readied in Sweden to prepare for a

25. Ibid., p. 271.

26. Ibid., p. 276.

surprise attack²⁷. Sweden also made detailed plans for evacuating its cities in the 1950s and has made it a part of its national plan, but, over time, has moved towards reliance on a system of shelters and more limited evacuation. Sweden did plan for the evacuation of many towns and small target areas out into the safer countryside.

Nuclear Civil Defence in Switzerland: In Switzerland, civil defence is given the status of a service. The Swiss made great strides in civil defence in the post-World War II era and made it obligatory for all males between the ages of 15 and 65 to serve in civil defence for 146 days each year. Women, whose services were not compulsory, could volunteer if they liked. In Switzerland, almost every building has a protective blast shelter system in the form of a reinforced concrete basement. Switzerland has built an extensive fallout shelter network during the Cold War, including the Sonnenberg tunnel and has air-raid and nuclear-raid sirens in every village. The book *Nuclear War Survival Skills* by Cresson H Kearny declared that, as of 1986, "Switzerland has the best civil defence system, one that already includes blast shelters for over 85 percent of all its citizens"²⁸. The government has encouraged building shelters as part of its civil defence plans in all seriousness and has contributed immensely to it. As per 1980 estimates, average government contribution to building shelters per person was almost a thousand dollars. On an average, the Swiss federal government reimburses 20 to 25 percent of the cost of shelter construction to the local governments. The Swiss have ensured a very high degree of protection due to the government's policy of shelter construction on a national scale and maintenance of trained civil defence workers²⁹. The shelters were meant to be occupied for an extended period, reflecting the understanding that the population needed to be protected from the fallout resulting from a nuclear war involving the superpowers in Europe. Switzerland seems to have had little, if any, sustained faith in the feasibility of mass evacuation and did not consider evacuation at all, choosing to rely instead on its shelter programme.

27. "Sweden Updates Hundreds of Nuclear Bunkers | Norad Shelter", <https://noradshelters.com/sweden-updates-hundreds-nuclear-bunkers-amid-fears-new-cold-war-russia/>. Accessed on January 3, 2018.

28. Kearny, n. 20, pp. 6-10.

29. n. 12, p. 279.

CONCLUSION

The more one knows about the dangers of nuclear weapons and the strengths and weaknesses of humans, the better the chances of survival. In the Western countries, strong civil defence plans were at odds with the principle of “Mutual Assured Destruction” (MAD) and were not rightly accomplished. Further, full-fledged, total defence required extensive funds. It seems that neither the people nor the government believed that any real protection against nuclear attack was possible and saw efforts at civil defence as impractical against the powerful destructive nuclear weapons forces, and, hence, a waste of time and money. Governments in most Western countries, except Switzerland, decided to underfund the civil defence due to its ineffectiveness. The civil defence measures against a nuclear attack were implemented in the face of widespread apathy and doubt. After the Soviet Union’s downfall and the end of the Cold War, civil defence fell into neglect. Since then, there has been limited focus on nuclear war and more attention has been given to natural disasters, climate change and defence against a terrorist attack involving chemical or biological weapons.

India must learn the right lessons from the experiences of the major powers of the Cold War period. While preparing for civil defence seemed politically desirable, it was economically burdensome and not security engendering in real terms. It is worth noting that while these countries did succeed in safeguarding a handful of top military, bureaucratic and political leaders against a nuclear attack, each country eventually ended up relinquishing the goal of large-scale civilian protection from a direct nuclear attack, and all abandoned focus on such measures. India faces, overtime, a challenging nuclearised environment in the neighbourhood. It seeks to protect itself against the possibility of use of nuclear weapons by an effective deterrent strategy. Civil defence measures for a population of India’s size appear unfeasible without expending a large amount of financial resources, a commodity in short supply at the best of times. India must focus its energies on buttressing the credibility of its nuclear deterrent. It is imperative that we make a nuclear attack on our nation less attractive by assuring that we are capable of avenging any possible nuclear attack, thereby removing any incentive for such an attack by the adversary.

INDIA-JAPAN CIVIL NUCLEAR COOPERATION: THE JOURNEY AND ITS FUTURE

PIYUSH GHASIYA

INTRODUCTION

On November 11, 2016, Indian Prime Minister (PM) Narendra Modi and his Japanese counterpart Shinzo Abe signed the India-Japan civil nuclear cooperation agreement in Tokyo. Eight months after the signing of the deal, on July 20, 2017, the civil nuclear cooperation agreement came into force. This agreement was historic as India became the first nuclear Non-Proliferation Treaty (NPT) non signatory state to sign such an agreement with Japan. This agreement with Japan not only promises to help India in getting advanced Japanese nuclear power technology but also increases India's stature as a responsible nuclear power state. The talks on India-Japan civil nuclear cooperation were initiated under the leadership of former PM Manmohan Singh in 2010. However, the 2011 Fukushima nuclear disaster and India's non-NPT status created roadblocks for the talks to move further quickly. Finally, after seven long years and numerous discussions, the agreement was signed. Japan became the 14th country to sign such an agreement with India. The other nations include the US, South Korea, Russia, France, Mongolia, Vietnam, the Czech Republic, Britain, Argentina, Namibia, Australia, Kazakhstan, and Canada.

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As a developing nation with a huge electricity demand, India is exploring energy resources other than traditional ones such as oil and natural gas. Nuclear energy is going to be crucial to fulfil India's growing energy needs.

Japan, the only country to have suffered from the devastation of atomic bombs, has been a staunch opponent of the proliferation of nuclear weapons. However, early on, it had begun to focus on the civilian use of atomic energy. Japan is one of the advanced nations in nuclear technology and power generation. India too has established its nuclear power programme through indigenous efforts, since, till recently, it was treated as an outcast in the nuclear arena because of its opposition to signing the NPT, Comprehensive Test Ban Treaty (CTBT) and other such nuclear-related treaties. As a developing nation with a huge electricity demand, India is exploring energy resources other than traditional ones such as oil and natural gas. Nuclear energy is going to be crucial to fulfil India's growing energy needs.

Though India and Japan have similar views on the non-proliferation of atomic weapons, and the use of atomic energy for peaceful or civilian purposes, both, nevertheless, remained constrained by circumstances and on opposite sides of the issue for a long time. From that point of view, the coming together of India and Japan for the civil nuclear agreement shows the increased trust factor between the two. In this context, studying the India-Japan civil nuclear cooperation is essential. While charting the journey of both nations in the civilian usage of nuclear power, and their stand on the issue of nuclear disarmament, this article will try to understand India-Japan civil nuclear cooperation. It also identifies the challenges for both nations that must be overcome to make this agreement a success.

WHAT KEPT INDIA AND JAPAN APART

Positions on NPT and Non-Proliferation

Japan's position on the nuclear issue has been impacted by the dropping of atomic bombs on its cities of Hiroshima and Nagasaki on August 6 and 9,

1945. On August 6, 1945, the US bomber B-29, the Enola Gay, dropped the atomic bomb known as "Little Boy." It immediately killed 80,000 people, and another 60,000 people who suffered injuries and radiation exposure, died by 1950.¹ After three days, on August 9, 1945, the bomber B-29, Bock's Car dropped "Fat Man," which killed between 60,000 to 80,000 people.² "Fat Man" was equivalent to 22 kilotons (KT) of TNT whereas "Little Boy" to 12.5 KT of TNT.

Because of these bombings, Japan became a staunch opponent of the nuclear weapons programme and never developed nuclear weapons of its own. When the NPT came into existence, Japan became its biggest supporter.

The world had never witnessed destruction on such a large scale. Japan succumbed to the devastation, and on August 15, 1945, Japanese Emperor Akihito announced Japan's unconditional surrender on a radio address to the nation wherein he mentioned the atomic bomb as "a new and most cruel bomb."³ Because of these bombings, Japan became a staunch opponent of the nuclear weapons programme and never developed nuclear weapons of its own. When the NPT came into existence, Japan became its biggest supporter. Japan's nuclear disarmament and non-proliferation policy has four pillars⁴:

- The Atomic Energy Basic Law of 1955.
- The "Three Non-Nuclear Principles" which the Japanese Diet adopted in 1968.
- Japan's compliance with the NPT.
- Japan's reliance on the US for extended nuclear deterrence.

The Atomic Energy Basic Law of 1955

The Atomic Energy Basic Law of 1955 (AEBL-1955) is Japan's basic

1. "Hiroshima: Before and After the Atomic Bombing," *The Atlantic*, May 12, 2016, <https://www.theatlantic.com/photo/2016/05/hiroshima-before-and-after-the-atomic-bombing/482526/>. Accessed on December 4, 2017.
2. "Atomic Bomb Dropped on Nagasaki," *History*, 2009, <http://www.history.com/this-day-in-history/atomic-bomb-dropped-on-nagasaki>. Accessed on December 4, 2017.
3. Ibid.
4. "Japan," *NTI*, February 2017, <http://www.nti.org/learn/countries/japan/nuclear/>. Accessed on October 31, 2017.

legislative framework to govern its nuclear energy sector. AEBL-1955 was passed on December 19, 1955, and has 21 Articles. Article 1 defines the objective of this law as “to secure resources in the future, achieve scientific and technological progress, and promote industry by encouraging the research, development and utilization of nuclear energy, thereby contributing to the improvement of the welfare of human society and of the national living standard.”⁵

Article 2 defines the basic policy thus: “The research, development and utilization of nuclear energy shall be performed independently under a democratic administration, and the results obtained shall be made public so as to actively contribute to international cooperation.”⁶

Other Articles include those on development and acquisition of minerals, control over nuclear fuel materials, compensation, protection from radiation hazards, control over reactors, development of atomic energy, development of institutions and other atomic energy-related issues.

In 2012, the Japanese Diet amended Article 2 of this law and included the words “national security.” It now reads, “The safe use of atomic power is aimed at contributing to the protection of the people’s lives, health and property, environmental conservation and national security.” This amendment stirred up a controversy as some sections felt that the language could be used as a legal basis for Japan to have a nuclear weapons programme in the future.⁷ Also, voices from different sections claimed that the new amendment was not in harmony with the “Three Non-Nuclear Principles.”

Three Non-Nuclear Principles

On December 11, 1967, Japanese PM Eisaku Sato gave a speech at the Budget Committee in the House of Representatives. In that speech, he stated,

5. “Atomic Energy Basic Act,” *Japanese Law Translation*, December 19, 1955, http://www.japaneselawtranslation.go.jp/law/detail_download/?ff=09&id=2233. Accessed on October 31, 2017.

6. *Ibid.*

7. Dan Joyner, “Japan’s Nuclear Law and National Security,” *Arms Control Law*, July 24, 2012, <https://armscontrolaw.com/2012/07/24/japans-nuclear-law-and-national-security/>. Accessed on October 31, 2017.

*My responsibility is to achieve and maintain safety in Japan under the Three Non-Nuclear Principles of not possessing, not producing, and not permitting the introduction of nuclear weapons, in line with Japan's Peace Constitution.*⁸

Almost 50 years have passed since that speech, and Japan has stood by those principles. However, recently, with the growing threat from North Korea, there have been concerns that the last part, “not permitting the introduction of nuclear weapons” bears reconsideration. In 2009, a retired administrative vice-minister of foreign affairs alleged that there is a secret paper which is an agreement between the US and Japan, allowing the US to introduce its nuclear weapons into Japanese territory without any advance permission.⁹ These allegations were confirmed when, in 2010, Japanese Foreign Minister Katsuya Okada announced the existence of secret Cold War-era agreements of such nature.¹⁰ In September 2017, amidst the high point of the North Korean missile crisis, Japan's ruling Liberal Democratic Party's (LDP's) former Secretary-General Shigeru Ishiba, raised the issue again when he called for deliberations on a review of Japan's “Three Non-Nuclear Principles.” He said, “Is it right to refuse the deployment of nuclear weapons inside the country while relying on the US arms for protection?”¹¹ Such statements show that Japan under the current leadership is open to discussing the future possibilities of changing those principles. However, it remains an incipient debate at the moment.

The Nuclear Non-Proliferation Treaty (NPT)

The NPT opened for signature on July 1, 1968, and entered into force on March 5, 1970. In February 1970, Japan signed the NPT and ratified it in June 1976. Since then, Japan has been a proponent of nuclear non-proliferation

8. MOFA, “Three Non-Nuclear Principles,” MOFA, December 11, 1967, <http://www.mofa.go.jp/policy/un/disarmament/nnp/>. Accessed on October 31, 2017.

9. Tomoko Kiyota, “Japan's Non-Nuclear Principles: Change in the Offing?” *IPCS*, August 17, 2009, <http://www.ipcs.org/article/nuclear/japans-non-nuclear-principles-change-in-the-offing-2948.html>. Accessed on October 31, 2017.

10. Anthony Kuhn, “Japan Confirms Secret Nuclear Pacts With US,” *NPR*, March 11, 2010, <http://www.npr.org/templates/story/story.php?storyId=124567404>. Accessed on October 31, 2017.

11. “Japan Must Stick to Non-Nuclear Principles,” *The Mainichi*, September 9, 2017, <https://mainichi.jp/english/articles/20170909/p2a/00m/0na/009000c>. Accessed on October 31, 2017.

Japan has been a proponent of nuclear non-proliferation and a world free of nuclear weapons. However, its support for nuclear non-proliferation is overshadowed by the fact that it is under the US nuclear umbrella. This brings it into conflict with complete support for universal nuclear disarmament despite its abhorrence for nuclear weapons.

and a world free of nuclear weapons. However, its support for nuclear non-proliferation is overshadowed by the fact that it is under the US nuclear umbrella. This brings it into conflict with complete support for universal nuclear disarmament despite its abhorrence for nuclear weapons. The dilemma was played out recently in the context of the New Nuclear Weapon Prohibition Treaty (NWPT).

On the historic day of July 7, 2017, 122 nations of the world voted for the NWPT at the United Nations General Assembly. This treaty bans the acquisition, development, production, manufacture, possession, transfer, receipt, testing, extra-territorial stationing, use, and threat of use, of nuclear weapons.¹² Japan, along with other countries such as Australia, India, Canada, and Norway decided to remain out of the NWPT. Many nations that see Japan as a significant force in the anti-nuclear movement felt betrayed by this move of Japan. Moreover, this move came at a time when the International Atomic Energy Agency (IAEA) and the UN High Representative for Disarmament Affairs—the two highest international bodies in the sector—are both headed by Japanese.

In an opposite move and one in line with Japan's earlier stance on the anti-nuclear movement, Japan circulated a draft UN resolution titled "United Action with the Renewed Determination Towards the Total Elimination of Nuclear Weapons." This draft was adopted by the First Committee of the UN General Assembly on October 28, 2017, with the

12. Ramesh Thakur, "Japan on the Wrong Side of Nuclear Weapons Ban Treaty," *The Japan Times*, July 10, 2017, <https://www.japantimes.co.jp/opinion/2017/07/10/commentary/japan-commentary/japan-wrong-side-nuclear-weapons-ban-treaty/#.Wfk8j2iCwnk>. Accessed on November 1, 2017.

support of 144 countries including 77 co-sponsor countries.¹³ Japan has been forwarding a similar resolution for the past 24 years and has gained more and more sponsors. However, compared to last year, this year, the support was less. Last year, it was backed by 167 countries, with 109 countries as co-sponsors. One reason for the decline in the numbers of supporting countries was the language of the draft, for example, the phrase “nuclear weapons use” rather than “any use of nuclear weapons”, and “to fully implement the Treaty on the Non-Proliferation of Nuclear Weapons” rather than “to accomplish the total elimination of their nuclear arsenals.” Moreover, there is no reference or mention in it of the new NWPT.^{14 15}

The North Korean nuclear and missile programme is a huge security issue for Japan. In 2017, the North Koreans fired 23 missiles during 16 tests. With each test, North Korean missile technology is improving.

The North Korean nuclear and missile programme is a huge security issue for Japan. In 2017, the North Koreans fired 23 missiles during 16 tests. With each test, North Korean missile technology is improving. On December 4, 2017, the Japanese Parliament declared North Korea’s missile tests an “imminent threat” to Japan. Japanese PM Shinzo Abe said that talking to the reclusive state was meaningless.¹⁶ Amidst this crisis and the growing nuclear threat from North Korea, some Japanese political sections are suggesting that Japan should acquire nuclear weapons for effective deterrence. Though not much progress has been made in this

13. MOFA, “The Adoption of the Draft Resolution on Nuclear Disarmament Submitted by Japan to the First Committee of the United Nations General Assembly”, MOFA, October 28, 2017, http://www.mofa.go.jp/press/release/press4e_001771.html. Accessed on November 1, 2017.

14. “Fewer Endorse Japan’s 24th Anti-Nuclear Resolution at UN after Disarmament Tweak,” *The Japan Times*, October 28, 2017, <https://www.japantimes.co.jp/news/2017/10/28/national/politics-diplomacy/although-passed-u-n-vote-fewer-nations-endorsed-japans-anti-nuclear-resolution/#.WfBdGiCwnk>. Accessed on November 1, 2017.

15. “Japan’s Weakened UN Draft Resolution on Nukes Erodes Trust,” *The Mainichi*, October 17, 2017, <https://mainichi.jp/english/articles/20171017/p2a/00m/0na/004000c>. Accessed on November 1, 2017.

16. “North Korea Missile Tests are ‘Imminent Threat’: Japan,” *Channel News Asia*, December 4, 2017, <http://www.channelnewsasia.com/news/asiapacific/north-korea-missile-tests-are-imminent-threat-japan-9466948>. Accessed on December 4, 2017.

direction, the shifting attitude and Japan's focus more towards security rather than total elimination of nuclear weapons is understandable. However, the negative impact of this decision includes a decline in trust, a backlash from the Japanese people and a dent in Japan's standing in the anti-nuclear movement. These issues can harm Japan's national interests in the long run.

India's Position on the NPT

India's commitment to non-proliferation goes back to 1954 when Nehru proposed an end to nuclear testing in 1954. India signed the Partial Test Ban Treaty (PTBT) in 1963.¹⁷ India was also part of the 18-nation Disarmament Committee (ENDC) which was convened in July 1965 in Italy to negotiate the NPT. There, the 8 non-aligned states stated that they would support an NPT only if "it takes to halt the nuclear arms race and to limit, reduce, and eliminate stocks of nuclear weapons and their means of delivery."¹⁸ However, India was upset when in 1967, the NPT came into existence, and it recognised the countries that had exploded a nuclear device prior to January 1, 1967, as Nuclear Weapon States (NWS). Since then, India has rejected the NPT on the ground that it perpetuates an unjust distinction between the five nuclear states possessing nuclear weapons while requiring all other states party to the treaty to remain non-nuclear. To satisfy the concerns of the Non-Nuclear Weapons States (NNWS), the treaty incorporated Article VI which states,

Each of the Parties to the Treaty undertakes to pursue negotiations in good faith on effective measures relating to cessation of the nuclear arms race at an early date and to nuclear disarmament, and on a treaty on general and complete disarmament under strict and effective international control.¹⁹

17. Leonard Weiss, "India and the NPT," *Strategic Analysis*, 2010, pp.255-271.

18. *Ibid.*

19. Christopher A Ford, "Debating Disarmament: Interpreting Article VI of the Treaty on the Non-Proliferation of Nuclear Weapons," *Nonproliferation*, November 2007, <https://www.nonproliferation.org/wp-content/uploads/npr/143ford.pdf>. Accessed on November 6, 2017.

However, India is highly critical of the pace of the nuclear weapon states' disarmament progress and claims that they have not fulfilled their obligations under Article VI.²⁰

The efforts of Homi Bhabha and other scientists came to fruition in 1974 when India conducted a Peaceful Nuclear Explosion (PNE) codenamed "Smiling Buddha." The reactions to this were mixed, as France sent a congratulatory message and the US issued a message that was neither condemnatory nor congratulatory. However, the arms controllers in the US introduced Bills to tighten nuclear export controls under the Atomic Energy Act in the 94th Congress.

The creation of an elite club of 48 supplier states known as the Nuclear Suppliers Group (NSG) in 1975 was the result of India's PNE in 1974. The NSG guidelines aspire to ensure that nuclear trade for peaceful purposes does not contribute to the proliferation of nuclear weapons while not hindering international trade and cooperation in the nuclear field.²¹ For 30 years, India-US nuclear technology transfers were stopped. But India's stance regarding disarmament remained the same.

India was aware of the fact that the Clinton Administration was planning to change the status of the NPT, and during the NPT Review and Extension Conference (NPTREC) of 1995, the Clinton Administration decided to extend the treaty for an indefinite period. The NWS agreed in a formal statement "to pursue 'systematic and progressive efforts to reduce nuclear weapons globally, with the ultimate goal of eliminating those weapons'."²² This statement manifested in the form of the Comprehensive Test Ban Treaty (CTBT). Though India had co-sponsored the 1993 resolution for negotiations for the CTBT, it now opposed it. The reason for opposing the CTBT was that this treaty aimed to prevent all countries from conducting nuclear tests, thus, India faced the prospect of two nuclear-armed adversaries such as Pakistan

20. n.4.

21. "Nuclear Suppliers Group (NSG)," *NTI*, September 25, 2017, <http://www.nti.org/learn/treaties-and-regimes/nuclear-suppliers-group-nsg/>. Accessed on November 7, 2017.

22. "Principles and Objectives for Nuclear Non-Proliferation and Disarmament," *FAS*, December 9, 1996, https://fas.org/nuke/control/npt/text/prin_obj.htm. Accessed on November 7, 2017.

Japan's non-nuclear policy is an embodiment of the anti-nuclear weapons sentiment of the Japanese people and not simply a product of the US' nuclear umbrella.

and China.²³ Moreover, the CTBT did not include a timetable for nuclear disarmament as proposed by Rajiv Gandhi in 1988.²⁴

In May 1998, India conducted a series of nuclear tests known as "Operation Shakti: 1998." Unlike the test of 1974, Operation Shakti was of a military nature. Brajesh Mishra, principal secretary to PM Atal Bihari Vajpayee, told reporters, "These tests have established that India has a proven capability for a weaponised nuclear program."²⁵ With these tests, India became a *de-facto* nuclear weapon state. The US put economic sanctions on India, but other nations refrained from doing this. However, the 9/11 terrorist attacks on the US made it change its approach towards India: it removed the sanctions from India, and is now open to engaging with India in the field of nuclear energy.

