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Research Paper | Pakistan's Space Renaissance:

A Pathway to Climate Resilience

Areesha Manzoor

Abstract

Space technologies are being used as an important tool to tackle climate crises in the pre- and post-disaster management phases. This paper investigates the potential impact of Pakistan's space programme renaissance on increasing national climate resilience. This study uses an exploratory research design and qualitative methods, based on both primary and secondary data that are thematically analysed. This study employs the theoretical lens of technological determinism, which argues that technological innovation acts as the principal driver of social, political, and environmental transformation. It finds that Pakistan's expanding space-based infrastructure has strengthened anticipatory climate governance, particularly through near-real-time flood mapping, NDMA early warning reports, and the SACRED-SUPARCO disaster portal. The integration of domestic satellite data along with international imagery has expanded spatial coverage of climate-vulnerable regions, though continued dependence on foreign data highlights a partial capability gap. Overall, while Pakistan's technological capacity for climate monitoring has advanced considerably, institutional coordination and absorption capacity continue to shape the effectiveness of space-based contributions to climate resilience.

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Link: <https://cpd.org.bd/resources/2026/08/CPD-Climate-Compendium-2025.pdf>

Op-ed | Why Nuclear Export Controls Must Keep Pace with Emerging Technologies

Shahwana Binte Sohail

Scientific collaboration across the world is changing at an unprecedented rate with the advent of artificial intelligence, cloud computing and digital research platforms. Sensitive technical knowledge can now be shared between scientists internationally via virtual laboratories, cloud technologies for collaboration, and AI tools to support research. These innovations promote peaceful nuclear cooperation, but they also reveal vulnerabilities in export control systems that are geared towards the physical movement of nuclear materials and technologies, not digital knowledge. With the growing technological competition, nuclear export controls must remain with cutting-edge technology, and this has become an important international security priority. The Nuclear Suppliers Group (NSG) has been the cornerstone of multilateral nuclear export controls. Its effectiveness, however, does not so much lie in the preservation of rules as in their transformation with technological change. The NSG has contributed to non-proliferation goals, and to this end, has, through common guidelines and harmonized export control standards, facilitated legitimate civilian nuclear cooperation and trade. Today, however, the dangers to the NSG are not the same as those which prompted the creation of the NSG 50 years ago.

Decades of nuclear export controls have proven successful in curbing the proliferation of sensitive nuclear materials and technologies through concerted international export controls. But their traditional emphasis on physical export is under challenge due to the introduction of digital technologies and intangible transfers of technical knowledge. Proliferation is not just the proliferation of nuclear materials or equipment. Sensitive knowledge on nuclear issues has changed hands because of emerging technologies. It can now cross borders with the help of cloud-based research, additive manufacturing, intangible technology transfer and digital communication. For example, cloud research platforms for collaboration are becoming more common, allowing controlled sharing of technical information from different parts of the world in real-time without requiring the export of information physically. This makes it hard to police intangible technology transfers, since sensitive technology data is now transferred electronically and no physical transfer takes place.

This challenge is reflected in virtual collaboration platforms. They enable engineers from various states to exchange technical information, which may be of a controlled nature, and work together on dual-use technologies without the exchange of any physical product. Export control regimes therefore need to go beyond merely containers and contents to algorithms, digital files and virtual research environments. Only physical export controls can no longer be sufficient in this context. Poor export controls help increase the risk that sensitive nuclear technologies will be used for unauthorized or proliferation activities, which threatens to undermine international security and decades of non-proliferation efforts.

Effective export control is emerging as a central strategic issue in the context of the sharp increase in investments in advanced manufacturing, quantum technologies, AI, etc. Numerous export control regimes have been unable to keep pace with the pace of technological evolution. All these technological challenges are developing in the face of a more complicated geopolitical background. But the multilateral governance structures that are based on consensus are increasingly under pressure. In the wake of mounting strategic competitions, Global Value Chains are becoming more fragmented, and technological advances are accelerating. The pressures all add up and make it harder for institutions such as the NSG to respond quickly to new proliferation challenges.

The answer is, however, not to tear down the existing export control architecture. The NSG is one of the most successful models of multilateral cooperation related to nuclear non-proliferation. It retains its role as the main structure for the multilateral coordination of nuclear export controls among participating governments. In the last few years, NSG guidance has been reinforced to address these new challenges to intangible technology transfers. But these steps need to be part of a larger strategy for the export control regime to be more adaptive and resilient.

The maintenance of nuclear export controls can no longer be done with updates of control lists. More technical cooperation should be done, and the exchange of information and the participation of scientific and industrial sectors in export control should be increased. They should also periodically assess export control mechanisms to ensure they keep pace with rapidly changing technology and new methods of transferring knowledge through intangible means. Before the development of AI-enabled research platforms, cloud collaboration and additive manufacturing, among other emerging technologies, create gaps in export control

rules; participating governments should put in place regular technical review processes aimed at evaluating these technologies. The establishment of technical knowledge and institutional capabilities will enhance the responsiveness of export control systems while maintaining legitimate cooperation for peaceful nuclear use.