COLD WAR ALLIANCES

Japan and the US' Extended Nuclear Deterrence

US military forces were using bases in Japan for combat operations, and there were talks about deploying nuclear arms on those bases during the Vietnam War. These developments triggered fears among the Japanese that the presence of nuclear weapons in Japan would expose it to attacks. That led to the enactment of the "Three Non-Nuclear Principles." by Japanese PM Sato Eisaku in 1967. Since then, Japan has been banking on the US nuclear umbrella for extended deterrence.²⁶ Yukio Satoh, the vice-chairman of the Japan Institute of International Affairs (JIIA) stated that the nuclear umbrella has contributed to the goal of nuclear non-proliferation. Moreover,

23. Dhruva Jaishankar, "Decoding India's Nuclear Status," *The Wire*, April 3, 2017, <https://thewire.in/120800/decoding-india-nuclear-status/>. Accessed on November 7, 2017.

24. Leonard Weiss, "India and the NPT," *Strategic Analysis*, 2010, pp.255-271.

25. "Operation Shakti: 1998," *Nuclear Weapon Archive*, March 30, 2001, <http://nuclearweaponarchive.org/India/IndiaShakti.html>. Accessed on November 7, 2017.

26. Beina Xu, "The US-Japan Security Alliance," *CFR*, July 1, 2014, <https://www.cfr.org/backgrounder/us-japan-security-alliance>. Accessed on November 2, 2017.

he also affirmed that Japan's non-nuclear policy is an embodiment of the anti-nuclear weapons sentiment of the Japanese people and not simply a product of the US' nuclear umbrella.²⁷

However, since 1993, when North Korea launched a Nodong missile and withdrew from the NPT to start developing its nuclear weapons materials, the question about the effectiveness of the extended nuclear deterrence has been raised many times. If we see the issue from the perspective of a nuclear attack, then we can say that the extended nuclear deterrence has been successful, but its efficacy is in question when it comes to deterring other provocations or low-intensity conflict.²⁸ On top of that, the remarks by President Donald Trump during his campaign about Japan paying more for the security assurance by the US and acquiring nuclear weapons, raised concerns among the Japanese regarding the future of the American nuclear umbrella.²⁹

After India got independence, it wanted to attain its rightful and respected position in the international horizon.

India felt that taking sides or joining camps during the Cold War would prove costly to its independence and would lead to a new form of imperialism.

India and Non-Alignment Movement (NAM)

After India got independence, it wanted to attain its rightful and respected position in the international arena. India felt that taking sides or joining camps during the Cold War would prove costly to its independence and would lead to a new form of imperialism. With that thought in mind, India decided not to join either of the two blocs in the interest of its economic

27. Yukio Satoh, "US Extended Deterrence and Japan's Security," Centre for Global Security Research (CGSR). 2017, <https://cgsr.llnl.gov/content/assets/docs/satoh-report-final.pdf>. Accessed January 30, 2018.

28. Van Jackson, "Raindrops Keep Falling on my Nuclear Umbrella," *Foreign Policy*, May 18, 2015, <http://foreignpolicy.com/2015/05/18/raindrops-keep-falling-on-my-nuclear-umbrella-us-japan-south-north-korea/>. Accessed on November 2, 2017.

29. Tetsuo Kotani, "The Future of Alliances and Extended Nuclear Deterrence," *CSIS*, February 1, 2017, https://csis-prod.s3.amazonaws.com/s3fs-public/event/170201_Future_Alliance_Extended_Nuclear_Deterrence_panel_2.pdf?5JgM6V0pORC2lbNKVRtBJx35X0yafW_X. Accessed on November 2, 2017.

development, to maintain an independent judgment in evaluating and deciding about foreign affairs, and following an independent foreign policy, to safeguard its interests and promote international peace.

The newly emerged independent countries had formed the third force called the non-aligned group, and India was the leader of that group. Most of the colonial countries that achieved their independence by 1963 became active members of the Non-Aligned Movement (NAM). The NAM countries were in a position to mobilise world public opinion on various international issues in their favour. This made it difficult for the superpowers to go against the interests of the non-aligned countries.³⁰

India's non-aligned position and Japan embracing the US bloc also comprised a major reason for the low interaction between India and Japan during the Cold War.

Japan's Criticism of India's Nuclear Tests

On May 18, 1974, when India conducted its peaceful nuclear explosion under the name "Smiling Buddha" (also known as Pokhran-I), Japan was very upset and imposed sanctions on India. However, as mentioned above, Japan's aid to India comprised a small amount, and Japan itself was in the debating stage about the ratification of the nuclear NPT. When India was facing a balance of payment crisis in 1991, Japan offered a soft loan of \$150 million and further committed \$350 million.³¹

Japan was one of the first countries to condemn India's nuclear test at Pokhran in 1998. In a press release on May 14, 1998, the chief Cabinet Secretary talked about the measures undertaken by Japan.³² In the 1990s, Japan was the top donor to India, having committed Yen 133 billion in loans, Yen 3.5 billion in grant assistance and technical support in addition to this

30. "India's Foreign Policy: An Historical Perspective," 2008, http://shodhganga.inflibnet.ac.in/bitstream/10603/95278/8/08_chapter%202.pdf. Accessed on January 23, 2018.

31. A.K. Bhattacharya, "Two Months that Changed India," *Business Standard*, July 2, 2011, http://www.business-standard.com/article/beyond-business/two-months-that-changed-india-111070200041_1.html. Accessed May 22, 2017.

32. MOFA, "Comments by Chief Cabinet Secretary on Measures in Response to the Second Nuclear Testing conducted by India," MOFA, May 14, 1998, <http://www.mofa.go.jp/announce/announce/1998/5/0312-09.html>. Accessed on May 22, 2017.

(accounting for half of India's foreign aid).³³ Following India's nuclear test, Japan imposed sanctions on India and stopped new loans. However, India was still receiving aid for ongoing projects, humanitarian aid, and grant assistance for grassroots projects.

WHAT IS BRINGING INDIA AND JAPAN TOGETHER TODAY?

India-US Nuclear Deal

The new phase of development in the Indian nuclear industry came after the India-US civil nuclear deal. The process of the India-US civil nuclear agreement started in July 2005, and it took more than three years for the deal to come to fruition as it had to pass through several complex stages. With this, India agreed to separate its civil and military nuclear facilities and placed its civilian nuclear reactors under the inspection of the International Atomic Energy Agency (IAEA). The process included a civil-military separation plan in India, amendment of the US domestic law, especially the Atomic Energy Act of 1954, an India-IAEA safeguards (inspection) agreement and the grant of an exemption for India by the NSG. Moreover, the deal promises to allow India access to the international uranium market; this will enable India to purchase the uranium it needs to fuel those reactors it chooses to put under IAEA safeguards.³⁴

The India-US civil nuclear agreement opened the gates for India to the international nuclear community, which were closed when India conducted its PNE in 1974. However, critics point out that even after almost ten years, India has not bought a single US nuclear power reactor. But the success of the deal can be gauged from the fact that after this deal, India was able to sign similar agreements with more than 12 countries such as Japan, Russia, France, Britain, and Canada. This kind of engagement would have been impossible without the India-US civil nuclear agreement.

33. MOFA, "Press Conference by the Press Secretary 12 May, 1998," MOFA, May 12, 1998, <http://www.mofa.go.jp/announce/press/1998/5/512.html#1>. Accessed on May 23, 2017.

34. Rameez Raja, "India's Quest for Power and Status: A Study of India's Nuclear Policy," *IOSR Journal of Humanities and Social Sciences*, 2016, pp.1-10.

On March 11, 2011, the great East Japan earthquake, and tsunami, which caused the catastrophic nuclear calamity at the Fukushima Dai-ichi Nuclear Power Station put a full stop on Japan's nuclear power future. Though no one died due to the Fukushima nuclear disaster, it once again proved the destructive nature of nuclear power.

Nuclear Industry/Market

In 2011, Japan had 54 nuclear power reactors in operation across the country (after the US and France, Japan has the 3rd largest number of nuclear plants in the world). Japan, with a generation capacity of 48,847 Mega Watt (MW) was also the 3rd largest nuclear power producer after the US and France. Nuclear power comprised over 30 percent of the country's total electricity production and this was planned to increase to 40 percent and 50 percent by 2017 and 2030 respectively.³⁵

However, on March 11, 2011, the great East Japan earthquake, and tsunami, which caused the catastrophic nuclear calamity at the Fukushima Dai-ichi Nuclear Power Station put a full stop on Japan's nuclear power future. Though no one died due to the Fukushima nuclear disaster, it once again proved the destructive nature of nuclear power. The Japanese government shut down all the 50 intact power reactors, one by one. In 2012, the incumbent Japanese PM Yoshihiko Noda announced that the government would try to phase out all nuclear power by 2040 when the existing plants will reach their 40-year licensed operating lives.³⁶ In September 2012, the Japanese government established the new nuclear regulatory agency, the "Nuclear Regulation Authority" (NRA). This new regulatory body is different from the old nuclear safety agency, the "Nuclear and Industrial Safety Agency" not only in name but also in affiliation. Whereas the older version was under the Ministry of Economy, Trade, and Industry (METI), the new regulatory body is under the Environment Ministry. The interesting facet of this change is that the earlier agency was under the ministry which was promoting nuclear

35. "Japan," *NTI*, February 2017, <http://www.nti.org/learn/countries/japan/nuclear/>. Accessed on November 2, 2017.

36. Tatsujiro Suzuki, "Six Years After Fukushima, Much of Japan has Lost Faith in Nuclear Power," *The Conversation*, March 10, 2017, <https://theconversation.com/six-years-after-fukushima-much-of-japan-has-lost-faith-in-nuclear-power-73042>. Accessed on November 2, 2017.

power. However, as this time the focus is on the safety and regulatory measures, it has been assigned under the Environment Ministry.

However, Shinzo Abe, a pro-nuclear leader came into power at the end of 2012. In 2014, the government adopted the 4th Basic Energy Plan, proposed by METI. This plan termed nuclear power as “an important base-load power source as a low carbon and quasi-domestic energy source.” The NRA is responsible for the regulatory requirements which are of the most stringent level in the world, and if the NRA finds the nuclear power plants up to the mark, then only will the government go ahead with them.³⁷

In 2016, the Otsu district court in Shiga prefecture, under which lies the Takahama plant, ordered the shutdown of two nuclear reactors that were previously declared safe under the post-disaster safety rule. On this decision, Shinzo Abe stated in a press conference that a resource-poor country like Japan cannot do without nuclear power to secure its energy supply.³⁸

The Current Status of Nuclear Power in Japan

As of now, five out of 54 nuclear power reactors are back online, and the applications of 21 reactors are under review. Nuclear power is providing 1.7 percent of Japan’s electricity which is way below from the 30 percent before the 2011 disaster.³⁹ METI, which is in charge of the national energy policy, published a long-term plan in 2015 and suggested that the share of nuclear power would be 20-22 percent in the total energy mix [22-24 percent

As of now, five out of 54 nuclear power reactors are back online, and the applications of 21 reactors are under review. Nuclear power is providing 1.7 percent of Japan’s electricity which is way below from the 30 percent before the 2011 disaster.

37. “Strategic Energy Plan,” METI, April 2014, http://www.enecho.meti.go.jp/en/category/others/basic_plan/pdf/4th_strategic_energy_plan.pdf. Accessed on November 3, 2017.

38. “Shinzo Abe says Japan ‘Cannot do Without’ Nuclear Power, on eve of Fukushima Disaster,” SCMP, March 11, 2016, <http://www.scmp.com/news/asia/east-asia/article/1922953/shinzo-abe-says-japan-cannot-do-without-nuclear-power-eve>. Accessed on November 2, 2017.

39. Ken Silverstein, “Japan Circling Back To Nuclear Power After Fukushima Disaster,” *Forbes*, September 8, 2017, <https://www.forbes.com/sites/kensilverstein/2017/09/08/japan-may-be-coming-full-circle-after-its-fukushima-nuclear-energy-disaster/#2f0c4b5d30e8>. Accessed on November 3, 2017.

of renewable energy, 26 percent of coal, 27 percent of Liquefied Natural Gas (LNG), and 3 percent of oil] by 2030.⁴⁰ The Greenpeace nuclear spokesperson Shaun Burnie has called this plan unrealistic: "The reality is, they will, by no means, get to that 20 or 22 percent. I think inside the government, some factions essentially believe that may be they can achieve that target, but a more realistic appraisal says may be it will be a lot less."⁴¹ Moreover, the growing public distrust is also proving to be a severe challenge for the policy-makers and the nuclear industry. A poll by the Japan Atomic Energy Relations Organisation (a pro-nuclear body) in 2015 showed that 47.9 percent want nuclear energy to be abolished gradually and 14.8 percent said that it should be abolished immediately. Another survey by *Asahi Shimbun* in 2016 was even more negative as 57 percent respondents opposed restarting the plant.⁴² With all these factors, the future of nuclear energy in Japan is bleak.

The Current Status of Nuclear Power in India

The construction of India's first nuclear power plant comprising two nuclear reactors began in 1964 at Tarapur, Maharashtra, and it became operational in 1969. General Electric, USA, built these reactors. With that, India became the first country in Asia to have an operating nuclear power plant in the year 1969. The first unit of India's second nuclear power plant came up in Rajasthan in 1972, which was developed with the assistance of Canada's Atomic Energy Canada Limited (AECL) in collaboration with the Nuclear Power Corporation of India Ltd (NPCIL). In 1970, the NPT came into effect,

40. "Plan Sets out Japan's Energy Mix for 2030," *World Nuclear News*, June 3, 2015, <http://www.world-nuclear-news.org/NP-Plan-sets-out-Japans-energy-mix-for-2030-0306154.html>. Accessed on November 3, 2017.

41. Rachel Mealey, "The Future of Nuclear Energy in Japan, Nearly Six Years after the 2011 Fukushima Disaster," *ABC*, January 5, 2017, <http://www.abc.net.au/news/2017-01-05/the-future-of-nuclear-energy-in-japan-after-fukushima/8162686>. Accessed on November 3, 2017.

42. JNFL, "Rokkasho Reprocessing Plant," *Stanford*, 2017, <http://large.stanford.edu/courses/2017/ph241/solitario2/docs/jnfl.pdf>. Accessed on November 3, 2017; n.4; Ken Silverstein, "Japan Circling Back To Nuclear Power After Fukushima Disaster," *Forbes*, September 8, 2017, <https://www.forbes.com/sites/kensilverstein/2017/09/08/japan-may-be-coming-full-circle-after-its-fukushima-nuclear-energy-disaster/#2f0c4b5d30e8>. Accessed on November 3, 2017; "Plan Sets Out Japan's Energy Mix for 2030," *World Nuclear News*, June 3, 2015, <http://www.world-nuclear-news.org/NP-Plan-sets-out-Japans-energy-mix-for-2030-0306154.html>. Accessed on November 3, 2017; Mealey, n.41; Suzuki, n.36.

and this was the reason why India's civil nuclear strategy, from its inception, has been aimed at complete independence in the nuclear fuel cycle. Keeping these limitations in mind, India conceived a three-stage programme wherein the spent fuel from stage one is reprocessed to produce fuel for the second stage, and from the second to the third stage. This three-stage programme not only increases the energy potential of the fuel multiple times but also reduces the quantity of waste generated.⁴³

The responsibility for the design, construction, commissioning, and operation of thermal nuclear power plants has been given to NPCIL, a government-owned company. The Atomic Energy Act (AEA) of 1962 prohibits private control of nuclear power generation. The 2016 amendment in the AEA 1962 allows joint ventures among the public sector companies and the involvement of private companies is limited to the supply chain.⁴⁴

Presently, India has 22 operational nuclear power reactors distributed in six states. Total nuclear power capacity is 6,780 MW, and, recently, India embarked on a plan to expand it by 7,000 MW more, increasing the total capacity to 14,000 MW, by 2024. Ten nuclear power reactors, each with 700 MW capacity will be built with indigenously manufactured equipment.⁴⁵ Regarding power generation, in 2014-15, nuclear power contributed just under 3 percent in total power generation. With the plan to increase the nuclear capacity, India is aiming to supply 25 percent of electricity from nuclear power by 2050.⁴⁶ With this ambition, it is necessary to have nuclear cooperation with other countries. Till now, India has signed a civil nuclear deal with as many as 12 states.⁴⁷

43. S.K. Jain, "Nuclear Power: An Alternative," NPCIL, <http://www.npcil.nic.in/pdf/nuclear%20power-%20an%20alternative.pdf>. Accessed on November 9, 2017.

44. "Nuclear Power in India," *World-Nuclear*, October 2017, <http://www.world-nuclear.org/information-library/country-profiles/countries-g-n/india.aspx>. Accessed on November 9, 2017.

45. "India to Add 7,000 MW Nuclear Power Capacity: Power Minister Piyush Goyal," *The Economic Times*, August 12, 2017, <https://economictimes.indiatimes.com/industry/energy/power/india-to-add-7000-mw-nuclear-power-capacity-power-minister-piyush-goyal/articleshow/60034058.cms>. Accessed on November 14, 2017.

46. n.44.

47. "Important Agreements," *DAE*, November 30, 2017, <http://www.dae.nic.in/?q=node/75>. Accessed on December 4, 2017.

Japan's relationship with China has been going through a low for the past several years owing to the territorial dispute in the East China Sea. China's military modernisation, especially in the maritime domain, and its cyber attacks, and defence posture in the South China Sea, also concern Japan.

Geopolitics

Geopolitics is playing a significant role in bringing India and Japan closer and the India-Japan civil nuclear agreement is witness to that closeness. Because of this reason, it becomes important to study the equations of India and Japan with key players in international affairs such as the US and China.

Japan's Relations with the US and China

US President Donald Trump emphasised during his campaign that his foreign policy on Asia would be different from that of his predecessor Barack Obama. As soon as he was elected as the president of the US, he pulled out from the negotiations for a 12-country Trans-Pacific Partnership—a partnership that most economists think would make all parties richer.⁴⁸ Another issue that Mr. Trump is vocal about is the 'nuclear umbrella' to the US' Asian allies such as South Korea and Japan. Trump has suggested that the US should allow South Korea and Japan to go nuclear rather than continue to rely on the American security guarantees, arguing that these allies gain a competitive economic advantage by shifting their defence burdens onto the US.⁴⁹ In an article in *Forbes*, Doug Bandow has calculated that Japan, with a GDP of \$4.6 trillion, should pay 4 percent (around \$184 billion) to the US for the nuclear umbrella, minimal military outlays, standard defence, and a combination of economic international involvement

48. "How Donald Trump Weakens America's Influence in Asia," *The Economist*, August 31, 2017, <https://www.economist.com/news/asia/21727944-nonetheless-american-led-asian-order-will-probably-survive-how-donald-trump-weakens-americas>. Accessed on September 20, 2017.

49. Abraham Newman, and Daniel Nexon, "Trump says American Allies Should Spend More on Defense. Here's Why he's Wrong," *VOX*, February 16, 2017, <https://www.vox.com/the-big-idea/2017/2/16/14635204/burden-sharing-allies-nato-trump>. Accessed on September 20, 2017.

and limited potential conflict.⁵⁰ Moreover, the recent missile test by North Korea (two went over the Northern Japanese island of Hokkaido) created uneasiness among the Japanese people. Additionally, Japan also fears that the exchange of provocative and escalatory language between US President Trump and North Korean leader Kim Jong-un can precipitate an attack on Japan.

Japan's relationship with China has been going through a low for the past several years owing to the territorial dispute in the East China Sea. China's military modernisation, especially in the maritime domain, and its cyber attacks, and defence posture in the South China Sea, also concern Japan. Furthermore, China's refusal to condemn North Korea over the recent missile launch has further strained Japan-China relations. Rather than criticising North Korea, China's Foreign Ministry spokesperson Hua Chunying suggested that other parties such as the US, South Korea, and Japan had prompted "the vicious cycle of endless nuclear tests, missile launches, and military drills." Hua demanded that they should be responsible and called on all parties to exercise restraint and remain cool-headed.⁵¹

Long-pending issues between India and China remain intact. The problems also arise from China's naval expansion under the 'string of pearls' strategy, and, primarily with its increased presence in the Indian Ocean Region (IOR), are a cause of concern for India.

India's Relations with the US and China

In June 2017, India and China had the Doklam standoff which brought the two countries to the brink of war. The standoff continued for more than two months and on August 28, both countries announced withdrawal of troops. However, in January 2018, satellite images showed that China is

50. Doug Bandow, "Donald Trump Has The Right Idea: If America Is Going To Defend The World, Rich Allies Should Pay Up," *Forbes*, September 30, 2015, <https://www.forbes.com/sites/dougbandow/2015/09/30/make-rich-allies-pay-if-america-is-going-to-defend-the-world-donald-trump-got-one-idea-right/#1e3105d63073>. Accessed on September 20, 2017.

51. Charlotte Gao, "China Refuses to Condemn North Korea's New Missile Launch," *The Diplomat*, August 30, 2017, <http://thediplomat.com/2017/08/china-refuses-to-condemn-north-koreas-new-missile-launch/>. Accessed on September 20, 2017.

building a huge military complex near the standoff site.⁵² Moreover, the long-pending issues between India and China remain intact. The problems also arise from China's naval expansion under the 'string of pearls' strategy, and, primarily with its increased presence in the Indian Ocean Region (IOR), are a cause of concern for India. China had blocked India's move to include Pakistan-based terrorist organisations such as the Lashkar-e-Taiba (LeT) and Jaish-e-Muhammad (JeM) as UN designated terrorist organisations, and it defended Pakistan by saying that terrorism should not be linked to any country or religion. However, in a surprising move, China mentioned the names of the LeT, Haqqani network, and JeM along with the Islamic Movement of Uzbekistan and East Turkestan Islamic Movement during the September 2017 Brazil, Russia, India, China and South Africa (BRICS) Summit in Xiamen.⁵³ Another issue that is creating a problem between India and China is India's entry into the Nuclear Suppliers' Group (NSG). China has blocked India's admission into this group and insisted that the group should devise the criteria for the admittance of new members first, before making exceptions for any country. China emphasised that NSG membership should be given to Pakistan as well, along with India. Its 'technical hold' on Masood Azhar, the head of the JeM, being designated an international terrorist by the UN sanctions committee was also problematic for India.⁵⁴ The China-Pakistan Economic Corridor (CPEC) which passes through Pakistan-occupied Kashmir (PoK), the border dispute related to Arunachal Pradesh, and the issue of the Dalai Lama are other thorns in the relationship between India and China. The power struggle between India and China over Asian dominance has increased the complexity of this relationship.

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52. PTI, "China Justifies Massive Construction in Doklam, Says Aimed at Improving Lives of Troops," *News 18*, January 19, 2018, <http://www.news18.com/news/world/infrastructure-in-doklam-aimed-at-improving-lives-of-troops-china-1636859.htm>. Accessed on January 22, 2018.
 53. Harsh V. Pant, "India and China May Have Pulled Back on the Himalayan Frontier, but the Bilateral Chill is Real," *Quartz*, September 18, 2017, <https://qz.com/1079868/doklam-standoff-india-and-china-may-have-pulled-back-on-the-himalayan-frontier-but-the-bilateral-chill-is-real/>. Accessed on September 21, 2017.
 54. Gurmeet Kanwal, "China's Insecurity Leads to India's NSG Bid Being Blocked Again," *The Quint*, June 28, 2017, <https://www.thequint.com/voices/opinion/china-blocks-india-nsg-bid-again>. Accessed on September 21, 2017.

HOW WILL THE DEAL HELP INDIA AND JAPAN?

Negotiations between India and Japan for a Civil Nuclear Agreement (CNA) started in 2010, but due to the Fukushima nuclear disaster of 2011, the talks were suspended. The talks resumed in 2013 between Indian PM Manmohan Singh and his Japanese counterpart Shinzo Abe. Since then, after four years of continuous negotiations, finally, in July 2017, the CNA came into force. That was a historic moment in India-Japan relations as India—a non-NPT and non-CTBT signatory country—became the first and only country to sign this kind of agreement with Japan. For Japan—the only country that had seen the horror of use of nuclear weapons—it was a difficult choice. Shinzo Abe had to go the extra mile to get it passed in the Japanese Diet.

In December 2015, the memorandum was signed between PMs Narendra Modi and Shinzo Abe, and after that, it took two more years to finalise the technical details, including the necessary internal procedures in Japan to ink the final agreement. In November 2016, the agreement was signed when Narendra Modi visited Japan, and in July 2017, the deal came into force. The agreement allows Japan to export sophisticated nuclear technology to India. Japan has also agreed to help in managing radioactive waste processing and management, and cooperate in all features of the nuclear fuel cycle, including nuclear fuel fabrication. Both countries also decided to collaborate and share best practices in the area of nuclear safety, including radiation and environmental protection, and intervention, and response to a radiation emergency or nuclear accident.⁵⁵

However, there were differences related to the “nullification clause” in the agreement. The nullification clause is “the agreement to halt Japanese cooperation with India if it conducts a nuclear test.” India was not ready to include this clause as it would disrupt its nuclear power programme. In the final agreement, there is no such clause. However, Article 14 of the agreement talks about termination. The first paragraph of Article 14 says,

55. Reshmi Kazi, “India-Japan Civil Nuclear Deal: A Historic Step Towards an Effective Global Nuclear System,” *The Dialogue*, July 25, 2017, <http://www.thedialogue.co/india-japan-civil-nuclear-deal-historic-step-towards-effective-global-nuclear-system/>. Accessed on November 15, 2017.

*Either Party shall have the right to terminate this Agreement prior to its expiration by giving one year's written notice to the other Party. A Party giving notice of termination shall provide the reasons for seeking such termination. This Agreement shall terminate one year from the date of written notice, unless the notice has been withdrawn in writing by the Party giving such notice prior to the date of termination or the Parties otherwise agree.*⁵⁶

Not having a nullification clause shows the trust each party has placed on the other. This is the reason why having secured an agreement with Japan is being considered to be as important as the India-US deal. Whereas the agreement with the US opened the doors for nuclear trade for India, the agreement with Japan is seen as a moral victory for India's nuclear programme and nuclear community. Moreover, both countries will gain from this deal. Japan is a major player in the field of nuclear energy and produces 80 percent of the world's total reactor cores. Japan specialises in the steelwork that is required for building Light Water Reactors (LWRs).⁵⁷ The Japanese conglomerate Toshiba owns the US-based nuclear plants makers Westinghouse and another Japanese business house, Hitachi, has a joint venture with General Electric (GE) known as GE-Hitachi. Both these companies are planning to build nuclear reactors in India. This deal will make it easier for these companies to invest in India's nuclear energy market. The Japanese companies will get the business and India will obtain the technology. Though the deal is done, many challenges remain for both parties to gain benefits from it.

Challenges

There is worldwide opposition to nuclear energy, whether peaceful or otherwise. Because of the horrible experience of Hiroshima and Nagasaki,

56. MOFA, "Agreement Between the Government of Japan and the Government of the Republic of India for Cooperation in the Peaceful Uses of Nuclear Energy," MOFA, 2017, <http://www.mofa.go.jp/files/000202920.pdf>. Accessed on November 15, 2017.

57. Hina Pandey, "Here's Why the Nuclear Deal Between Japan and India Matters," CAPS, June 7, 2017, http://capsindia.org/files/documents/CAPS_Infocus_HP_15.pdf. Accessed on November 16, 2017.

the resistance in Japan even for the peaceful use of nuclear power is high. Nevertheless, because of the lack of natural energy resources, the Japanese people have learnt to live with nuclear power as long as it is for civilian use. But the Fukushima nuclear disaster of 2011 brought back those memories and the protests to stop any use of nuclear power increased.

Japan has had a strong anti-nuclear lobby since the post-War period, and that lobby got an impetus after the disaster of 2011. Such groups are now urging both India and Japan to halt the nuclear power programme. One such group, "The Women of Fukushima," issued an appeal in an open letter to Narendra Modi, to visit the disaster area for a first-hand experience of the consequences of nuclear power.⁵⁸ Moreover, in India too, land acquisition has been a major problem that Japan also is facing, even for setting up industrial zones. When it comes to a nuclear power plant, the people's resistance intensifies against giving up their land. Earlier, there has been opposition to acquisition of land for a nuclear power plant proposed to be set up at Kovvada in Srikakulam district of Andhra Pradesh.⁵⁹ A similar situation can arise in the future also which can deter Japan's business houses from investing in India. The domestic political scene in Japan can also create problems, as Japan's main opposition party, the Democratic Party of Japan (DPJ) had spoken out against the deal during the Lower House debate. The DPJ was primarily concerned about the exclusion of the term "nuclear tests" as a condition to halt the pact. Japan has signed similar nuclear deals with Vietnam and Jordan, which specify that in the case of "nuclear tests", Japan will suspend cooperation and terminate the agreement. The DPJ is also concerned about a provision that gives India special consideration in cases where a third-party state acts (for example, a nuclear test by China or Pakistan) in a way that threatens India's national security. According to the agreement, Japan

58. "Japan, India Sign Agreement on Civil Nuclear Power," *Al Jazeera*, November 12, 2016, <http://www.aljazeera.com/news/2016/11/japan-india-sign-agreement-civil-nuclear-power-16111164153096.html>. Accessed on November 16, 2017.

59. "Land Acquisition for Nuke Plant Opposed," *The Hindu*, November 12, 2016, <http://www.thehindu.com/news/cities/Visakhapatnam/Land-acquisition-for-nuke-plant-opposed/article11757245.ece>. Accessed on November 16, 2017.

The reason behind China's opposition is that entry into the NSG would further strengthen India's credentials as a rightful member of the nuclear non-proliferation mainstream. India would be on an equal footing with the China and other nuclear power states if it succeeded in joining the NSG.

may not, in such case, be able to terminate the deal.⁶⁰ If, in the future, the DPJ comes into power, it may carry out the necessary changes to live up to its opposition to the India-Japan nuclear deal.

Reactions of China and Pakistan to the India-Japan Civil Nuclear Deal

China's reaction to the India-Japan deal was surprisingly mild but had a cautious tone. The Chinese Foreign Ministry spokesman Geng Shuang said in a media briefing, "With regard to the nuclear agreement signed between India and Japan on the

use of nuclear energy, we believe that under the promise of observing the international obligation of nuclear non-proliferation, all countries are entitled to the peaceful use of nuclear energy." He also mentioned, "At the same time, the relevant cooperation should be favourable to safeguard the authority and effectiveness of the international nuclear non-proliferation regime." However, this statement is very different from the criticism in the Chinese media. The state-run *Global Times* criticised Japan for relaxing the rules for this deal and opined that the deal would "taint Tokyo's reputation of advocating for a nuclear weapon-free world."⁶¹

China is also against India's entry into the NSG, and in June 2017, during the 27th Plenary Meeting in the Swiss city of Berne, it voiced its opposition. The reason behind China's opposition is that entry into the NSG would further strengthen India's credentials as a rightful member of the nuclear non-proliferation mainstream. India would be on an equal footing with

60. "Japan-India Nuclear Pact Clears Lower House Despite Opposition Concerns," *The Japan Times*, May 16, 2017, <https://www.japantimes.co.jp/news/2017/05/16/national/politics-diplomacy/japan-india-nuclear-pact-clears-lower-house-despite-opposition-concerns/#.Wg1RKWiCwnk>. Accessed on November 16, 2017.

61. "China Cautiously Backs India-Japan Nuclear Deal," *The Times of India*, November 14, 2016, <https://timesofindia.indiatimes.com/world/china/China-cautiously-backs-India-Japan-nuclear-deal/articleshow/55416323.cms>. Accessed on November 16, 2017.

China and other nuclear power states if it succeeded in joining the NSG. Moreover, Pakistan is not considered on par with India when it comes to membership of the NSG. China is apprehensive that once India is given entry into the NSG, it could block any plan of Pakistan to enter the group.⁶²

On the other hand, Pakistan, unsurprisingly, is against the deal and called it “discriminatory.” Pakistan also fears that the deal can undermine regional stability. Pakistan’s Foreign Ministry spokesman said that Pakistan had urged Japan and the other countries “to objectively assess the consequences of discriminatory approaches to our region.” He also mentioned that this would allow India to expand its nuclear power industry and negatively impact the strategic balance in the region: “It has allowed India to gain access to foreign sources of nuclear fuel and freed up its domestic reserves which are being utilised for rapid expansion of its military nuclear program.”⁶³

Japan is known in the world for its efforts towards nuclear non-proliferation and, India, in its own way, has never propagated the use of atomic weapons. Though the approach of India and Japan towards nuclear non-proliferation is different, both countries are against the proliferation of nuclear weapons.

CONCLUSION

The nuclear deal between India and Japan has started a new chapter in India-Japan relations. Japan has advanced nuclear technology which it can now export to India. Japanese business houses will get business, which will help the Japanese economy. As India’s reliance on energy resources is increasing due to the growing demand to sustain its economic growth, nuclear energy has the potential to play a significant role in that. Nuclear

62. Kate Sullivan, and Nicola Leveringhaus, “China’s Stance on NSG Membership Shows the Extent of India’s Challenge in the Global Nuclear Order,” *The Wire*, June 30, 2017, <https://thewire.in/152726/india-china-nsg-global-nuclear-order/>. Accessed on November 17, 2017.

63. “Pakistan Raps What it Called Japan’s ‘Discriminatory’ Nuclear Deal with India,” *The Japan Times*, November 12, 2016, <https://www.japantimes.co.jp/news/2016/11/12/national/politics-diplomacy/pakistan-raps-called-japans-discriminatory-nuclear-deal-india/#.Wg1b7GiCwnk>. Accessed on November 16, 2017.

power is a clean source of energy in comparison to the traditional energy resources such as coal and oil. This deal, along with India-US civil nuclear agreement, will help India transform its nuclear status. Now, with Japan on its side, the world has started seeing India as a responsible nuclear power. Moreover, Japan is known in the world for its efforts towards nuclear non-proliferation and, India, in its own way, has never propagated the use of atomic weapons. Though the approach of India and Japan towards nuclear non-proliferation is different, both countries are against the proliferation of nuclear weapons. Even from a strategic perspective, the India-Japan nuclear deal will help both nations to achieve harmony in the Indo-Pacific region. Now that the nuclear thorn has been removed, the India-Japan partnership has the potential to reach higher levels of cooperation that can only be a win-win situation for both.

IRAN AND RUSSIA: BUILDING A STRATEGIC PARTNERSHIP

ANU SHARMA

INTRODUCTION

Iran's relations with Russia have fluctuated between mistrust and forging a strategic partnership. For sure, the relations between the two countries have never been simple. The geopolitical reality, since the disintegration of the Soviet Union, led both countries to find mutually reasonable grounds for cooperation. The current intensity in Iran-Russia relations is definitely unprecedented and, therefore, requires a detailed analysis for a better understanding of international relations. During the most dramatic times in history, both Iran and Russia have maintained diplomatic and bilateral relations for mutual benefit. Iran-Russia relations have reached unprecedented heights in the recent times, stimulated by military cooperation in Syria, and in criticising the Western policies in the West Asian region. The recent hostility of US President Trump towards the Iranian nuclear deal has pushed Iran to look towards Russia and China.

Currently, Tehran is important for Moscow's grand plans in the unstable Persian Gulf region, which definitely requires careful handling and balancing. Moscow can provide Tehran a critical means of protecting its regional security interests. It is in this context that Iran-Russia relations have been often referred to as a "strategic alliance" by scholars all around the world. A strategic alliance may be defined as one that is based on cooperation against

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The relations between Russia and Iran are deepening, based on their determination to achieve their geopolitical interests in the region. This ongoing process of alliance formation between the two nations is important and has the ability to reverberate throughout the West Asian region.

a threat from a specific state and has a long-term institutional base. In contrast, strategic cooperation is not aimed at another state and has a short-term and case-by-case character. In the case of Iran and Russia, despite the significant differences related to regional issues in the post-Soviet phase, both believe that cooperation on various fronts can help both countries strategically in the long run. However, strictly speaking, Iran is not in any formal alliance with Russia. At the same time, it is also correct to say that both Iran and Russia have a mutual ally in Syria. The

relations between Russia and Iran are deepening, based on their determination to achieve their geopolitical interests in the region. This ongoing process of alliance formation between the two nations is important and has the ability to reverberate throughout the West Asian region. Iran and Russia view their cooperative relationship as an important tool for preventing the spread of the US influence in the region. Undoubtedly, Russia considers Tehran to be of strategic importance for increasing its own influence. However, currently, Russia needs Iran in its Syrian venture as much as Iran needs Russia to maintain its influence in the country by keeping Syrian President Bashar al-Assad in power.

In this respect, the aim of this paper is to understand the current contours of the bilateral relations between Iran and Russia. The signing of the Iranian nuclear deal in 2015 opened up new horizons for Iran in terms of engaging with other countries. Russia plays an important role in Iran's geopolitical strategy in the larger Eurasian region. The paper is divided into four sections: the section on the historical background discusses the beginning of mistrust between the two nations since World War I. This happened due to Russia's expansionist policies at that time, and Iran joining the US camp to contain the Communist threat. However, the shift in policies began after Russian President Vladimir Putin returned to power in 2012, which is covered in the second section. The third section deals with the present state of relations

between Iran and Russia. Both Iran and Russia have a mutual ally in Syria which becomes a convergence point for them. Not only that, the military trade between Iran and Russia is also growing steadily. The fourth section discusses the challenges that this relationship is facing, with the North Atlantic Treaty Organisation (NATO) being the tool of the US. The paper concludes that though the relationship between Iran and Russia is a strategic one, based on various points of convergence, the current scenario, with the US withdrawing from the Iranian nuclear deal, can affect this burgeoning relationship.

Both Iran and Russia have a mutual ally in Syria which becomes a convergence point for them. Not only that, the military trade between Iran and Russia is also growing steadily.

HISTORICAL BACKGROUND

There is a lot of mistrust in Iran-Russia relations that runs deep in the history of both nations. After World War I, Iran and the Soviet Union signed the Russo-Persian Treaty of Friendship in 1921. This treaty granted the newly established Soviet government—at that time—the authority to enter Iran to deal with anti-Soviet activities or threats. However, the Soviets used this treaty to compel the Iranians to declare their friendship with the Soviet Union and later cited the treaty as justification for their refusal to withdraw their troops from Iran.¹ By the early 1940s, the relationship between the Soviet Union and Iran was strained. During World War II, the Soviet Union and Great Britain jointly occupied Iranian territories to prevent Germany from using Iran as a platform against the Soviet Union.

After World War II, the Soviet Union kept its troops in Iran with the purpose of bringing Azerbaijan under the Soviet domination through its support of Iran's pro-Soviet party, the Tudeh. Even after the withdrawal of Soviet troops in 1946, the Anglo-Iranian Oil Company held a monopoly on Iranian oil, thereby compelling Iran to share its oil resources with the Soviets. This was also the time when the political system was in turmoil in Iran

1. Jay Sekulow, *Unholy Alliance: The Agenda Iran, Russia and Jihadists Share for Conquering the World* (New York: Howard Books, 2016), p. 163.

with the newly appointed Iranian Prime Minister Mohammad Mossadegh nationalising the oil company to take control of Iranian natural resources.² The US sought to curtail this growing influence of the Soviet Union in Iran, and it accomplished this by its assistance, along with Great Britain, in a coup, and working with Mohammad Reza Shah Pahlavi to remove Mossadegh from power,³ as the US feared that the nationalisation of the oil company was the first step towards Iran's alignment with the Soviet Union.

Relations between Iran and the Soviet Union deteriorated in the mid-1950s, with Iran forming the Baghdad Pact in 1955 along with Iraq, Pakistan, Turkey and the United Kingdom, designed to prevent Communist incursions and to foster peace in West Asia. This pact was also referred to as the 'Northern Tier' to prevent Soviet expansion. During the Cold War, Moscow still hoped to establish ties with the Iranian regime, fuelled by the latter's fervent anti-American rhetoric. Under the Shah's regime, Iran was an ally of the US; and both the US and Iran viewed the Soviet Union as a threat. In Iran, the Islamic revolution gave rise to a radical clerical regime that was based on the agenda of "neither West nor East". Soviet support to Iraq during the Iran-Iraq War also pushed Iran to take an anti-Soviet stance. Many analysts believe that Iran's victimisation at the hands of the stronger Soviet Union created widespread hostility among the Iranians against the Soviet Union. In the same period, Moscow invaded Afghanistan, Iran's immediate neighbour, which further fuelled the Iranians' suspicions against the Soviets. Slowly, the trend in Iran changed to pragmatic voices asking for economic and military cooperation with the Soviet Union but the religious fundamentalists did not consider collaboration with the atheistic Communists an acceptable option.⁴ The late 1980s was the time when Iran was grappling with its war-torn economy and the Soviet Union was on the verge of disintegrating. The collapse of the Soviet Union in 1991 constituted a window of opportunity for a restart in Russo-Iranian relations. However,

2. Ibid.

3. Ibid.

4. Moritz A. Pieper, "Russia and Iran: Strategic Partners or Competing Regional Hegemons?", *Inquiries Journal*, vol. 4, no. 4, 2012, <http://www.inquiriesjournal.com/articles/631/russia-and-iran-strategic-partners-or-competing-regional-hegemons-a-critical-analysis-of-russian-iranian-relations-in-the-post-soviet-space>. Accessed on January 1, 2017.

this 'new great game' was related more to the sphere of influence in Central Asia between Iran and Russia. Here, applying the concept of a 'Regional Security Complex,' it is revealed how Russo-Iranian relations have a significant impact on Central Asia, the Caucasus and the wider West Asia.⁵ The concept of a Regional Security Complex was a theory advanced by Barry Buzan and Ole Weaver.⁶ The concept demonstrates how security is clustered in a geographically shaped region. It is based on the common understanding of threat perceptions and security interdependence of states within a region. This theoretical concept explains the increasing demand for regional security arrangements (both indigenous and great power sponsored) emerging as a key feature of the post Arab Spring security order in West Asia.⁷ In view of this, the regional security analysis of West Asia requires a major reorientation towards patterns of security interdependence. In this context, Russia plays an important role in Iran's development of its security infrastructure.

Since 1989, however, the cooperation between Moscow and Tehran has increased. Russia agreed to complete the nuclear reactor at Bushehr, which was started by the German company Siemens during the Shah's regime but was stopped after the Iranian Revolution in 1979. Russia began selling weapons, including missiles, to Iran. Along with China, Russia tried to weaken and delay the US and European efforts to impose UN sanctions on Iran over its nuclear programme.⁸ This effort continued into the next decade, and although Iran and Russia engaged in some geopolitical rivalry throughout the 1990s, particularly in Central Asia, this did not hinder their cooperation, especially when faced with external threats. After the disintegration of the USSR, bilateral relations between Russia and Iran deepened. As Russia abandoned its Soviet atheistic ideology and adopted a more pragmatic approach to foreign affairs, it was no longer seen as a potential threat, especially to Iranian territorial integrity. This was because of two reasons: firstly, because Russia was

5. Ibid.

6. Barry Buzan and Ole Weaver, "Regional Security Complex: The Theoretical Concept Developed", 2003.

7. Barry Buzan, "Regional Security Complex Theory in the Post-Cold War World", in F. Soderbaum and T.M. Shaw, eds., *Theories of New Regionalism. International Political Economy Series* (London: Palgrave Macmillan, 2003), pp. 140-159.

8. Mark N. Katz, "Iran and Russia", *Iran Primer*, August 2015, <http://iranprimer.usip.org/resource/iran-and-russia>. Accessed on February 18, 2017.

During the period 1989-91, the Kremlin signed arms supply deals with Tehran worth \$5.1 billion, and Iran emerged as the biggest client of the Soviet arms industry. Tehran, however, opted not to side with Moscow in its war with the Chechen rebels in 1994-96.

preoccupied with its own internal problems; and, secondly, because the two countries no longer shared common territorial borders. For these reasons, the friendly relations between Iran and Russia seemed less critical and, therefore, easier for Russia to cultivate. Russia, without the Soviet Union's vast bands of "buffer territory" and also without its influence, found itself in need of allies to help maintain stability along the borders.⁹

This was also the time when Iran and Russia developed military cooperation, stemming from their respective isolation from the Western countries. Iran purchased several billion dollars of weaponry from Russia. However, the intricate relations between Iran and Russia slowly began to change following the end of the Iran-Iraq War (1988), the death of Iranian Supreme Leader Ayatollah Khomeini (1989) and the Soviet withdrawal from Afghanistan in 1989. During the period 1989-91, the Kremlin signed arms supply deals with Tehran worth \$5.1 billion, and Iran emerged as the biggest client of the Soviet arms industry. Tehran, however, opted not to side with Moscow in its war with the Chechen rebels in 1994-96. But both Moscow and Tehran supported the Afghan forces in opposing the Taliban. However, the uneasiness remained over the Russians signing an agreement with the US, in which Russia agreed to limit the amount of weaponry and nuclear knowhow it provided to Iran.¹⁰

9. Lana Ravandi-Fadai, "Russo-Iranian Relations and the Vienna Nuclear Agreement", November 2015, <http://english.dohainstitute.org/file/get/5989e726-f6ba-4a30-9a03-264648225104.pdf>. Accessed on March 2, 2017.

10. Ibid. The Gore-Chernomyrdin Agreement or US-Russian Joint Commission. In June 1995, US Vice President Al Gore signed a secret agreement with Viktor S. Chernomyrdin, the then Russian prime minister, calling for an end to all Russian sales of conventional weapons to Iran by the end of 1999. In exchange for the Russian promises, the US pledged not to seek penalties against Russia under a 1992 law that requires sanctions against countries that sell advanced weaponry to countries the State Department classifies as state sponsors of terrorism. Iran is on that list. The law was rooted in concerns about Russian sales to Iran of some of the same weapons that the Gore-Chernomyrdin agreement expressly allowed. Read more: <http://www.nytimes.com/2000/10/13/world/despite-a-secret-pact-by-gore-in-95-russian-arms-sales-to-iran-go-on.html>. Accessed on March 1, 2017.

It is important to know that even during the sanctions, Russia did not break economic ties with Iran. However, the barrier remained in the difficulty of converting the Iranian Rial into other currencies, during the financial sanctions.

When Putin came to power in August 1999, he endorsed improving relations with Iran and participation in major arms sales.¹¹ By 2001, Iran became the third largest foreign buyer of Russian weaponry. In December 2005, Tehran signed a billion-dollar arms deal that included 29 Tor-M1 air-defence missile systems to protect the Bushehr nuclear power plant. In early 2006, Russia also invested \$750 million in energy projects in Iran.¹²

There occurred a visible shift in relations between Iran and Russia after Vladimir Putin's return to the presidential office in 2012. A rapprochement between Russia and Iran at that time led to substantive bilateral and qualitative changes in the bilateral relations.

SHIFT IN IRAN-RUSSIA RELATIONS

There occurred a visible shift in relations between Iran and Russia after Vladimir Putin's return to the presidential office in 2012. A rapprochement between Russia and Iran at that time led to substantive bilateral and qualitative changes in the bilateral relations. The visit of Russian Foreign Minister Sergey Lavrov to Tehran in June 2012 demonstrated a political agenda which involved increased cooperation between the two in Syria and Afghanistan.¹³ Eventually, the bilateral dialogues between the two nations increased significantly. In fact, the Kremlin started advocating Iran's involvement in international discussions on Afghanistan, Iraq and Syria.¹⁴

11. Anna Borshchevskaya, "The Tactical Side of Russia's Arms Sales to the Middle East", December 20, 2017, https://jamestown.org/program/tactical-side-russias-arms-sales-middle-east/#_edn21. Accessed on May 8, 2018.

12. Ibid.

13. Nikolay Kozhanov, "Understanding the Revitalization of Russian-Iranian Relations", *Carnegie Moscow*, May 2015, https://carnegieendowment.org/files/CP_Kozhanov_web_Eng.pdf. Accessed on May 3, 2018.

14. Thomas Erdbrink, Sewell Chan and David E. Sanger, "After a U.S. Shift, Iran Has a Seat at Talks on War in Syria", *The New York Times*, October 28, 2015, <https://www.nytimes.com/2015/10/29/world/middleeast/syria-talks-vienna-iran.html>. Accessed on May 3, 2018.

Post 2012, the Russian authorities had also started pushing an unofficial diplomatic strategy which involved a balancing act between Iran and its political opponents such as the US, Israel and other Gulf Cooperation Council (GCC) members. Another factor attributed to this increased engagement between the two was the lack of a decisive reaction from other international players. Russia believed that the Western involvement in the West Asian region had reached a plateau and was exhausted by its involvement in the wars in Iraq and Afghanistan. Therefore, the Western alliances seemed unwilling to intervene militarily in Syria, Yemen, etc., thereby giving Russia a chance to reassert itself in the region through its support to Iran.¹⁵

However, despite the complicated situation of Russian acceptance of the sanctions against Iran, Moscow and Tehran adopted a common position on a number of regional issues in 2012. First and foremost, both sought to maintain peace and stability in the former Soviet states or Central Asian states, the Caucasus and Afghanistan. Asserting Russia's presence in West Asia, including through the strengthened alliance with Iran, was one of the ways to do so. Not only did Russia reinforce its objections to any proposals of sanctions on Iran, it also invited Tehran to join the Shanghai Cooperation Organisation (SCO) as an observer state. It was during the first two years of the Obama Administration that the Russian government reversed its stand on Iran's sanctions, despite extensive concessions made by the US to eliminate the sources of a perceived threat to Russia. President Barack Obama made certain changes in the Strategic Arms Reduction Treaty (START) agreement favouring the Russian neighbours—Ukraine and Georgia—that had comprised the bone of contention with Russia during President Bush Jr.'s terms.¹⁶ It is important to note that Russia competes with Iran as an energy provider in the natural gas market. The Arab uprisings that began in 2011, left Moscow with a shrinking political and economic presence in West Asia. This outcome demanded that Moscow be more active in maintaining contacts with Tehran. Since 2012, the Russians have been actively

15. Ekaterina Stepanova, "Russia in the Middle East: Back to a "Grand Strategy" – or Enforcing Multilateralism?", *Politique étrangère*, 2016, https://www.cairn-int.info/article-E_PE_162_0023--russia-in-the-middle-east.htm. Accessed on May 8, 2018.

16. Nikolay Kozhanov, "Understanding the Revitalization of Russian-Iranian Relations", May 5, 2015, *Carnegie Paper*, <http://carnegie.ru/2015/05/05/understanding-revitalization-of-russian-iranian-relations-pub-59983>. Accessed on March 7, 2017.

involved in the negotiations related to the Iranian nuclear programme. Russian diplomats were actively engaged in the November 2014 talks between Iran and the P5+1 countries. The agreement between Russia and Iran in November 2014 to construct up to eight new power plant units in Iran is considered by some analysts as part of Moscow's efforts to settle the nuclear issue.¹⁷ The first two reactors were expected to be built at the Bushehr power plant, in addition to the power-generating block that was built by Russian engineers and handed over to the Iranians in 2013. In May 2018, Russia had started work on Phase 2 of the Bushehr nuclear power plant. The construction of the power plant's second and third phases began in November 2017. It was reported at the time that the two phases would begin supplying electricity to Iran's power grid in the next ten years.¹⁸

Since 2012, Russia's relations with Iran have improved significantly and this improvement is visible in the cooperation and coordination of military activities in Syria and plans for a substantial increase in the weapons trade, nuclear infrastructure, economic ventures and bilateral trade.

Iran and Russia in Syria: The Syrian conflict has provided the opportunity for Russia and Iran to put their newly aligned world outlook to the test. This also happened with the aim of preserving their respective interests at a time when Damascus was at its weakest. But while they have forged a broadly effective military coalition, their strategies in Syria may ultimately diverge on some fundamental issues. One of them refers to the position of Russia in the international system. Russia, as a great power, has a variety of relations with other actors, including the US, Israel, Turkey and Arabian countries in the region and these relations have influenced Russia's approach toward the Syrian crisis.¹⁹ Russia's engagement in Syria is also inspired by its desire to preserve its position in the region.

The joint goal of Iran and Russia is to preserve the Assad regime as a means to guarantee their respective core interests in the region. On the military front,

17. Sekulow, n.1.

18. "Rosatom Begins Work at Phase 2 of Bushehr Power Plant", *Press TV*, May 4, 2018, <http://www.presstv.com/DetailFr/2018/05/04/560578/Iran-Russia-nuclear-power-plant-Bushehr-United-States>. Accessed on May 8, 2018.

19. *Ibid.*

Syria is vital for Iran, as any adverse scenario would shrink Iran's influence in the region, leaving Tehran with only Iraq and Hezbollah. For Russia, Syria provides vital access to the Mediterranean, through the naval facility in Tartus.

Moscow's intervention in September 2015 was critical for supporting Assad's position and Iran's Revolutionary Guard Corps (IRGC) involvement in Syria. Similarly, in August 2016, Russia and Iran increased their military cooperation through an intensified bombing and ground offensive in Aleppo after rebel groups pushed back advances made by the pro-regime forces.²⁰ The military cooperation between Iran and Russia in Syria has also targeted perceived extremist opposition forces and the Islamic State (ISIS). The longevity of the Assad regime in Syria

will determine what its strategic objective is in the Russia-Iran convergence over this issue.

Syria is vital for Iran, as any adverse scenario would shrink Iran's influence in the region, leaving Tehran with only Iraq and Hezbollah. For Russia, Syria provides vital access to the Mediterranean, through the naval facility in Tartus. Russian President Putin's decision to side with Assad is two-fold: the prevention of possible Western expansion in Syria; and, secondly, it can become an opportunity for Russia to reclaim its role in international politics as a great power.²¹ But in Syria, the cooperation between Iran and Russia has been strengthened significantly. The Iranian armed forces have allowed Russian aircraft to use not only the Iranian air space but also the Iranian air base in Syria.²² This demonstrates Russian dependence on Iran in Syria. This cooperation may result in cementing the relationship between Iran and Russia in the future with the mutual interest being Syria.

Economic Relations: On the economic front, opposition to the sanctions on Iran served the economic interests of cash-starved Russia,

20. Ellie Geranmayeh and Kadri Liik, "The New Power Couple: Russia and Iran in the Middle East", September 13, 2016, http://www.ecfr.eu/publications/summary/iran_and_russia_middle_east_power_couple_7113. Accessed on March 10, 2017.

21. Zakia Aqra, "Russo-Iranian Relations: A Friendship Found between Tactic and Strategic Partnership", no. 75, February 24, 2016, https://cemmis.edu.gr/files/russo_iranian_relations_friendship.pdf. Accessed on February 18, 2017.

22. Ibid.

whose domestic procurement of nuclear and military technologies, equipment and machinery was too low to keep its defence and nuclear industries afloat. Russia had benefitted from its military ties with Iran and the construction of the reactor at Bushehr. Furthermore, in the subsequent years, Iran became Russia's third largest weapons' customer. In 2005, Russia was the seventh largest trade partner of Iran, with 5.55 percent of all exports to Iran originating from Russia.²³ Trade relations between the two increased from \$1 billion in 2005 to \$3.7

billion in 2008.²⁴ Motor vehicles, fruits, vegetables, glass, textiles, plastics, chemicals, hand-woven products, stone and plaster products were among the main Iranian non-oil goods exported to Russia.²⁵ According to Reuters, in 2014, Iran and Russia had made progress in the oil for goods deal, worth up to \$20 billion.²⁶ Relations between Russia and Iran had strengthened as both countries were under the US sanctions and were seeking new trade partners.

Therefore, by supporting the sanctions on Iran, Russia had risked losing a solvent international customer in Iran. This acceptance of the sanctions on Iran by Russia remains inexplicable. Also, economic pragmatism fails to explain why Russia supported the UN Security Council Resolution of sanctions against Iran in 2006-08 and again in 2010. One explanation can be that the conflict between the US and Iran was beneficial to Moscow, which capitalised on the Russian antagonism for pursuing its broad political, economic and ideological agendas. The relationship soured further when

On the economic front, opposition to the sanctions on Iran served the economic interests of cash-starved Russia, whose domestic procurement of nuclear and military technologies, equipment and machinery was too low to keep its defence and nuclear industries afloat.

23. Nader Habibi, "The Cost of Economic Sanctions on Major Exporters to Iran", May 5, 2006, <http://www.payvand.com/news/06/may/1046.html>. Accessed on March 1, 2017.

24. Ibid.

25. "Moscow Urged to Do More to Facilitate Trade", *Financial Tribune*, September 15, 2015, <https://financialtribune.com/articles/domestic-economy/25856/moscow-urged-to-do-more-to-facilitate-trade>. Accessed on January 26, 2018.

26. Jonathan Saul and Parisa Hafezi, "Iran-Russia Working to Seal \$20 Billion Oil for Goods Deal-Sources", *Reuters*, April 2, 2014, <http://www.reuters.com/article/us-iran-russia-oil-idUSBREA311K520140402>. Accessed on March 8, 2017.

Russian President Dmitry Medvedev cancelled the agreement to sell S-300 air defence missile systems to Iran in 2010.²⁷

On the trade front, post-the Joint Comprehensive Plan of Action (JCPOA) Russia had nothing much to lose. Moreover, when the European companies pulled out of Iran post-the 2010 sanctions, the Russian companies failed to make an impact or substantial economic gains. In 2011-14, Iran's share of Russian foreign trade decreased from 0.5 percent to 0.2 percent. By 2014, total Russian investments in Iran were also unimpressive: they amounted to less than \$50 million.²⁸ At the same time, the areas in which Russian companies have managed to achieve certain successes (such as nuclear energy) are traditional Russian strengths, and there are chances that Western competition may stimulate Russian activities in these fields.

PRESENT STATE OF AFFAIRS

In 2016, Russia's use of Iranian air bases to bomb targets across Syria marked a new development in Iran-Russia relations. Moscow had reentered West Asia after a break of almost a quarter century; Russia understands the importance of Iran as an important country on the periphery of its southern borders. Also, Russia is fully ready to engage with Iran on a wide range of bilateral, regional, and international issues involving trade, energy, and security. Yet, even as the two countries share many goals and the cooperation looks promising, the relationship is still relatively fragile, and there are policy disagreements between them which must be handled deftly.²⁹ One such suspicion stems from the fact that Russia is involved in the strong ongoing dialogue with the US, Israel and the Arab states of the Persian Gulf on the future of Syria. This makes Iran wary and resentful

27. Anu Sharma, "BAVAR 373: Boosting Iranian Air Defence", *CAPS In focus*, August 30, 2016, http://capsindia.org/files/documents/CAPS_Infocus_ANS_07.pdf. Accessed on March 3, 2017.

28. *Ibid.*

29. Dmitri Trenin, "Russia and Iran: Historic Mistrust and Contemporary Partnership", *Carnegie Moscow*, August 18, 2016, <http://carnegie.ru/2016/08/18/russia-and-iran-historic-mistrust-and-contemporary-partnership-pub-64365>. Accessed on May 3, 2018.

of Russian intentions vis-à-vis Syria.³⁰ Also the relationship between Iran and Russia has its own complexities and mutual distrust arising out of its turbulent history. Hence, under the present circumstances, the relationship can only be termed as complicated.

In 2016, Iran and Russia signed an agreement for the supply of around \$10 billion worth of Russian arms and military hardware to Iran.³¹ In the same year, Russia began construction of new nuclear plants in Iran. The project was conducted jointly by the Atomic Energy

Organisation of Iran and Russia's Rosatom. The new power plants will triple Iran's nuclear-generated electricity production to about 3.3 thousand megawatts a year.³² This explains the increased level of engagement between Russia and Iran. The largest example was the supply of the S-300 anti-aircraft missile systems. The first batch of the S-300 was delivered in April 2016. The executor of the \$900 million contract was the Almaz-Antey Company.³³ According to RBC, the total volume of supply of products under the "secret code" to the Islamic Republic in 2016 was worth more than \$300 million. Under the sanctions, this figure did not exceed a few million dollars.³⁴ Removal of banking hurdles and sanctions has led to the expansion of financial ties between Iran and Russia. In the financial year 2017, Iran exported \$400 million worth of commodities to Russia while the value of imports exceeded

One of the issues which still affects the trade relations is that Iranian traders cannot transfer money to Russia through the normal banking channels and the exchange rate of the rial against the ruble is not stable.

30. Alex Vatanka, "Iran and Russia: Growing Apart", *Foreign Affairs*, November 2017, <https://www.foreignaffairs.com/articles/syria/2017-11-29/iran-and-russia-growing-apart>. Accessed on May 4, 2018.

31. Franz-Stefan Gady, "Iran and Russia Negotiating \$10 Billion Arms Deal", *The Diplomat*, November 15, 2016, <https://thediplomat.com/2016/11/iran-and-russia-negotiating-10-billion-arms-deal/>. Accessed on May 8, 2018.

32. "Iran, Russia Building 2 Nuclear Power Plants in Bushehr", *Press TV*, November 1, 2017, <http://www.presstv.com/Detail/2017/11/01/540566/Iran-Russia-power-plants-Bushehr>. Accessed on December 28, 2017.

33. Nikita Smagin, "How Russia Managed to Double Its Exports to Iran in 2016", February 17, 2017, <https://www.rbth.com/business/2017/02/17/russia-exports-iran-704108>. Accessed on December 28, 2017.

34. Ibid.

\$1.5 billion.³⁵ However, one of the issues which still affects the trade relations is that Iranian traders cannot transfer money to Russia through the normal banking channels and the exchange rate of the *rial* against the *ruble* is not stable. Trade between Iran and Russia has always left much to be desired.³⁶ Low trade turnover indicators have remained as such for quite some time now. However, it is necessary to note that Russia's exports to Iran were always far bigger than those from Iran to Russia.

In January 2018, Iranian Foreign Minister Mohammad Javad Zarif met with his Russian counterpart Sergey Lavrov in Moscow to discuss the resolution of the Syrian civil war and US President Donald Trump's threats to suspend the nuclear deal with Iran.³⁷ After their meeting, Iranian Minister Zarif praised Russia's resolute support for the implementation of the Iran nuclear deal, and reiterated both countries' shared willingness to preserve the territorial integrity of Syria.³⁸ When Iranian President Hassan Rouhani visited Moscow in 2017, it was widely interpreted by the media and scholars as strengthening of the relationship between the two regional powers. Trade and economics, along with Russian investment in the Iranian energy sector, its involvement in Syria and the wider regional issues were undoubtedly high on the agenda.³⁹ Most of the Western scholars were describing the relationship between Iran and Russia as a strategic alliance.⁴⁰ At first glance, Russia's and Iran's close political relationship appears to be precipitated by the supportive role Moscow played in the Iranian nuclear negotiations. However, Iran's recent flexing of muscles in Syria and Yemen as an assertive regional power pursuing a nuclear programme was not acceptable to the

35. "Iran-Russia Ties Set To Expand", *Financial Tribune*, November 2, 2017, <http://financial.tribune.com/articles/economy-business-and-markets/75451/iran-russia-ties-set-to-expand>. Accessed on May 10, 2018.

36. "What is Behind Iran-Russia Weak Trade Ties?", *Azer News*, December 2, 2017, <https://www.azernews.az/region/123305.html>. Accessed on December 28, 2017.

37. Samuel Ramani, "How Strong is the Iran-Russia 'Alliance'?", *The Diplomat*, February 9, 2018, <https://thediplomat.com/2018/02/how-strong-is-the-iran-russia-alliance/>. Accessed on May 3, 2018.

38. *Ibid.*

39. "Russia, Iran Sign Economic Cooperation Deals", *Xinhua*, March 29, 2017, http://www.xinhuanet.com/english/2017-03/29/c_136165513.htm. Accessed on May 4, 2018.

40. Sekulow, n.1; Patrick Savage, "Russia and Iran's Alliance: Underestimated and Deepening" September 6, 2017, <https://www.americansecurityproject.org/russia-iran-alliance/>. Accessed on May 8, 2018.

Western policy-makers. It is to be seen as to what extent Iran is becoming, or already is, a regional hegemon that might strain the Russo-Iranian relations and challenge Russia's geopolitical power status. Therefore, it can be said that Iran's relations with Russia have fluctuated between the tactical and strategic which can be attributed to the regime in power in Iran and Russia's relations with the West. The conservative leader in power in Iran had leaned towards Russia for building a strategic partnership. Also, Iran's strained relations with the West have played a crucial role in this inclination.

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CHALLENGES TO THE RELATIONSHIP

Despite the avenues of cooperation, relations between Iran and Russia had been cautious also because of the Iranian rapprochement with the US. Additionally, there is always a hint of distrust between Iran and Russia, with Iran being wary of Russian dominance of power because of various historical instances between the two nations. The relations stand on clear limitations and, in certain circumstances, there has been tactical cooperation. Yet the increasing alignment between Moscow and Tehran on strategic issues seems to have nurtured the relations enough to withstand minor regressions, at least for the near future.

Despite cooperation in Syria and a boost in trade relations, the relationship between Russia and Iran remains more a marriage of convenience than a strategic alliance. Their relationship rests on a deep foundation of common strategic objectives and interests. The two countries are building a military coalition that can operate across the region—including a potential anti-access/area-denial zone stretching from the Mediterranean Sea to the Persian Gulf. Meaningful divisions between Moscow and Tehran will only materialise under extreme conditions when either or both are on the verge

of victory or collapse, forcing the other to make hard choices about its long-term regional interests. The foreseeable future offers little prospect of any such development. The increase of minor disagreements in Syria into opportunities that can split Russia-Iran ties seems like a distant futuristic possibility. This can also bring up a strategic surprise by a rising coalition—Iran and Russia—that is already altering the rules of the game in West Asia.

Strategic Convergence?: Russia and Iran view the European Union (EU) and NATO as tools of the US domination in Europe. Russia pressures NATO through continuous military exercises and violations of air space or territorial waters as well as occurrences against pro-Western governments, with Ukraine being the most notable example.⁴¹ Russia supports extremist political parties in Europe that seek to devolve power from the EU to national governments.⁴² Russia and Iran both seek to eliminate the US military presence in Iraq and Afghanistan. Iran also wants to maintain its influence in the region and, for the same reason, Tehran aims to prevent Iraq from becoming a hostile base of attack, remembering its eight-year-long war with Iraq under former Iraqi President Saddam Hussein. Tehran uses political parties and militias to pressure the weak government of Iraq periodically, meddling in its affairs by attempts at replacing it with a pro-Iranian leader who might order the US out of Iraq. Meanwhile, the Russian outreach in Iraq has been opportunistic.⁴³ Iran and Russia both also desire a stable buffer state in Afghanistan that excludes the US and NATO. Both countries prefer to work with the same set of allies on the ground within the Northern Alliance as well as the Afghan Taliban.⁴⁴ However, this seems like a difficult task due to the US presence and influence in the region.

Russia and Iran also have major economic interests in Turkey as a transit route for natural gas pipelines and a buyer of energy resources. Moscow and

41. Michael R. Gordon and Eric Schmitt, "Russia's Military Drills Near NATO Border Raise Fears of Aggression", *New York Times*, July 31, 2017, <https://www.nytimes.com/2017/07/31/world/europe/russia-military-exercise-zapad-west.html>. Accessed on May 10, 2018.

42. Matt Bradley, "Europe's Far Right Enjoys Backing from Russia's Putin", *NBC News*, February 12, 2017, <https://www.nbcnews.com/news/world/europe-s-far-right-enjoys-backing-russia-s-putin-n718926>. Accessed on May 10, 2018.

43. Stepanova, n.15.

44. Chris Kozak, "The Strategic Convergence of Russia and Iran", February 24, 2017, <http://www.understandingwar.org/backgrounder/strategic-convergence-russia-and-iran>. Accessed on December 28, 2017.

Tehran have chosen Turkey for diplomatic initiatives to end the Syrian civil war that exclude the US.⁴⁵ Both countries jointly took benefit of the tensions between the US and Turkey over coalition support for the Syrian Kurdish YPG, which Turkey considers to be an extension of the PKK (Kurdistan Workers' Party) (People's Protection Units). President Erdogan has expressed willingness to pursue membership of the Shanghai Cooperation Organisation (SCO), the rival to NATO, and led by Russia and China.⁴⁶

CONCLUSION

Relations between Iran and Russia converge on a number of issues related to the expansion of NATO, the spread of terrorism, destabilisation of the Central Asian and South Caucasian nations and rebuilding and stabilisation of Afghanistan. In all of this, the cooperation of the two nations on the Syrian issue is important. Though Iran and Russia have different perceptions about Syria and the West Asian region as a whole, they are clear on one thing: both do not want to see the region in chaos, torn apart by extremist groups of varying degrees of radicalism.

A promising area of cooperation emerging between Iran and Russia is oil and gas exploration, apart from military and technical cooperation. Russian military and civilian technology matters hugely to Iran. At the same time, Iranian markets can help the Russian industries. Both countries have been working together closely. Russian use of the Iranian Nojeh air base is the most significant example of cooperation between the two nations.

However, the situation can turn drastic if Tehran and Moscow are unable to work jointly. The instability and changing balance of power would sweep the region which can be disadvantageous to both Iran and Russia. Despite the fact that Tehran and Moscow have the same ideas on regional stability, combating terrorism, maintaining the regional balance of power and safeguarding territorial integrity, it seems that the Syrian crisis and the

45. Erin Cunningham, "Iran, Russia and Turkey Plan Syria's Future as Trump Seeks an Exit", *The Washington Post*, April 4, 2018, https://www.washingtonpost.com/world/iran-russia-and-turkey-meet-over-syrias-future-as-trump-mulls-troop-withdrawal/2018/04/04/c607e27c-3770-11e8-af3c-2123715f78df_story.html?noredirect=on&utm_term=.754fc3103b94. Accessed on May 10, 2018.

46. Kozak, n.44.

security collaboration between Iran and Russia would be the foundation to make strategic cooperation between the two states feasible. Definitely, Tehran-Moscow regional cooperation could be termed as strategic, due to the fact that both governments have been operationally and militarily cooperating in the fight against the Taliban in Afghanistan and the recent Syrian crisis in the name of confronting insecurity, establishing stability, and maintaining status quo in the region. There is no doubt that Russia and Iran, as a global and regional power, respectively, play a key role in forming and shaping the international system. For the time being, the military cooperation agreement focusses on deeper cooperation in the field of counter-terrorism, exchanges of military personnel for training purposes, and increase in the number of reciprocal visits by the Iranian and Russian leaders. Russia's stance *vis-à-vis* Iran is inherently connected to its relations with the Western world. Therefore, any change in NATO-Russia relations can lead to Moscow making an even stronger effort to improve ties with Tehran.

On the other hand, whether Iran will decide to overlook the minor obstacles in its relations with Russia and opt for a strategic partnership with Russia during the remaining three years of Hassan Rouhani's presidency largely depends on the policy that the US adopts in the region and, more specifically, towards Iran. For instance, the US decision to militarily intervene in Syria is likely to strengthen the Tehran-Moscow axis. This will also reinforce their partnership. At the same time, the reimposition of the sanctions by the US and its withdrawal from the Iranian nuclear deal will eventually drive Iran to look towards both Russia and China. The months ahead may mark a significant moment in the formation of the Iranian policy towards Russia for years to come.

CONNECTIVITY: A MAJOR CONSTRAINT IN INDIA'S ENGAGEMENT WITH CENTRAL ASIAN REPUBLICS

POONAM MANN

Economic interests play a vital role in determining relations among nations as economics is a major pillar of the foreign policy of any country. In the 21st century, 'economics' has been a key word that alludes not only to trade and commerce but also to the main roots of such trade and commerce. These are specifically called connectivity, infrastructure, institutions and people-to-people contacts. In fact, connectivity is the buzzword and many scholars in their writings have come up with profound statements when they claim that "competitive connectivity is the new arms race of the 21st century".¹ In order to gain, and expand, their markets, even countries that are disadvantaged in terms of distance, are looking for new ways to get connected.

Connectivity is not related only to physical linkages like roads, railways, bridges, etc. but has multiple facets that include the physical, cultural and social spheres. Strengthening connectivity across borders by facilitating seamless movement of goods, services, technology and people is the key to fostering economic growth. Connectivity is, therefore, how we make the

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1. Parag Khanna, "The New Arms Race: Connectivity and Competition", *Foreign Affairs*, February 15, 2016, at <http://www.foreignaffairs.com/articles/2016-02-15/new-arms-race>. Accessed on August 30, 2017.

Connectivity becomes an imperative issue in global geopolitics in general and Eurasian geopolitics in particular. The issue of various Silk Roads continues to determine the agenda of various regional and global powers, bringing in their own visions.

most of our geography. The global trends also indicate that connectivity and geography will affect the future of world affairs. Here, it must be taken into account that the main variable of any connectivity project is the 'route'. The concept of route is both "a geographical as well as a political idea", both "an end and a means" to create access.² Moreover, Jean Gottmann has commented that access in the geographical and political space has been "organised at all times in history to serve political ends and one of the major aims of politics is to regulate

the conditions of access."³ Thus, routes, access, geopolitical advantage and economic footage are all associated with each other and, hence, determine the strategic significance of any connectivity endeavour.

Thus, connectivity becomes an imperative issue in global geopolitics in general and Eurasian geopolitics in particular. The issue of various Silk Roads continues to determine the agenda of various regional and global powers, bringing in their own visions. For instance, the European Union (EU)-sponsored trade and transport corridor project TRACECA (Transport Corridor Europe-Caucasus-Asia) was the first such initiative taken in 1993. It was followed by the West sponsored Baku-Tbilisi-Ceyhan energy project; the EU-sponsored integrated energy pipelines project of the 'Southern Corridor'; the North Atlantic Treaty Organisation (NATO)-sponsored 'Virtual Silk Highway' project to connect European scientific-educational networks with Eurasia through the internet; the United Nations Economic and Social Commission for Asia and Pacific (UNESCAP) project on the Trans-Asian Railway Network (or the Iron Silk Road); the Central Asia Regional Economic Cooperation-Asian Development Bank (CAREC-ADB) project on trade and transport corridors in Afghanistan and Central Asia; the New Eurasian Land Transport Initiative

2. Mahnaz Z. Ispahani, *Roads and Rivals: The Politics of Access in the Borderlands of Asia* (London: I.B.Tauris, 1989), p.2.
3. Jean Gottmann, *The Significance of Territory* (Charlottesville: University of Virginia Press, 1973), p.27, as cited in Ibid.

by the International Road Transport Union; the US-sponsored New Silk Road Initiative (NSRI) and the project to transform the NATO-sponsored Northern Distribution Network (NDN) system across Europe to convey non-lethal supplies to Afghanistan into permanent transport corridors across Eurasia;⁴ China, promoting its Belt-Road Initiative (BRI), also known as One Belt One Road (OBOR); and Russia advancing its Moscow-centric 'Greater Eurasia' project.

In this Eurasian geopolitics, the Central Asian region serves as an important crossroads between Europe and Asia because of its geostrategic location in the heart of Eurasia. In fact, goods and services have flowed across the region since ancient times, connecting Europe, China and West Asia, thus, establishing many trade hubs. In modern times, the region has once again become the site of the geopolitical and geoeconomic interests of various external powers. These landlocked republics border Iran and Afghanistan to the south, China to the east and Russia to the northwest. This strategic location and their energy resources make them increasingly important in the geostrategic great game. Traditionally, Central Asia has been an arena of the great game where Russia and Great Britain vied for dominance. In modern times, the great game is being played out by multiple global powers such as Russia, China, Japan and the US. Regional powers such as Turkey, Iran, Pakistan and Afghanistan also play a crucial role in this great game because of their substantial security and economic interests in the region.

Though all these external powers acknowledge the poor state of the Central Asian infrastructure, along with investments, they are bringing their own visions of state-building and regional integration. For instance, China

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4. Sreemati Ganguli, "India's Strategic Connect with the World", <http://idsa.in/idsacomments/india-strategic-connect-with-the-world-sganguli.231017>. Accessed on October 24, 2017.

is promoting various developmental projects in these republics in order to connect them with its underdeveloped and restive province of Xinjiang; Russian attempts to integrate them in its new regional organisations are aimed at keeping these republics away from the West, and the US attempts to create connections between Central Asia and South Asia or with Europe are aimed to bypass Russia. On the other hand, the Central Asian Republics (CARs) are increasingly looking towards these powers for their investment in infrastructural projects in the region and to gain access to international markets. Such opportunities will help them to get out of their landlocked position to being landlinked to the world's great and dynamic economies.⁵ India is no exception to this. Unfortunately, the absence of direct physical access has been a major stumbling block in India's relations with Central Asia. The tough geopolitical neighbourhood has further hampered India's reach into the region. Consequently, despite having close historical, civilisational and cultural linkages, the relationship between India and the CARs has not developed up to the mark. However, the current trend in India's foreign policy approach suggests a more coordinated effort to treat connectivity as a strategy in the regional, inter-regional and global arenas.

Therefore, the present paper, in this scenario, analyses connectivity as one of the major challenges for India to engage the CARs. It also analyses various opportunities and possibilities that India needs to explore to connect with the Central Asian region. Prior to such an exercise, it is imperative to discuss various connectivity projects that the CARs are involved in and India's chances of benefiting from them.

AN OVERVIEW OF THE CARs AND THE CONNECTIVITY PROJECTS

Twenty-five years since their independence, the following features are noteworthy in the Central Asian Republics:

- The region and the republics have been stable in spite of security, economic and social challenges faced by them.

5. Johannes F. Linn, "Central Asian Regional Integration and Cooperation: Reality or Mirage?", <https://www.brookings.edu/wp-content/uploads/2016/06/10-regional-integration-and-cooperation-linn.pdf>. Accessed on August 27, 2017.

- The region has grown to be an important geostrategic ally because of its location in the heart of Eurasia and the opportunities it has provided to the international actors.
- The republics have been able to maintain fairly good neighbourly relations along their borders, keeping an eye on unlocking the regional transport arteries.
- The perceived aim of investments in the energy and transport infrastructure among the CARs has proved to be a way to revitalise the regional economies. Therefore, improving the infrastructure is a shared goal among the CARs.

Hence, the reconnection of the Central Asian region with the rest of the world in terms of transportation or in terms of restoring the 'silk way' is considered as nothing less than a revolution.⁶ For attaining their shared objective, the dynamics of the relations among the republics of the region are changing from tensed to welcoming.⁷ As a part of their multi-vector policy, they are developing their own concept of cooperation with the international community in the transport sector, as given below.

BELT AND ROAD INITIATIVE (BRI)

The BRI promises the Central Asian region's integration with a new and multifaceted transportation network, and, thus, connecting it to distant countries and markets. It is also viewed as changing Central Asia from a landlocked to a transit region and, thus, creating a new direction in its development. Hence, all the Central Asian leaders have given their wholehearted support to this Chinese-led initiative.

The Belt and Road Initiative (BRI), the flagship programme of Chinese President Xi Jinping, made headlines on May 14-15, 2017, when delegates from over 110 countries and a number of organisations attended the event. The highlight of the event was the participation of 29 heads of states or governments,

6. Georgi Gotev, "Kazakh Minister: Two 'Revolutionary' Stories are Happening in Central Asia", <http://www.euractiv.com/section/central-asia/interview/two-revolutionary-stories-are-happening-in-central-asia/>. Accessed on September 1, 2017.

7. Ibid.

The BRI, basically, refers to the land-based “Silk Road Economic Belt” and the sea-going “21st Century Maritime Silk Road”, that was proposed by President Xi Jinping in 2013 during his visit to Kazakhstan and Indonesia. These aim to connect Asia, Africa and Europe along five routes.

representing their countries, from Asia, Africa, Europe, and South America. They signed the joint communique affirming that the “spirit of peace, cooperation, openness, transparency, inclusiveness, equality, mutual learning, mutual benefit and mutual respect by strengthening cooperation on the basis of extensive consultation and the rule of law, joint efforts, shared benefits and equal opportunities for all” shall be pursued in order to build synergies in development strategies.⁸ The presidents of three republics of Central Asia i.e. Kazakhstan, Kyrgyzstan

and Uzbekistan were also among the attendees and signatories to the joint communique. They expressed their support and optimism towards the potential for projects beyond infrastructure and opening new opportunities in the region. The enthusiasm was quite visible as Kazakhstan’s President Nursultan Nazarbayev, while speaking at the forum said, “Xi’s idea to restore the ancient Silk Road in Eurasia in a modern format is a timely response to the increased political, economic and humanitarian crisis in the world... the implementation of the Silk Road initiative allows to position the whole region in a new way, including Central Asia in a global context,”⁹

The BRI, basically, refers to the land-based “Silk Road Economic Belt” and the sea-going “21st Century Maritime Silk Road”, that was proposed by President Xi Jinping in 2013 during his visit to Kazakhstan and Indonesia. These aim to connect Asia, Africa and Europe along five routes. The Silk Road Economic Belt focusses on:

- Linking China to Europe through Central Asia and Russia.
- Connecting China with West Asia through Central Asia.

8. “Joint Communique of the Leaders Roundtable of the Belt and Road Forum for International Cooperation”, May 16, 2017, Ministry of Foreign Affairs of the People’s Republic of China, http://www.fmprc.gov.cn/mfa_eng/zxxx_662805/t1462012.shtml. Accessed on August 12, 2017.

9. Malika Orazgaliyeva, “Kazakh President Attends One Belt, One Road Forum, Meets With Leaders in China”, *The Astana Times*, May 16, 2017.

- Bringing together China and Southeast Asia, South Asia and Indian Ocean.

The 21st Century Maritime Silk Road focusses on:

- Using Chinese coastal ports to link China with Europe through the South China Sea and Indian Ocean.
- Connecting China with the South Pacific Ocean through the South China Sea.¹⁰

Therefore, the main attention would be given to building roads, ports, railways, telecom, etc. to enhance trade and business.

Under the BRI, six economic corridors are proposed to be developed:

- The New Eurasia Land Bridge Economic Corridor.
- The China-Mongolia-Russia Economic Corridor.
- China- Central Asia-West Asia Economic Corridor.
- China-Pakistan Economic Corridor.
- Bangladesh-China-India-Myanmar Economic Corridor.

President Xi Jinping's ambitious project will cover areas like policy coordination, connectivity, infrastructure development, trade facilitation, investments and people-to-people contacts. The routes will cover more than 60 countries and regions, touching about 60 percent of the world's population.¹¹ From its outlook and the official position presented by the Chinese authorities, it appears that the BRI is mainly an economic initiative aiming at socio-economic benefits and comprises win-win cooperation for all the participants. However, one must remember that this initiative is central

President Xi Jinping's ambitious project will cover areas like policy coordination, connectivity, infrastructure development, trade facilitation, investments and people-to-people contacts. The routes will cover more than 60 countries and regions.

10. "The Belt and Road Initiative" Hong Kong Trade Development Council (HKTDC), September 13, 2017, <http://china-trade-research.hktdc.com/business-news/article/The-Belt-and-Road-Initiative/The-Belt-and-Road-Initiative/obor/en/1/1X000000/1X0A36B7.htm>. Accessed on September 29, 2017.

11. "The Belt and Road Initiative: A Road Map to The Future", Hong Kong, Trade Development Council (HKTDC), <https://beltandroad.hktdc.com/en/belt-and-road-basics>. Accessed on September 1, 2017.

to Xi Jinping's "Chinese Dream"¹² and the new Silk Road is at the heart of his nationalist vision. Therefore, it is not free from China's geostrategic, economic and political interests. By funding and building transport infrastructure, power grids, pipelines, etc. China is flexing its economic muscles with an aim to weave a web of economic dependency and draw the smaller and least developed countries into its tight embrace. Moreover, the BRI also offers China a way to give a boost to its economy, pursue development into its western region, open up new markets and strengthen links with resource rich countries and, thus, expand its political clout as well.¹³

SIGNIFICANCE OF THE CENTRAL ASIAN REPUBLICS TO BRI

The Central Asian region is a key component in the BRI and is ideally placed to benefit the international sphere primarily for two reasons. Firstly, all the five republics of the region are imperative to the land component i.e. Silk Road Economic Belt, of the BRI project. The New Eurasia Land Bridge Economic Corridor and China-Central Asia-West Asia Economic Corridor are of particular relevance in this context. Besides, the Khorgos-Aktau Railway project is another important link.¹⁴ The region physically connects China with Europe and West Asia and also acts as China's gateway to the West. Secondly, China has a significant and substantial stake in the region. This is mainly because Central Asia neighbours its troubled Xinjiang Uighur Autonomous Region (XUAR), where a segment of the ethnic Uighur population continues to strive for independence. Further, China, being a net importer of oil, wants assured access to Central Asia's vast oil and gas resources. In addition, it seeks to develop new markets for its exporters and construction companies by building roads and railways across this

12. Pepe Escobar, "Xi's Roadmap to the Chinese Dream", *Asia Times*, October 21, 2017, www.atimes.com/article/xis-road-map-chinese-dream/. Accessed on October 30, 2017.

13. Mark Magnier, "Beijing Spins a Web of Chinese Infrastructure", *The Wall Street Journal*, January 16, 2017, www.wsj.com/articles/Beijing-spins-a-web-of-chinese-infrastructure-1484560801. Accessed on January 17, 2017.

14. For details, see "Kazakhstan: A Modern Silk Road Partner", <http://hkmb.hktdc.com/en/IX0A50Y2/HKTD-Research/Kazakhstan-A-Modern-Silk-Road-Partner#>. Accessed on October 12, 2017.

landlocked region of the world.¹⁵ Hence, when President Xi Jinping first laid out his vision for the BRI [One Belt One Road (OBOR) at that time] in 2013, with an offer of multi-billion dollar investment in transport and industry and a vision of free trade across the region, Astana (Kazakhstan) was an appropriate venue—symbolically as well as geographically.

In the past, China has made concerted efforts to forge closer relations with the CARs. Over the years, it has emerged as the leading trade partner and investor not only in the energy sector but in infrastructure of all types (pipelines, hydropower plants, bridges, tunnels, roads, railways, etc.). It has also refurbished oil refineries and has completed major oil and gas pipeline projects. Further, the Chinese have invested heavily in the extraction of the region's natural resources, especially oil, gas, uranium, gold and copper, as they make up the main exports of the region. China is also the region's main external creditor and has extended loans to all the republics during financial crises,¹⁶ thus, becoming a strong pillar of influence in the region. Additionally, China appears to be a successful political model for the Central Asian authoritarian states, a nation that is able to combine economic growth and a system based on strongly centralised political and social control. As a result of Central Asia being the central location of major Belt routes, China's economic and security interests in the region will only increase.

The CARs, on the other hand, after their independence, inherited a huge management crisis i.e. problems of inflation, economic development, job creation, foreign policy, security, etc. The region was enmeshed in Soviet era networks of electricity grids, oil pipelines, railways, roads, etc. to serve the needs of the Russian hub of the Soviet economy. The intra-Central Asian linkages and infrastructure remained underdeveloped. Moreover, their view of the outside world was also dependent on Moscow.¹⁷ Further,

15. Shiping Tang, "Economic Integration in Central Asia – The Russian and Chinese Relationship," *Asian Survey*, vol. XL, no. 2, March-April 2000, p.365.

16. For details, see Alexander Cooley, "The Emerging Political Economy of OBOR: The Challenges of Promoting Connectivity in Central Asia and Beyond", Centre for Strategic and International Studies, Washington DC, October, 2016, <http://csis.org/analysis/emerging-political-economy-obor>. Accessed on August 12, 2017.

17. For details see, Ahmed Rashid, *Jihad: The Rise of Militant Islam in Central Asia* (Hyderabad: Orient Longman Private Limited, 2002).

Chinese-led infrastructural development is changing the map of the region. China has already built pipelines from Kazakhstan and Turkmenistan. The Chinese funded railway project was opened between Uzbekistan and Ferghana in 2016.

all the CARs are landlocked economies and were heavily dependent on extracting natural resources like oil and gas. They were also keen to get out of their overdependence on Russia and diversification was essential to realise the vision that they wanted to advance. Hence, all the republics developed a robust relationship with China which aided their economic growth in the post-Soviet era. In fact, Chinese-led infrastructural development is changing the map of the region. China has already built pipelines from Kazakhstan and Turkmenistan. For instance, the China-Central

Asia gas pipeline traversing Turkmenistan, Uzbekistan and Kazakhstan became operational in 2009, and the China-Kazakhstan oil pipeline, which runs from Kazakhstan's Caspian shore to Xinjiang in China and was built in segments, has also been completed and functional. The Chinese funded railway project was opened between Uzbekistan and Ferghana in 2016. The railway line will pass through Tajikistan, connecting Ferghana Valley with the rest of Uzbekistan. Another landmark initiative from the Belt-Road perspective is the East-West bound Khorgos-Aktau Railway link which is a trans-Kazakhstan railway line from the Caspian Sea port-city of Aktau (Kazakhstan) to the logistics hub of Khorgos (China's border).¹⁸ From Aktau, shipping will offer transport across the Caspian to Azerbaijan and Georgia, and a link to the recently inaugurated Baku-Tbilisi-Kars railway line.¹⁹ Alternatively, the Kazakhstan-Turkmenistan-Iran railway link, which was inaugurated in December 2014, can be used. Also, this route will completely

18. Wade Shepard, "A Look Inside Aktau, Kazakhstan's Other Hub On The New Silk Road", <http://www.forbes.com/sites/wadeshepard/2017/04/15/a-look-inside-aktau-kazakhstans-other-hub-on-the-new-silk-road/>. Accessed on September 12, 2017.

19. Dunamali Emiroglu Veliyev, "The New Stage of Integration Processes in Eurasia: The Baku-Tbilisi-Kars Railway Project", <http://eurasian-research.org/en/research/comments/transport/new-stage-integration-proceses-eurasia-baku-tbilisi-kars-railway-project/>. Accessed on August 8, 2017.

bypass Russia.²⁰ Further, there is a proposal to revive the building of a high speed railway link between China-Kyrgyzstan and Uzbekistan.

Along with trade and connectivity, China has given due importance to investment in the industry and power sectors also. For instance, in Kyrgyzstan a Chinese-run cement plant is operating in Aravan, with others announced for Issykul and Osh. In Tajikistan, Chinese investors have established many cement plants, and a Chinese company, Tebian Electricity Apparatus (TBEA), completed the \$350 million reconstruction of the Dushanbe power plant in December 2016 and is refurbishing the Bishkek power and heating plant. It has also completed a \$390 million electricity transmission line between north and south Kyrgyzstan.²¹ By these huge investments, China has succeeded in consolidating its geopolitical influence in the region. Pantucci Raffaello has rightly observed, "The decision to first focus the initiative on Central Asia was a reflection of the fact that the region served as a conduit for China's decades-long approach to investment around the world...with a model of building infrastructure using Chinese firms deployed to deliver on loans provided by the country's financial institutions to open up trade and markets, Beijing's investments in Central Asia since the end of the Cold War provide a model for the globalised Belt and Road Initiative".²²

Therefore, it is believed that, after the inception of the BRI, China's role/ investments will grow substantially in the region. So, the active support and enthusiasm from the leadership of three of the CARs during the BRI Summit was understandable. In fact, a number of agreements were signed between the CARs and China during that time. Some of these include:

- Agreements on international transportation and strategy coordination with Uzbekistan.
- Economic and trade cooperation agreements with Uzbekistan and Tajikistan.

20. Onur Uysal, "Kazakhstan-Turkmenistan-Iran Railway To Open Today", <http://railturkey.org/2014/12/03/Kazakhstan-turkmenistan-iran-railway>

21. "Central Asia's Silk Road Rivalries", Report No. 245/Europe and Central Asia, July 27, 2017, <http://www.crisisgroup.org/europe-central-asia/central-asia/245-central-asian-silk-road-rivalries>. Accessed on July 28, 2017.

22. Pantucci Raffaello, "China: Understanding Beijing's Belt and Road Initiative", <https://rusi.org/commentary/china-understanding-beijing-s-belt-and-road-initiative>. Accessed on July 28, 2017.

- The National Development and Reform Commission of China signed the Memorandum of Understanding on Promoting the Major Projects under Industrial Capacity and Investment Cooperation with the Ministry of Economy of Kyrgyzstan.
- Customs cooperation agreement with Kazakhstan.
- Chinese telecom companies' participation in the "Digital Kazakhstan 2020" programme.
- Agreement on education cooperation with Kazakhstan.
- Tourism cooperation agreement with Uzbekistan.²³

Besides these agreements, reportedly, the Uzbek and Kyrgyz presidents were also keen to include the China-Kyrgyzstan-Uzbekistan Railway projects (that have been stalled for years) under the Belt and Road initiatives. Also, Kyrgyz President Atambayev actively talked about the "Digital Silk Road" of Eurasia and his country's potential role as a key logistic hub. On the other hand, the Kazakh president was anxious about the long-term benefits of the initiative.²⁴ Probably, the leaders of the region have realised that dependence on hydrocarbon resources cannot take them further but infrastructural development can. The President of Uzbekistan, Shavkat Mirziyoyev, while speaking at the BRI Summit clearly stated that the BRI should be filled with "concrete programs and regional development projects... We urge for major transport, trade, investment, energy and high-tech projects to be implemented in our region, which has rich natural, industrial and human resources,... the second key issue is the development of a comprehensive cooperation program for creating transport and logistics routes linking Europe, Central Asia through China and Russia to the markets of South and Southeast Asia."²⁵

The BRI project looks promising and will clearly benefit the Central Asian Republics economically. It will aid the republics in not only gaining an international outreach but also developing greater diplomatic connections

23. Ganguli, n.4.

24. Catherine Putz, "What's Next for the Belt and Road in Central Asia", *The Diplomat*, May 17, 2017, <https://thediplomat.com/2017/05/whats-next-for-the-belt-and-road-in-central-asia/>. Accessed on October 12, 2017.

25. "Remarks by Shavkat Mirziyoyev at Leaders' Roundtable Summit at Belt and Road Forum", *The Tashkent Times*, May 15, 2017.

with more countries. However, this project is still in its initial stages and its future course is uncertain and ambiguous. In addition, the CARs are wary of the extent of Chinese involvement as it might threaten their sovereignty and violate their territorial integrity. Consequently, the CARs are not keeping all their eggs in one basket and are also expanding towards other horizons.

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THE OTHER HORIZONS

As a part of their multi-vector policy, the CARs are developing their own concept of cooperation with the international community in the transport sector. For instance, Turkmenistan is putting in a lot of effort to emerge as a transport hub. Its favourable geographical location is strengthening its position as a major transit and transport junction point of regional and continental significance. The Kazakhstan-Turkmenistan-Iran Railway link, that was inaugurated in December 2014, is worth mentioning here. It also intends to commission the region's largest road and rail bridges across the Amu Darya river, connecting the transport hubs of Uzbekistan and Turkmenistan and, thus, speeding up traffic flow in both directions.²⁶ Further, the Turkmenistan-Afghanistan-Tajikistan Railway project is in the making, but Turkmenistan has already completed its section with Afghanistan and opened its completed railway link on November 28, 2016.²⁷ Turkmenistan is also a part of the Central Asia-Persian Gulf Transport Corridor. Uzbekistan, along with Turkmenistan, Qatar and Oman, is a part of this agreement which came into force in April 2016.²⁸ Besides, the

26. Elchin Huseynov, "Turkmen Transport Strategy is of Long-Term Nature: President", *Trends News Agency*, November 26, 2016, <https://en.trend.az/casia/turkmenistan/2690208.html>. Accessed on September 20, 2017.

27. Shoaib Ahmad Rahim, "The Turkmenistan-Afghanistan-Tajikistan Railway" *The Diplomat*, December 9, 2016, <https://thediplomat.com/2016/12/the-turkmenistan-afghanistan-tajikistan-railway/>. Accessed on September 20, 2017.

28. Demir Azizov, "Agreement on Central Asia- Persian Corridor Enters Into Force", *Trends News Agency*, April 23, 2016, <https://en.trend.az/business/economy/2524083.html>. Accessed on September 20, 2017.

Russia, which considers the Central Asian region as its strategic backyard, has outlined an ambitious vision of a new global integration grouping on top of the already existing economic and political unions in Eurasia.

Turkmen president also inaugurated a new cargo and passenger seaport on the Caspian Sea in May 2018, in order to strengthen its economy by handling shipping traffic between Asia and Europe.²⁹

Clearly, the CARs are striving to develop their own transport infrastructure. The state programmes of the transport sector development have been adopted in all the five Central Asian Republics with an aim to open access to international trade routes.³⁰

Although there are a lot of connectivity projects that aim to connect the CARs, Russia's pivotal role cannot be undermined as the heavy dependence of the CARs on Russia in terms of security is still evident. Also, Russia, which considers the Central Asian region as its strategic backyard, has outlined an ambitious vision of a new global integration grouping on top of the already existing economic and political unions in Eurasia. As per President Putin's new vision, the Russian-led Eurasian Economic Union (EEU) can become part of a larger integration entity, a "Greater Eurasia." This Greater Eurasian partnership could also include China, India, Pakistan and Iran, the former Soviet states and other interested parties. The Greater Eurasian partnership will aim at developing trade, reducing and, eventually, removing, tariff barriers between the participating countries.³¹ The idea of Greater Eurasia and increased integration between the EEU and EU, was strongly supported by Kazakh President Nazarbayev.

The EEU is a Eurasian integration project led by Russia. Besides Russia, Kazakhstan, Belarus, Armenia and Kyrgyzstan are the other member states

29. Aygerim Sarymbetova, "Turkmenistan Launches New Seaport", <http://caspiannews.com/news-detail/turkmenistan-launches-new-seaport-2018-5-5-38/>. Accessed on May 8, 2018.

30. Aset Ordabayev, "The Geopolitics of Transport Corridors in Central Asia", Working Paper, June 2015, The Institute of World Economics and Politics (IWEP) under the Foundation of the First President of the Republic of Kazakhstan, http://iwep.kz/files/attachments/article/2015-07-05/geopolitics_of_transport_corridors_in_central_asia.pdf. Accessed on September 20, 2017.

31. Sergei Blagov, "Russia Eyes Greater Eurasia", *Asia Times*, June 20, 2016, <http://www.atimes.com/article/russia-eyes-greater-eurasia/>. Accessed on July 30, 2017.

of this project. For more than 20 years in the post-Soviet era, the idea had been prevalent to have some sort of single economic space among the newly independent states. President of Kazakhstan Nursultan Nazarbaev, first spoke about it during a speech at Moscow State University in 1994 . Later the idea developed further with the formation of the Eurasian Economic Community in 2000, which aimed at providing a common legal framework for energy markets and free movement of labour. To further develop the integration process among the Commonwealth of Independent States (CIS), the Customs Union was formed by Russia, Belarus and Kazakhstan in 2010.

The EEU is the logical continuation of the Customs Union, comprising additional steps towards economic integration through unification of labour and trade legislation as well as the harmonisation of the legal framework in other areas.³² Finally, on January 1, 2015, Russia, Kazakhstan and Belarus came together to launch the EEU. Armenia officially joined the next day and Kyrgyzstan in August 2015. Tajikistan has also shown interest in joining the Union, but Uzbekistan and Turkmenistan have not shown any such inclination.

So far, the EEU has not been considered a success story as it has not been able to provide an economic boost which the member states have expected, except for the migrated labour force to Russia from the Central Asian Republics. Therefore, how the idea of creating a Greater Eurasia will work out is a question mark.

Further, Russia and China have joined an agreement on collaboration between the EEU and Silk Road Economic Corridor in May 2015. But the prospects of true partnership seem a distant reality as their visions for Eurasia

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32. Gulaikhan Kubayeva, " Economic Impact of the Eurasian Economic Union on Central Asia", Central Asia Security Policy Brief, February 2015, OSCE Academy in Bishkek, http://osce-academy.net/upload/file/policy_brief_20.pdf. Accessed on July 25, 2017.

in general and Central Asia in particular do not match. So, the futuristic outlook of these visions also remains unexplained.

From the above discussion, it is evident that by joining various connectivity projects, the CARs are trying to move towards progress by balancing out the domination of a single power in their region. Does India fit into these projects in any manner? If not, then, how India will make its place in the region in the present scenario needs due attention.

INDIA'S BLUEPRINT FOR CONNECTIVITY

The establishment of the India-Afghanistan Air Freight Corridor and the first flight taking off from Kabul for New Delhi on June 19, 2017, and connecting two more cities of Afghanistan (Mazar-e-Sharif and Herat) to New Delhi by air clearly marked a decisive step towards the promotion of connectivity as one of the strategic dimensions of India's foreign policy. "The connectivity established through the Air Freight Corridor will provide Afghanistan, a landlocked country, greater access to markets in India, and will allow Afghan businessmen to leverage India's economic growth and trade networks for its benefits...", said Mr. Deepak Mittal, the Joint Secretary (Pakistan, Afghanistan and Iran).³³ This is just one example of India's connectivity endeavours as it has been the global trend to foster connectivity among states and regions. Similar intentions were visible during the joint declaration on the Asia-Africa Growth Corridor (AAGC) or the Freedom Corridor, issued at the 52nd annual meeting of the African Development Bank in May 2017 and its subsequent reiteration in the India-Japan Joint Statement during the Japanese prime minister's visit to India in September 2017. The AAGC Vision Document states that the initiative will concentrate on development and cooperation; infrastructure, digital and institutional connectivity; skill development and establishment of people-to-people contacts among Africa, South Asia, East and Southeast Asia and Oceania.³⁴ Further, India also initiated the India-Myanmar-Thailand Highway project,

33. "Maiden India-Afghanistan Air Freight Corridor Lands in Delhi", *Deccan Chronicle*, June 19, 2017, <http://www.deccanchronicle.com/nation/currentaffairs/190617/maiden-india-afghanistan-air-freight-corridor-carrying-afghan-goods-lands-in-delhi.html>. Accessed on October 5, 2017.

34. Ganguli, n.4.

to be extended to Cambodia, Lao PDR and Vietnam. The project is known as the East-West Economic Corridor and provides greater economic viability to the India-ASEAN strategic partnership. All these initiatives suggest that India is making concerted efforts to develop connectivity as a strategy in the regional and global arenas. Furthermore, India's decision to join the International Roads Transport (TIR) Convention as the 71st signatory shows its seriousness about getting involved in the international transport architecture and connectivity network.³⁵

The INSTC—considered as India's gateway to expand trade and investment links with the Central Asian Republics and Eurasia—is a multi-modal transportation route that links the Indian Ocean and Persian Gulf to the Caspian Sea via Iran and onwards to northern Europe via St. Petersburg in Russia.

Similarly, India is also seeking a strong connectivity network with the Central Asian Republics, which it considers its extended neighbourhood. Unfortunately, India does not share physical borders with these republics and the tough neighbourhood has further hampered its reach to the region. India's connectivity with the CARs is restricted by the Himalayas in the north and hostile relations with Pakistan in the west. Consequently, trade and economic relations have remained minimal between India and the CARs. Therefore, in an attempt to redeem the situation, India has sought new avenues. One of these is to enhance its engagement with regional and multilateral initiatives. The second avenue is to have close cooperation with friendly countries like Russia, Iran and Afghanistan, around the region.

In fact, the last couple of years have seen some major strategic breakthroughs in this direction. For instance, Indian Prime Minister Narendra Modi's visit to all the five CARs in July 2015 and to Iran in May 2016, brought the focus on connectivity and trade. Trade and transit issues were high on Modi's agenda. While interacting with the presidents of these republics, on a bilateral basis, he stressed on the need for deepening infrastructure links.

35. Indrani Bagchi, "India Joins UN TIR Convention", *The Times of India*, June 19, 2017, <https://timesofindia.indiatimes.com/india/india-joins-un-tir-convention/articleshow/59220976.cms>. Accessed on October 10, 2017.

Hence, the emphasis was on speeding up the work on the International North-South Transport Corridor (INSTC), Iran-Turkmenistan-Kazakhstan (ITK) rail link, India's interests in joining the Ashgabat Agreement, and India's investment in Chabahar port.

INTERNATIONAL NORTH-SOUTH TRANSPORT CORRIDOR (INSTC)

The INSTC—considered as India's gateway to expand trade and investment links with the Central Asian Republics and Eurasia—is a multi-modal transportation route that links the Indian Ocean and Persian Gulf to the Caspian Sea via Iran and onwards to northern Europe via St. Petersburg in Russia. It envisages movement of goods from Mumbai (India) to Bandar Abbas (Iran) by sea, from Bandar Abbas to Bandar-e Anzali (an Iranian port on the Caspian Sea) by road and then from Bandar-e Anzali to Astrakhan (a Caspian port in the Russian Federation) by ship across the Caspian Sea, and thereafter from Astrakhan to the other regions of the Russian Federation and further into Europe by Russian railways. The INSTC project was initiated by Russia, Iran and India in September 2000, in order to establish a transportation network among the member states and enhance connectivity with the landlocked CARs. Later, it was joined by another 11 countries, namely: Armenia, Azerbaijan, Kazakhstan, Kyrgyz Republic, Tajikistan, Turkey, Ukraine, Belarus, Oman, Syria and Bulgaria (as observer).³⁶ The progress on this project, however, had been very slow in the past. But, in 2014, for understanding the problem areas and to realise the full potential of the corridor, a dry run was conducted by the Federation of Freight Forwarders' Association in India (FFFAI), on the Nhava Sheva-Bandar Abbas (Iran)-Baku (Azerbaijan) and the Nhava Sheva-Bandar Abbas-Amirabad (Iran)-Astrakhan (Russia) route via the Caspian Sea. The dry run report pointed out that "the proposed INSTC route via Bandar Abbas in Iran to Russia and CIS³⁷ destinations in transit through Iran could be the best route with

36. "International North-South Transport Corridor" (INSTC), www.instc.org.ir/pages/home_Pages.aspx. Accessed on October 20, 2016.

37. CIS Stands for Commonwealth of Independent States

optimal transit/ cost for the Indian exporters/ importers³⁸." Further, in 2015, the officials from India, Iran, Russia and the other 11 countries had a meeting in New Delhi and approved draft transit and customs agreements for INSTC. This will provide the legal framework for moving freight on the ship-rail-road route linking India, Iran, Russia, CARs and Europe³⁹.

To operationalise this project, India is making attempts to fill in the missing links, with cooperation from the CARs. During the prime minister's visit to Kazakhstan in July 2015, India agreed on increased collaboration in the framework of the INSTC and agreed that the Kazakhstan-Turkmenistan-Iran (KTI) rail link, operationalised in December 2014, becomes a linked corridor of the INSTC⁴⁰. The route links the Caspian Sea to the Indian Ocean through the Bandar Abbas and Chabahar ports in Iran. Also, Kazakhstan's national railway company, Kazakhstan TemirZholy (KTZ) signed a Memorandum of Understanding with Special Economic Zone (SEZ) Adani Ports for building a port in Mundra (Gujarat). The importance of this port lies in the fact that once the link between Mundra port and Bandar Abbas is ready, the goods can be transported via the KTI rail link and this will be shorter and cheaper.⁴¹ With Uzbekistan, the prime minister sought its support for joining the Ashgabat Agreement – a transit pact established in 2011 by Iran, Oman, Qatar, Uzbekistan and Turkmenistan to develop trade and transport with Iranian and Omani ports.⁴² The land component of the agreement includes rail links through Kazakhstan-Uzbekistan-Turkmenistan and Iran. However, Qatar withdrew from the agreement in 2013, and now Kazakhstan has joined it. Accession to the agreement

38. "International North-South Transport Corridor (INSTC)-Dry Run Report 2014",commerce.nic.in/publications/INSTC-Dry-run-report-Final.pdf. Accessed on October 20, 2016.

39. Dipanjan Roy Choudhary, "INSTC Draft Approval: Big Step Forward on India-Iran-Russia Corridor", economictimes.indiatimes.com/news/politics-and-nations/institc-draft-approval-big-step-forward-on-india-iran-russia-corridor/articles/ow/48766349.cms. Accessed on October 20, 2016.

40. "Tej Kadam: India-Kazakhstan Joint Statement," mea.gov.in/outgoing-visit-detail.htm?/Tej+Kadam+India+Kazakhstan+joint+statement. Accessed on May 12, 2016.

41. "Kazakhstan eyes Terminal at Mundra to Give Fillip to Bilateral Trade", www.thestatesman.com/news/business/Kazakhstan-eyes-terminal-at-mundra-to-give-fillip-to-bilateral-trade/106535.html. Accessed on October 19, 2016.

42. "India-Uzbekistan Ink Pacts to Boost Cooperation", *The Hindu*, July 7, 2015, www.thehindu.com/news/national/prime-minister-narendra-modi-visit-to-uzbekistan/article/7392482.ece. Accessed on May 12, 2016.

India's active collaboration to develop the Iranian seaport of Chabahar also underscores a paradigm shift in India-Central Asia relations. The bilateral agreement will provide India the right to develop and operate two terminals and five berths with multi-purpose cargo handling capacities in the port of Chabahar for ten years.

would enable India to utilise this existing transport and transit corridor to facilitate trade and commercial interaction with the Eurasian region⁴³ and would synchronise India's efforts to implement the INSTC for enhanced connectivity.

CHABAHAR PORT AND INDIA-CENTRAL ASIA RELATIONS

India's active collaboration to develop the Iranian seaport of Chabahar also underscores a paradigm shift in India-Central Asia relations. The bilateral agreement will provide India the right to develop and operate two terminals and five berths with multi-purpose cargo handling capacities in the port of Chabahar for ten years. Also, the Trilateral Transport and Transit corridor agreement between India- Iran- Afghanistan, which will connect Chabahar with the Afghan road and rail network⁴⁴ is being considered as India's strategic connectivity endeavour⁴⁵. The trade and transit corridor agreement will enable India to establish connectivity with Afghanistan, bypassing Pakistan, and further into Central Asia for the development of INSTC. Chabahar would be connected to Milak, close to the Afghan border and into Afghanistan through the Indian built Zaranj-Delaram highway. This section is a part of the broader INSTC project that links Eurasian nations, from Russia in the north and India in the south through Central Asia.

43. "India to Accede to Ashgabat Agreement", <http://.pib.nic.in/newsite/printrelease.aspx?relid=138309>. Accessed on May 12, 2016.

44. "India to Develop Iran's Chabahar Port", www.thehindu.com/news/national/india-to-develop-irans-chabahar-port/article8637558.ece. Accessed on October 19, 2016.

45. Monish Gulati, "India-Iran Agreement on Chabahar is a Strategic Opportunity- Analysis", *Eurasia Review*, www.eurasia.review.com/110622016-india-iran-agreement-on-chabahr-is-a-strategic-opportunity-analysis/. Accessed on October 19, 2016.

ACHIEVEMENTS IN REALISING THESE GOALS

All these efforts have yielded some positive results as India joined the Ashgabat Agreement in February 2018 and, significantly, India's entry into the Ashgabat Agreement comes two months after the inauguration of the first phase of the Shahid Beheshti terminal at Chabahar port on December 3, 2017, which was financed by India to the tune of \$85.21 million.⁴⁶ Both these developments now hold greater prospects for enlarging both the operational and practical scope of Chabahar to become a vital gateway and the shortest land route to Central Asia. The operationalisation of the INSTC is also inching closer to becoming a reality.

CHALLENGES FOR INDIA

The above discussion shows that India's viability and stature as a power in the global connectivity space is evolving. India, through bilateral, regional and multilateral cooperation is moving in the right direction. However, the dominance of China in the Central Asian region is the biggest challenge for India. China's massive economic penetration and increasing political influence in Central Asia has strengthened Beijing's presence in the region. The combination of China's interrupted economic growth and rising energy needs, the success of the Sino-Central Asian energy cooperation, China's huge investments in the Central Asian economies, granting loans and committing itself to the realisation of strategic infrastructure (pipelines, hydropower plants, bridges, roads, etc.) clearly reflect that China has become a strong pillar of influence in the region. Such a heavy economic and political clout is the biggest constraint not only for India but also for the CARs themselves. While the CARs might want to balance out the trade inequalities and not become too dependent on China, they are unable to do so. Over the years they have become linked to China by pipelines, roadways, railways, etc. but India has made only marginal progress on connectivity issues and its trade with the CARs has remained minimal. Also, the CARs' active support for the BRI project

46. "First Phase of Chabahar Port Opened, To Boost India-Iran Trade", www.newindianexpress.com/business/2017/dec/03/first-phase-of-chabahar-port-opened-to-boost-india-iran-trade-1717471.html. Accessed on December 6, 2017.

India's connectivity projects are a part of its multi-dimensional strategy. Through this strategy, it is not only making itself relevant in both regional and global contexts but also providing geographical routes, technological expertise, bigger and vibrant markets and investments to the recipient countries.

needs special mention as it will connect them with the world, physically as well as economically. On the other hand, India's trade and investment with these republics is minimal and minuscule compared to China's.

Further, India has been hampered on the connectivity front by not having a land-border with the CARs. It is trying to get connected to Central Asia through various projects like the International North-South Transport Corridor (INSTC), Turkmenistan-Afghanistan-Pakistan-India (TAPI) gas pipeline, Chabahar projects, etc. But, its investment potential and procedural bottlenecks are hindering time-bound implementation of the projects.

CONCLUSION

India, through various projects, has been attempting to make its own space in the region. It is presenting itself as a viable alternative to maintain the strategic balance in the region. Interestingly, these attempts are being taken positively by the CARs. Further, India's connectivity projects are a part of its multi-dimensional strategy. Through this strategy, it is not only making itself relevant in both regional and global contexts but also providing geographical routes, technological expertise, bigger and vibrant markets and investments to the recipient countries. However, India has not been able to make its presence felt in the region. It does not factor much in the changing political dynamics within the Central Asian region. To achieve its goals, India needs a persistent approach of engagement towards the region. It needs to accelerate its pace and actions on the implementation part of all the projects it has undertaken in order to build confidence and secure a big spot in the region. For that, active participation and cooperation in bilateral, regional and multilateral initiatives is the key.

CHINA'S MILITARY AND SATELLITE INTELLIGENCE PROGRAMME

DHRUBAJYOTI BHATTACHARJEE

INTRODUCTION

The idea of Chinese intelligence takes birth from the historic writings of Sun Tzu (*Art of War*) which bears a remarkable similarity to US definitions of intelligence functions and goals. Sun Tzu taught that “fore-knowledge” (*xianzhi*) allowed commanders to outmanoeuvre opponents. Mentioned as the eyes and ears of the dragon, Chinese intelligence gathering depends on technology, manpower, as well as developing and nurturing foreign assets. More modern definitions range from “activating [catalytic] knowledge” (*jihuo zhishi*) to information to protect national security, domestic stability, or corporate interests in a competitive environment.¹ For the Chinese, intelligence is transmittable (*chuandi xing*) and comprises knowledge that satisfactorily (*manzu xing*) resolves a specific decision-making problem.²

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1. Chen Jiugeng, “*Guanyu qingbao he xinxi* [Regarding Intelligence and Information],” *Qingbao Zazhi (Journal of Information)*, vol.19, no. 1, January 2000, pp. 4–6 as cited in Peter Mattis, “The Analytic Challenge of Understanding Chinese Intelligence Services”, *Studies in Intelligence*, vol. 56, no. 3, September 2012, p. 49.
2. Yan Jinzhong, “*Junshi qingbao xue*” [The Study of Military Intelligence] (Beijing: Shishi chubanshe, 2003), p. 12; Cheng Lei, “*Qingbao yuan yu qingbao genyuan* [Intelligence Sources and Intelligence’s Roots],” *Tushuguan zazhi [Library Journal]*, No. 3 1994, 16–18, as cited in Mattis, *Ibid.*, p. 49

The manner in which Chinese espionage has developed reflects the traditional Chinese hallmarks of patience and persistence as well as the centuries old Chinese custom of “*guanxi*,” the cultivation and use of personal networks to influence events and engage in various ventures.

The three main Chinese intelligence gathering methods often overlap. One is the “human wave” or “mosaic” collection, which involves assigning or dispatching thousands of assets to gather a massive amount of available information. Another is recruiting and periodically debriefing Chinese-born residents of other countries in order to gather a deeper level of intelligence on more specific subjects. The third method is patiently cultivating foreign assets of influence for long-term leverage, insight and espionage.³ The manner in which Chinese espionage has

developed reflects the traditional Chinese hallmarks of patience and persistence as well as the centuries old Chinese custom of “*guanxi*,” the cultivation and use of personal networks to influence events and engage in various ventures.⁴

CHINESE INTELLIGENCE STRUCTURE FOR EXTERNAL SURVEILLANCE

The role and fast spreading network of intelligence agencies and designated and dedicated divisions of the People’s Liberation Army (PLA), procuring and developing precision-guided equipment, has created a new need for assessing the structure and functioning of these agencies.⁵ While these

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3. “Espionage with Chinese Characteristics”, Intelligence Services Part I, *Stratfor Global Intelligence*, March 2010, p. 2, https://wikileaks.org/gifiles/attach/133/133464_INTEL_SERVICES_CHINA.pdf. Accessed on May 2, 2018.
 4. Fred Burton and Scott Stewart, “China: Guanxi and Corporate Security”, *Security Weekly*, January 16, 2008, <https://worldview.stratfor.com/article/china-guanxi-and-corporate-security>. Accessed on May 2, 2018.
 5. Luo Tianwen, Liu Ying, Liu Shoushuo, Tan Haifeng, and Wu Di, “Junshi qingbao gongzuozhong mubiao yaohai panding yanjiu,” *Qingbao Zazhi (Journal of Information)* vol.29, no. 6, June 2010, pp.107-109.

divisions have been known as “China’s CIA,”⁶ the Party’s need for more intelligence support would have created pressure for such organs to focus more on intelligence requirements rather than the national policy-makers.⁷

China’s intelligence services may not be as famous as the Central Intelligence Agency (CIA) or the Russia Intelligence Agency (KGB), but their operations are widespread and well known to counter-intelligence agencies throughout the world. The operations of intelligence gathering and their processing being divided within various groups, the Chinese intelligence

mechanism has turned into a major force to reckon with. Initially, the Social Affairs Department (SAD), under the Communist Party, was the principal intelligence and counter-intelligence organ. With the creation of the People’s Republic, the SAD got absorbed in the Ministry of Public Security (MPS), while the PLA had its own Military Intelligence Department (MID). During the mid-1950s, the Central Investigation Department (CID) was deputed the foreign responsibilities of SAD. Though it got disbanded after the Cultural Revolution, it became functional again during the governance of Deng Xiaoping. The Ministry of State Security (MSS) was created in 1983 by Deng in a merger of the CID and the counter-intelligence elements of the MPS.⁸

Being governed strictly under a single party dictatorship, in China the responsibility of gathering, assessing, as well as taking actions on domestic intelligence is done through its Communist Party Central Committee, the Ministry of State Security (MSS) or *Guojia Anquan Bu* (*Guoanbu*), the Ministry of Public Security (MPS) or *Gong An Bu* (which mostly caters to domestic

China’s intelligence services may not be as famous as the Central Intelligence Agency (CIA) or the Russia Intelligence Agency (KGB), but their operations are widespread and well known to counter-intelligence agencies throughout the world.

6. Kan Zhongguo, “Intelligence Agencies Exist in Great Numbers, Spies Are Present Everywhere; China’s Major Intelligence Departments Fully Exposed,” *Chien Shao* (*Hong Kong*), January 1, 2006.

7. Ian Easton and Mark Stokes, “China’s Electronic Intelligence (ELINT) Satellite Developments: Implications for U.S. Air and Naval Operations,” Project 2049 Institute, *Occasional Paper*, February 23, 2011.

8. Tainwen, et.al., n.5, p. 3.

intelligence) and the People's Armed Police (PAP). However, due to the opaque nature of China's executive leadership, it is difficult to determine exactly where, or with whom, the intelligence authority really lies. *Guoanbu*, with the cooperation of MPS, handles counter-intelligence, the former being the primary intelligence organisation. Bugging embassies and surveillance of embassy employees or those travelling on diplomatic passports is a common practice for the MSS.⁹

The MSS is also deputed the responsibility of recruiting intelligence officials, especially students from the Beijing University of International Relations. It also runs an internal security department known as the Ninth Bureau for Anti-Defection and Counter-Surveillance to check for moles from within the system. These intelligence officials are deputed to handle a legion of agents (usually known as assets or operatives), comprising Chinese nationals travelling abroad, or residing abroad, or born outside China or even foreign nationals. They are employed on short-term or long-term basis. In the new millennium, it has started employing non-Chinese government officials of other nations. It has also made massive acquisitions of technology for surveillance and information gathering. This is done either by acquisition of targeted technologies by personnel travelling abroad, or by purchasing the foreign firms producing the required technology or using front companies, especially located in Hong Kong, for procuring the desired technologies.¹⁰

The Military Intelligence Department (MID), also known as the Second Department or *Er Bu* of the People's Liberation Army, primarily focusses on tactical military intelligence. It has the responsibility of acquiring foreign technology to strengthen China's military capabilities. The First Bureau of the MID is responsible for gathering Human Intelligence (HUMINT) overseas and focusses, like the MSS Third Bureau, mainly on Taiwan, Hong Kong and Macao. It is responsible for obtaining much of the technological intelligence used to improve China's military capabilities and for finding customers for Chinese arms exports. The MID's Third Bureau is made up of military

9. *Ibid.*, p.4.

10. *Ibid.*, p.6.

attaches serving in overseas embassies. The Fourth, Fifth and Sixth Bureaus all handle the analysis of different world regions. Another unnumbered MID bureau disseminates intelligence to military officers and China's Central Military Commission (CMC).

The MID's "Seventh Bureau" is the Bureau of Science and Technology. This is where China's vaunted "cyber-intelligence" operations are designed and managed with the help of six government-linked research institutes, computer centres and legions of personal hackers. While not part of the MID, the Third Department of the PLA is another intelligence organisation that handles Signals Intelligence (SIGINT).

The MID's "Seventh Bureau" is the Bureau of Science and Technology. This is where China's vaunted "cyber-intelligence" operations are designed and managed with the help of six government-linked research institutes, computer centres and legions of personal hackers.

On the international and regional platforms, the following divisions play their specific roles as enumerated below.

- **8341 Unit – Central Security Regiment:** This provided security to Mao Zedong and the top political functionaries. It was responsible for the arrest of the Gang of Four in 1976, and was later disbanded after Mao's death.
- **First (Intelligence) Department – [1PLA] – General Staff Department (GSD) First Department:** Being one of the first divisions of operation, this division is delegated to collect information on the Beijing area, Guangzhou region, Nanjing area, Shenyang and Shanghai regions. It also has the responsibility of collecting information from Taiwan, Macao and Hong Kong, and was well known as the "Autumn Orchid" during the 1980s.¹¹
- **Second (Intelligence) Department – [2PLA] – GSD Second Department:** This division assimilates military Human Intelligence (HUMINT), Signals Intelligence (SIGINT) and Imagery Intelligence (IMINT) data,

11. William Hagestad II, *21st Century Chinese Cyberwarfare* (IT Governance Publishing, 2012), pp. 164-165.

and disseminates finished intelligence products to the Central Military Commission (CMC) and other consumers; it focusses on scientific and technological intelligence in the military field; and training intelligence personnel.¹²

- **Third Department – (3PLA) – GSD Third Department:** This controls SIGINT; monitors telecommunications of foreign armies; functions through communications stations placed within mainland China as well as in Chinese operations abroad; is responsible for cyber attacks and jamming; monitors the Political, and Logistics Departments, Science and Technology (S&T) and intelligence; oversees the 56th, 57th and 58th Research Institutes; manages or is affiliated with, the PLA Communications Security Bureau, China North Computation Centre, Third Department Computing Centre, National Research Centre for Information Security Technology, PLA Information Security Evaluation and Certification Centre, Information Security Research Institute, National Information Centre and National Information Security Engineering Technology Centre; it also assists in operating the Military Branch Technical Reconnaissance Bureau (MB TRB) of the PLA Air Force (PLAAF) and PLA Navy (PLAN), their headquarters, located in Changping district and Beijing's Haidian district.¹³
- **Fourth Department-(4PLA)-GSD Fourth Department:** This controls the Electronic Counter-Measure (ECM), Electronic Warfare (EW) and the radar of the General Staff Headquarters Department (GSHD); is involved in Research and Development (R&D); the Electronic Intelligence (ELINT) apparatus within SIGINT; cyber warfare, computer network attack and jamming; satellite jamming regiments; space-based reconnaissance and collection of imagery; four bureaus, one brigade and two regiments; manages or is affiliated with China Electronic Technology 18 Corporation (CETC), 29th Research Institute (Chengdu, Sichuan province), 36th

12. Second [Intelligence] Department, Federation of American Scientists, April 15, 2000. http://fas.org/irp/world/china/pla/dept_2.htm; Hagestad. *Ibid.*, pp.163-164.

13. Mark A. Stokes, Jenny Lin and L.C. Russell Hsiao, "The Chinese People's Liberation Army Signals Intelligence and Cyber Reconnaissance Infrastructure", Project 2049 Institute, http://project2049.net/documents/pla_third_department_sigint_cyber_stokes_lin_hsiao.pdf; Third Department, Federation of American Scientists, April 15, 2000, http://fas.org/irp/world/china/pla/dept_3.htm; Hagestad II, n.11, pp.151-154;

Research Institute (Hefei, Anhui province), PLA Electronic Engineering Academy (Hefei, Anhui province); and defends command bunkers in the Xishan Western Hills of Beijing. Its functions are assisted by the Southwest Institute of Electronic Equipment (SWIEE) and the MEI 54th Research Institute with headquarters in Ta Yuan, southeast of the Summer Palace.¹⁴

Fig. 1: Military Intelligence Department¹⁵

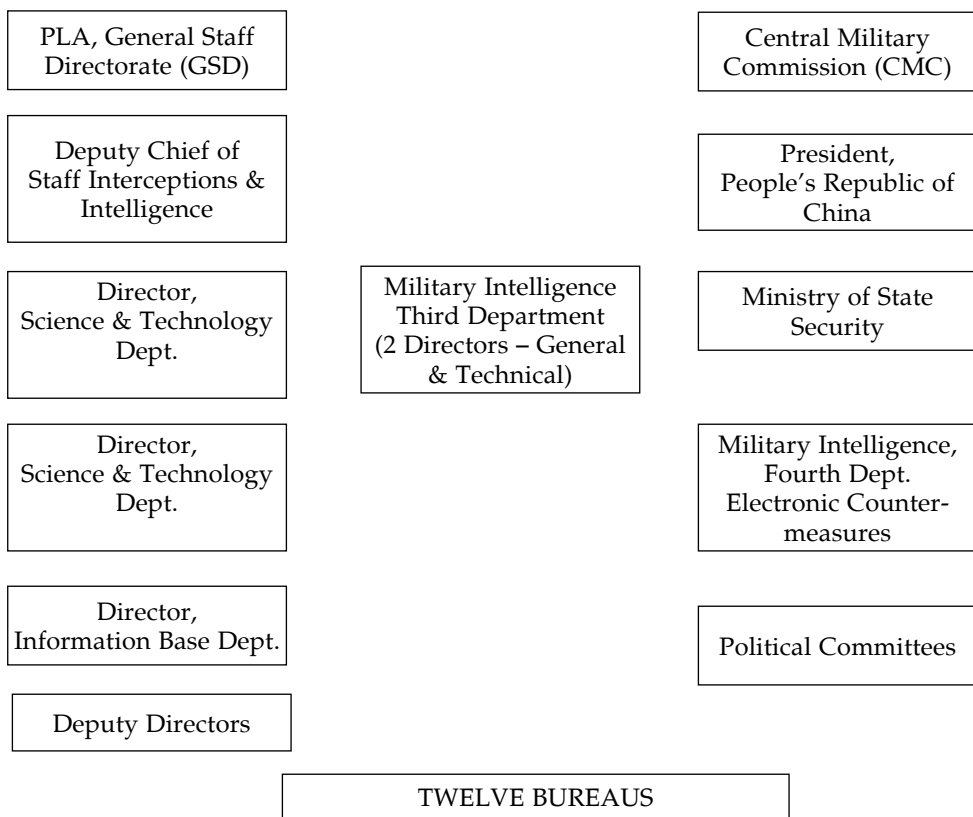


Fig. 1 above depicts the governing or organisation structure of the military intelligence which also oversees the satellite intelligence programme.

14. I. C. Smith and Nigel West, *Historical Dictionary of Chinese Intelligence* (Scarecrow Press, 2012), pp. 96-97; Lowell Dittmer and Maochun Yu, eds., *Routledge Handbook of Chinese Security* (Routledge 2015); Fourth Department, Federation of American Scientists, April 15, 2000, http://fas.org/irp/world/china/pla/dept_4.htm; Hagestad II, *Ibid.*, pp.155-162.

15. *Ibid.*, p. 167.

This chart pre dates the recent military reorganisation but the intelligence organisational structure remains as described.

SPACE-BASED SIGINT AND ELINT

For over 40 years, space-based SIGINT has been a critical component of the global and regional surveillance architecture. Within the broad domain of SIGINT, ELINT has proven to be an effective means of assessing a foreign military's electronic order of battle, including ground-based air defence radars and maritime surveillance systems. Ground and air-based, ELINT assets in space offer a wider field of view and broader geographical coverage.¹⁶

In a maritime context, notional targets could include radar systems such as the AN/SPS-48, AN/SPS-49, sea-based X-band radar, and AN/SPY-3 emitters. Targeted land-based air surveillance radar systems could include ground-based X-band radar (GBR-X), PATRIOT AN/MPQ-53, AN/TPS-75, and Upgraded Early Warning Radar (UEWR) systems operating in the Ultra High Frequency (UHF) portion of the frequency spectrum.¹⁷

The Third Department, as the figure above depicts, has been designated to assist, operate as well as coordinate the SIGINT as well as the ELINT operations of China. The twelve bureaus that operate under the PLA are as follows:

- **First Bureau (61786 Unit):** The unit has a more functional than a regional mission. It includes decryption, encryption, and other information security tasks.¹⁸
- **Second Bureau (61398 Unit):** Probably targets the United States and Canada, gathering political, economic and military-related intelligence. This bureau also supports mobile missions.¹⁹
- **Third Bureau (61785 Unit):** Has a functional mission which may be collection of line of sight radio communications, including border control

16. Ian Easton and Mark A Stokes, "China's Electronic Intelligence (ELINT) Satellite Developments: Implications for U.S. Air and Naval Operations", *Project 2049 Institute*, Virginia, February 23, 2011, p. 2.

17. *Ibid.*

18. "Han Yiming", Qinhuangdao Government Website, June 23, 2008, <http://121.22.8.170:81/content.jsp?code=188/2008-00006&name=>.

19. Stokes, et. al., n.13, p.8.

networks, as well as direction finding, and emission control and security.²⁰ It is also involved in counter-drug operations.²¹

- **Fourth Bureau (61419 Unit):** Focussed on Japan and Korea.²²
- **Fifth Bureau (61565 Unit):** Appears to have Russia related missions.²³
- **Sixth Bureau (61726 Unit):** Seems to have a Taiwan and South Asia mission.²⁴
- **Seventh Bureau (61580 Unit):** The mission of the bureau remains unspecific, with possible specialisation in computer network defence and attack.²⁵ One study of the bureau examined Support Vector Machine (SVM) applications for detecting intrusion patterns.²⁶ Another studied assessment of the future of the internet and Dense Wavelength Division Multiplexing (DWDM).²⁷ Another study focussed on the psychological and technical aspects of reading and interpreting a written foreign language,²⁸ while another dealt with the legal aspects of the global economy.²⁹
- **Eighth Bureau (61046 Unit):** It appears to focus on Western and Eastern Europe and perhaps the rest of the world (e.g. Middle East, Africa, and Latin America).³⁰
- **Ninth Bureau:** The most opaque body amongst all the bureaus of the department. It is considered to be the primary strategic intelligence

20. Ibid.

21. "Advanced on the National Anti-Drug Effort", *China Network*, June 2, 2007, http://www.china.com.cn/law/zhuanti/yldp/2007-06/02/content_8332019.htm.

22. Stokes, et.al., n.13, p.8.

23. Ibid.

24. Ibid., p.9.

25. "Diverse Language Identification Method", *Journal of Computer Applications*, 2005, 25, http://d.wanfangdata.com.cn/periodical_jsjyy2005z1172.aspx.

26. Li Jian, Jiang Chengshun, and Dong Liying, "Data Type Recognition Based on Selective Integration of SVM", *Computer Engineering*, vol 36, 13, 2010, http://d.wanfangdata.com.cn/Periodical_jsjgc201013064.aspx

27. Wang Qi and Dan Jun, "Network Centric Warfare Development and Technology Strategy", *Information Assurance and Communications Security*, December 2005, pp. 82-84, http://www.lw23.com/pdf_90d61a36-6c45-48bc-b6c2-4e2ddc8edbb8/lunwen.pdf

28. Zhang Ya'nan and Chen Tao, "Psychological Mechanism of Analyzing Foreign Language Reading", *Sciences and Wealth*, 2011, 3, http://d.wanfangdata.com.cn/periodical_kxycf201103095.aspx

29. Zhang Lidong, "New Developments in Economic Globalization and International Economic Law", *Law and Society*, 2009, 33, http://d.wanfangdata.com.cn/periodical_fzysh200933235.aspx

30. "Recognizing Top Translators for 2009", China Translators Association website, http://www.tac-online.org.cn/ch/tran/2010-12/09/content_3888394.htm

The GSD Third Department oversees a vast bureaucracy responsible for monitoring foreign communications, assuring the security of PLA computer and communications networks, and conducting cyber surveillance on priority targets around the world. If information is power, then the GSD Third Department represents one of the most powerful bureaucracies in China today.

analysis and/or data base management entity and may be involved in audio-visual technology and large scale data base management.³¹

- **Tenth Bureau (61886 Unit):** Also sometimes referred to as the '7911' Unit³², it appears to have a Central Asia or Russia-related mission, perhaps focussed specifically on telemetry and missile tracking and/or nuclear testing.³³

- **Eleventh Bureau (61672 Unit):** Also sometimes referred to as the '2020' Unit³⁴, and having the presence of Russian linguists, this appears to indicate Russia related missions.³⁵

- **Twelfth Bureau (61486 Unit):** *This appears to have a functional mission involving satellites, likely inclusive of intercept of satellite communications and possibly space-based SIGINT collection.*³⁶ It works in collaboration with institutes working on weather satellites, that must have dual use capabilities, bearing SIGINT and ELINT payload.³⁷

31. "Gong' An Intelligence Department and GSD Establish an Intelligence Analysis Cooperative Mechanism", Chinese People's Public Security University website, June 28, 2010, http://www.cpps.edu.cn/cfm_data/shownews_dw.cfm?newsid=1656&fyear=2010; "Public Security Intelligence Section and General Staff Department Establish Seminar Cooperation Mechanism", Public Security Website, June 28, 2010, http://www.cpps.edu.cn/cfm_data/shownews_dw.cfm?newsid=1656&fyear=2010.

32. Stokes, n.13, p.10.

33. Tao Wenzhao, *History of US-China Relations*, vol. 2, 1972-2000, Chapter 5: Peaceful Development, 1972-2000), (Shanghai: People's Publishing, 2004), http://ias.cass.cn/show/show_project_ls.asp?id=733

34. "Postal Code for 61762 Unit", Postal Code Net.

35. "Deputy Directors of the City People's Congress", December 6, 2005, http://www.jzsrd.gov.cn/news_view.asp?newsid=234.

36. "Human Resources Information", Kunshan Human Resources Market, Official Website, http://www.kshr.cn/ksasp/unit/SHOWEMPL.ASP?employee_id=660550.

37. "Meeting on Fengyun-3 Ground Application System Held", *Shinetek*, June 14, 2011, <http://www.shinetek.com.cn/Cn/View/Company/NewsDetail.aspx?NewsID=100016>.

The GSD Third Department oversees a vast bureaucracy responsible for monitoring foreign communications, assuring the security of PLA computer and communications networks, and conducting cyber surveillance on priority targets around the world. If information is power, then the GSD Third Department represents one of the most powerful bureaucracies in China today. Among its sources of strength is the country's largest pool of well trained linguists specialised in niche areas, such as banking and financial transactions, military activities, energy, and diplomatic exchanges.³⁸

The combination of SIGINT and CNE (Computer Network Exploitation), for example, fusing transcripts of phone conversations with intercepted email exchanges, would enable a powerful understanding of the plans, capabilities, and activities of an organisation or individual in near real-time. Key word and voice recognition technology and large data bases permit greater efficiency in collection, directed against specific targets. Advanced computing facilitates breaking of all but the most sophisticated encryption and passwords. The linkage between computer network operations and the PLA's psychological warfare training units appears reasonable. Monitoring of communications, email accounts, websites, and internal networks could support sophisticated perception management operations.³⁹

In addition to Third Bureau collection operations, the Third Department's 12th Bureau assets are dedicated toward intercept of foreign satellite communications. In addition to intercepting satellite communications from sites around China's periphery, the 12th Bureau may also operate specialised

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38. Stokes, et.al., n.13, p.15.

39. Ibid.

equipment onboard satellites that are capable of intercepting communications around the world from Chinese space-based systems.⁴⁰

While discussing SIGINT capabilities, there is a need to understand the impact of ELINT capabilities as well. Use of the doctrinal concept of integrated network and electronic warfare implies an attempt to link computer network attack and jamming, presumably under the purview of the GSD Fourth Department, which has overall responsibility for EW, including ELINT and tactical Electronic Support Measures (ESM).⁴¹

An unconfirmed Chinese source indicates that the country's first experimental ELINT satellite—the Shijian-1—was launched in March 1971. The SJ-1 satellite served on orbit for over eight years, and was hailed for its breakthroughs in power, control, telemetry, and sensors.⁴² Three ELINT satellites were launched as part of a follow-on “technical experiment satellite” series from July 1975 to August 1976.⁴³ These satellites were launched aboard the Feng bao-1 “Storm-1” launch vehicle which was specifically designed to meet the various requirements of ELINT satellite platforms.⁴⁴ In September 1981, China achieved a significant breakthrough, launching three Shijian-2 satellites aboard one carrier rocket, something observers saw as further adding to its ELINT satellite portfolio.⁴⁵ However, the initial high level Party leadership interest in the ELINT programme waned and nearly a decade followed with no known follow-on capability being launched.⁴⁶

SIGINT sites for the collection of radio and Satellite Communication (SATCOM) are spread throughout China, with the net control station situated in Beijing. Outside China, a SIGINT station has been established on

40. *Ibid.*, p.16

41. *Ibid.*, pp.14-15.

42. SJ's “Scientific Exploration and Technological Experiment Satellite Series”, *Huanqiu*, October 20, 2010, <http://mil.huanqiu.com/weapon/2010-10/1185243.html>.

43. “Imagery Reconnaissance and Electronic Reconnaissance Satellite Series”, *Anhui News*, January 22, 2007, <http://mil.anhnews.com/system/2007/01/22/001656523.shtml>

44. Mark A. Stokes, *China's Strategic Modernization: Implication for the United States* (Carlisle, PA: Strategic Studies Institute, 1999), p.4.

45. National Aeronautics and Space Administration (NASA), “Shijian 2B”, National Space Science Data Centre, <http://nssdc.gsfc.nasa.gov/nmc/masterCatalog.do?sc=1981-093A>.

46. James A. Lewis, “China as a Military Space Competitor”, Centre for Strategic and International Studies, August 2004, http://csis.org/files/media/csis/pubs/040801_china_space_competitor.pdf

Rocky Island (Shidao), near Woody Island in the Paracels. There have been persistent press reports of Chinese electronic surveillance sites in Myanmar, an ideal location for monitoring naval traffic in the Indian Ocean. China has also established multiple SIGINT sites in Myanmar and Laos. The Third Department and the Navy cooperate on shipborne intelligence collection platforms. Air force SIGINT collection is managed by the PLAAF Sixth Research Institute (*kongliusuo*) in Beijing.⁴⁷

Building on the foundation established under the Shanghai Bureau of Astronautics' 701 Programme,⁴⁸ the People's Republic of China (PRC) appears to have resurrected efforts to develop and deploy a space-based ELINT capability as part of a broader surveillance and reconnaissance architecture for tracking and targeting US and allied maritime assets. ELINT technology is designed to intercept electromagnetic radiation, and works in tandem with imagery sensors – especially space-based Synthetic Aperture Radar (SAR) – for strategic and naval reconnaissance. China has long enjoyed Asia's most extensive SIGINT capability. However, most of its assets have been land-based and airborne, and not in space.⁴⁹ A surge of recent military space launches and a number of authoritative Chinese writings suggest that this may be changing. China has begun deploying a robust network of ELINT and imagery satellites in order to locate and track large warships, mobile air defence systems, and other critical defence systems.⁵⁰

There have been numerous studies in China which have conducted evaluations on the effectiveness of a space-based information system in supporting ballistic missile operations and long-range precision strike.⁵¹ For example, one study states:

47. Stokes, n.44, p. 34.

48. Ibid.

49. Lewis, n.46.

50. Easton and Stokes, n.7, p. 4.

51. Wu Weiqi and Zhang Yulin, "Effectiveness Evaluation Approach for Space-based Information Support System of Missile Operations", *Journal of the Academy of Equipment Command & Technology*, vol.17, no.2, 2006; Wu Weiqi and Zhang Yulin, "Space Information System Optimization for Long-range Precision Strike", *Journal of the Academy of Equipment Command & Technology*, vol.17, no.3, 2006.

Developments underway suggest that China is working to improve its ability to quickly download, process, and disseminate the intelligence gathered from space, including that from ELINT satellites.

During the tactical process of ASBM attack/defense the support of space-based satellite information is highly required for target reconnaissance, missile early-warning, global communications, precision guidance, battle damage assessment and the digitalized construction of the battlefield...Thus, an ASBM requires military satellite support at every stage of the attack process.⁵²

In discussing the role that ELINT satellites would play in China's Anti-Ship Ballistic Missile (ASBM) programme, this study goes on to emphasise the importance of C4ISR (Command, Control, Communications, Computers, Intelligence, Surveillance and Reconnaissance) sensor fusion:

During the process of planning [to use] the fire power of an ASBM, [there is a need] for obtaining reliable target intelligence information for guiding the missile attack. This could be achieved by integrating EO imaging satellites, SAR imaging satellites, electronic reconnaissance satellites, naval ocean surveillance system satellites, mapping resource satellites, and highly accurate commercial remote sensing satellite imagery, which could be purchased on the international market. Through the integration of the data obtained via a number of different satellites, and with the addition of processing and data fusion, [one could] guarantee missile guidance requirements for all types of target information for a long-range ASBM strike.⁵³

This highlights the importance of developing a robust ground-based satellite support system to help integrate space-based ELINT into a broader

52. Pan Changpeng, Gu Wenjin and Chen Jie, "An Analysis on the Capabilities of Military Satellites to Support an ASBM in Offense and Defense Operations", *Winged Missiles Journal*, 2006, no.5, p.12.

53. *Ibid.*, p.13.

C4ISR system. It also underscores the challenges in prioritising missions as the demand for ELINT collection capabilities comes from an expanding number of intelligence consumers. Authoritative sources suggest that China has made considerable progress in this area.⁵⁴

Developments underway suggest that China is working to improve its ability to quickly download, process, and disseminate the intelligence gathered from space, including that from ELINT satellites. One study described the developments as such:

It appears that China is laying the foundation for what could be a robust space-based network of satellites dedicated to ELINT collection. It could also be developing clandestine piggy-backed sensors that could work with other space and terrestrially-based Intelligence, Surveillance, Reconnaissance (ISR) sensors to enable a truly informationalised network for global SIGINT/ELINT collection in near real-time.

As electronic reconnaissance satellites develop, the requirement to obtain military intelligence from the satellites increases. The issue at hand is how to (from the ground) quickly, effectively set and decide satellite system mission tasking for effective, appropriate ground application of satellite resources... Satellite ground stations combine and use six systems for linking up with electronic reconnaissance satellite signals: 1) Antenna systems: responsible for uploading and downloading satellite signals; 2) Emitting systems: responsible for ordering satellite signal modulations, encryption, etc. Post-processing, these work through antenna systems; 3) Receiving systems: receiving signals from the satellites, and after processing then send to terminal station system; 4) Terminal station systems: responsible for reconnaissance data processing, satellite command and mission arrangement; 5) Monitoring and control systems: monitor satellites and downlink operation status and monitor over all ground station; 6) Power supply system: providing power for all ground station equipment. In short, an electronic reconnaissance

54. Stokes, p.44, p.8

satellite ground station is an integrated system for receiving, processing and managing data.⁵⁵

China utilises shared facilities to support a number of satellites along with its maritime observation Haiyang series satellites. Ground stations supporting these satellites are located in Beijing, Sanya, Hangzhou, and Mudanjiang. China also has a ground station in Antarctica supporting these satellites.⁵⁶ It is reported to operate at least three other ground stations abroad. These are located in Swakopmund, Namibia; Malindi, Kenya; and Karachi, Pakistan.⁵⁷ China's operational headquarters and data processing centre for remote sensing satellites is located in Beijing, with three main ground stations supporting the network located in Miyun, near Beijing; Kashgar, in Xinjiang; and Sanya on Hainan Island.⁵⁸

While it appears that China has experienced a lag in developing a robust electronic signals collection capability, there is another possibility one could posit. It is possible that the Chinese strategic leadership has long benefited from unidentified ELINT sensors attached to other satellite payloads, and recent launches simply represent an increase in dedicated systems. It is possible that SIGINT/ELINT sensors have piggy-backed aboard Chinese remote sensing satellites in Low Earth Orbit (LEO) and communications satellites in Geosynchronous Orbit (GEO) for many years.⁵⁹ Authoritative Chinese writings have explored the utility of GEO for SIGINT/ELINT sensors, stating:

55. Wang Lei, Zhou Qi, and Chen Peiqun, "LEO Electronic Reconnaissance Satellite Ground Station Mission Tasking and Decision-Making Methods", *Communication Countermeasures*, no.1, 2010, pp. 48-49; Wei Ping, "Architecture for Signal Processing Technology Used in Electronic Reconnaissance", *Communication Countermeasures*, vol.101, no.2, 2008, pp.3-7.

56. "Haiyang Satellite Ground Station Established in Antarctica", *Space Exploration*, no.1, 2010, p.12

57. Steven A. Smith, "Chinese Space Superiority? China's Military Space Capabilities and the Impact of Their Use in a Taiwan Conflict", *Air War College*, February 17, 2006, p.14, <http://www.au.af.mil/au/awc/awcgate/awc/smith.pdf>.

58. Evan Ellis, "Advances in China – Latin America Space Cooperation", *China Brief*, July 9, 2010, [http://www.jamestown.org/single/?no_cache=1&tx_ttnews\[tt_news\]=36602&tx_ttnews\[bckPid\]=13&cHash=23bb61c38d](http://www.jamestown.org/single/?no_cache=1&tx_ttnews[tt_news]=36602&tx_ttnews[bckPid]=13&cHash=23bb61c38d)

59. Stokes, n.44, p. 10.

In the information age, the utilization of electronic reconnaissance satellites to obtain intelligence has become an important method [of doing so]. Geostationary electronic reconnaissance satellites provide unique advantages and are being increasingly emphasized... Using geostationary satellite platforms to engage in electronic reconnaissance is useful for the large coverage ranges available for obtaining electronic information in the air, including terrestrial and other radar signals, communications signals, satellite telemetry, etc. It also allows for the continuous, long-term surveillance of target areas; obtaining intelligence in real-time to provide rapid electronic intelligence for diplomatic and strategic military decisions.⁶⁰

In what could have implications for the clandestine use of telecommunications satellites in geostationary orbits for SIGINT/ELINT purposes, one Chinese aerospace electronics engineer at a research institute closely associated with the Chinese military analysed the use of airborne telecommunications systems for the collection of SIGINT, and found it to be possible to combine both the telecommunications and SIGINT missions on one hardware platform.⁶¹

Ultimately, Chinese writings advocate combining sensors in both orbital realms to optimise effectiveness.⁶² It appears that China is laying the foundation for what could be a robust space-based network of satellites dedicated to ELINT collection. It could also be developing clandestine piggy-backed sensors that could work with other space and terrestrially-based Intelligence, Surveillance, Reconnaissance (ISR) sensors to enable a truly informationalised network for global SIGINT/ELINT collection in near real-time. This development may hold serious implications for the Asia-Pacific region, especially for major world powers as well as all

60. Dong Qiaozhong and Zhu Weiqiang, "Research on ELINT Satellite Techniques in GSO", *Electronic Warfare*, July 30, 2009, p.13.

61. Mao Cheng, "Design of RF Receiver System for Multi-Mission Payload, Telecommunications Engineering, July 2009, p.68.

62. Lu An'nan, "Thoughts on Developmental Problems of ELINT Satellite Passive Geo-location Techniques", *Communications Countermeasures*, March 2008, pp. 19-20.

international and regional actors' naval and air operations, air defence systems, communications security, counter-space requirements, and nuclear deterrence.⁶³

As per the "2018 Worldwide Threat Assessment of the US Intelligence Community", released in February 2018, by the Office of the Director of National Intelligence, "If a future conflict were to occur involving Russia or China, either country would justify attacks against US and allied satellites as necessary to offset any perceived US military advantage derived from military, civil or commercial space systems".⁶⁴

As per a RAND report, the role of the Strategic Support Force (SSF) also remains important, which is basically the infrastructure to support the PLA in the battlefield so that the PLA can achieve superiority in the space, cyber space, and all other electromagnetic domains. It is an important force in joint operations whose actions are integrated with the army, navy, air force, and rocket force.⁶⁵ Space-related units in the Space Systems Department include launch centres and satellite control centres from the former General Armament Department (GAD). Other units within the SSF include research institutes from the former General Staff Department (GSD)⁶⁶ and could also include units from the Third and Fourth Departments of the former GSD responsible for signals intelligence and electronic counter-measures and radar, respectively, as well as the Informatisation Department, which is responsible for communications.⁶⁷

The SSF fulfills its space mission role in two ways. The first and main function of the SSF in regard to space is C4ISR support to an operational

63. Stokes, n.44, p. 14.

64. Statement for the Record Worldwide Threat Assessment of the US Intelligence Community, February 13, 2018, p. 13

65. Qiu Yue, "Our Military's Strategic Support Force Is What Type of Military Force?" (我军战略支援部队是一支什么样的军事力量?), China Military Online (我军网), January 5, 2016.

66. "China PLA Strategic Support Force Network Systems Department 56th Research Institute" (中国人民解放军战略支援部队网络系统部第五十六研究所), China Graduate Student Enrollment Information Network, May 24, 2017; and "China PLA GSD 58th Research Institute (中国人民解放军总参第五十八研究所), China Graduate Student Enrollment Information Network, September 13, 2016.

67. "Laser Ranging Systems Project Sole Source Announcement (激光探测定位系统项目单一来源采购公示公告), Beijing Guotai Jianzhong Management and Consulting Co. Ltd., October 31, 2016.

force through its computer network, communications, and space-operations functions. The SSF's C4ISR capabilities provide the connective tissue between units that enables the PLA to effectively conduct joint operations and successfully prosecute "system vs. system warfare" that the PLA characterises as essential to winning modern wars. The SSF fulfills this role by launching and operating China's satellite architecture, although its role in providing mobile space launch capabilities remains unclear. With its capabilities, the SSF plays a critical role in supporting the types of aerospace power projection operations the PLA expects it will need to conduct in future scenarios.⁶⁸

Another important space function is the counter-space mission. Although information on this issue remains incomplete, the SSF's Space Systems Department appears to be charged with carrying out the co-orbital counter-space mission involving satellite-on-satellite attacks. It could logically be expected to take on responsibility for other counter-space missions as well, although Chinese publications provide little information on direct-ascent Anti-Satellite (ASAT) and directed-energy weapons capabilities due to the secretive nature of China's counter-space programme.⁶⁹

Other counter-space functions performed by the SSF appear to be carried out by its Network Systems Department, which appears to be responsible for jamming satellite communications and Global Positioning System (GPS) signals, as well as hacking into the computer systems of space facilities and their satellites. The main direct war-fighting role of the SSF overall appears to be in the cyber and electromagnetic domains (a role that is beyond the scope of this paper). As a result, the SSF appears to be an organisational response to the PLA concept of integrated-network EW that emphasises combining cyber and EW forces into a joint force.⁷⁰ Additionally, because PLA strategists view space and cyber warfare as

68. Kevin L. Pollpeter, Michael S. Chase and Eric Heginbotham, "The Creation of the PLA Strategic Support Force and its Implications for Chinese Military Space Operations", RAND, RR2058, 2017.

69. Ibid.

70. Kevin L. Pollpeter, "Controlling the Information Domain: Space, Cyber, and Electronic Warfare," in Ashley Tellis and Travis Tanner, eds., *Strategic Asia: 2012-13: China's Military Challenge* (Seattle, Wash.: National Bureau of Asian Research, 2012), pp. 181-182.

important components of strategic deterrence alongside nuclear and conventional forces, the SSF would also appear to be poised to play an important role in China's further development of its strategic deterrence posture and in the conduct of deterrence operations.⁷¹

Many unknowns remain but there are strong indications that Chinese military and satellite intelligence is making up for the lack in matching up with the conventional forces that major world powers possess, redrawing geopolitical and geostrategic maps in South Asia, Southeast Asia and Central Asia, and strengthening the defensive as well as offensive capabilities for any future conflict that might force China to be a major player.

71. Pollpeter, et.al., n.68.

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