Nuclear non-proliferation will not be easy, as it will have to deal with the transfers of sensitive nuclear materials but also the increasingly complicated transfers of knowledge and technology. No longer is it a question of whether export controls are needed. The real question is whether export control regimes will be able to move quickly enough to remain relevant in a rapidly evolving technological landscape.

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Link: <https://thediplomaticinsight.com/nuclear-export-control-keep-pace-emerging-tech/>

Op-ed | From Achieving Independence to Ensuring Independence: Deterrence and National Resilience and Crisis Management

Anam Murad Khan

In 2026, Pakistan is celebrating its 79th Independence Day, commemorating the sacrifices of millions of people who contributed to the creation of the country. However, the journey of sacrifice continues, as Pakistan's Armed Forces, with the support of the entire nation. They remain committed to strengthening the country's defence and safeguarding its sovereignty. A recent example of this commitment was Operation Bunyan-al-Marsoos, which demonstrated Pakistan's resolve and preparedness to defend its independence and national security.

On May 10th, 2026, Pakistan celebrated the first anniversary of Marka-e-Haq. It is one year of the epochal Operation Bunyan al Marsoos, which means 'a fortified structure' not just literally but also in real terms. Despite India's provocation, Pakistan maintained escalation control through its resolve, discipline, and restraint, as symbolized by its name. Pakistan's defense operation demonstrated a calibrated response and a prime example of exercising nuclear responsibility under escalating pressure. The Full-Spectrum Deterrence (FSD) enabled Pakistan to respond India across all levels of conflict and maintain strategic stability.

In contrast, India resorted to rapid escalation in May 2025 conflict and used nuclear rhetoric accompanied by military strikes. This crisis revealed the divergent behavior of two nuclear armed states under pressure. It provided a case study in which India's doctrinal escalation threatened crisis stability, while Pakistan's restrained military response and sustained diplomatic engagement played a crucial role in preventing the catastrophe and restoring regional stability. Such situations indicate that deterrence is shaped by perception, posture, and psychological signaling, rather than by a fixed set of redlines.

Indian crisis behavior encompassed aggressive strategic signaling that heightened the escalation risks. Indian Prime Minister Narendra Modi exercised an offensive military posture and granted the Indian armed forces full freedom to launch massive attacks against Pakistan. This "New Normal" that India attempted to establish involved using terrorist attacks as a pretext to conduct military strikes against Pakistan and carve out a space for limited war under the nuclear overhang. Furthermore, India did nuclear provocations by calling Pakistan's nuclear

deterrent capabilities as ‘nuclear bluff’, ‘nuclear blackmail’, whereas Pakistan did not engage in any nuclear signaling. Such a provocative communication during the crisis was fraught with risks as India attempted to weaken the established norms of restraints and crisis communication. Eventually, amidst the heightened risks of escalation, the space for the critical capability of diplomatic de-escalation in the nuclear-sensitive environment shrank.

On the other hand, Pakistan’s response was disciplined and structured escalation control under intense escalation pressure. Pakistan’s armed forces refrained from nuclear signaling and maintained deterrence through conventional means. They invoked Pakistan’s FSD posture which aims at preventing conventional war between the two nuclear-armed states. Operationally, Pakistan conducted successful defensive aerial actions and neutralized Indian threats through precision strikes, cyber-attacks and other non-kinetic measures against the military targets.

Pakistan also observed restraint in both vertical and horizontal escalation behavior. Pakistan thwarted escalation dangers by not deploying Babur cruise missiles even when India used BrahMos systems. Observing restraint, Pakistan’s strategy was *quid pro quo plus* and focused on achieving military objectives while avoided hitting civilian infrastructure. These decisions reflected no structural limitation, but the conscious management of escalation. It made Pakistan’s response precise, proportional and containing clear strategic boundaries aimed at preventing crisis escalation beyond the conventional threshold.

Another distinguishing feature of Pakistan’s crisis management strategy was its robust diplomatic engagement. The openness to diplomatic engagement aided Pakistan’s sustained effort for the crisis de-escalation. Right after the Pahalgam attack, Pakistan called for a neutral and transparent investigation, which was declined by India. Pakistan also supported and appreciated international mediation efforts led by the United States and other countries, which culminated in the ceasefire on May 10, 2025. Through its policy and actions, Pakistan emphasized the significance of sustaining dialogue, upholding confidence-building measures, and preserving the Indus Water Treaty (IWT) despite Indian abeyance. At the multilateral level, Pakistan supported consensus-based condemnation of terrorism at the United Nations General Assembly without accepting rhetorical attribution of responsibility by India. It also engaged international partners to emphasize restraint and the importance of avoiding escalation. Major international forums and powers did not endorse India’s attribution narrative but instead

emphasized de-escalation, dialogue, and restraint, aligning more closely with Pakistan's position. This diplomatic posture reflected Pakistan's broader understanding of nuclear responsibility, extending strategic restraint beyond the battlefield into international legitimacy and crisis governance.

The 2025 crisis revealed fundamental differences in nuclear behavior between India and Pakistan under conditions of escalating pressure. India's approach prioritized rapid attribution, expanded military strikes, and a doctrinal shift toward immediate use of force under its 'new normal' framework. This posture, while assertive, involves risks of miscalculation in a compressed decision-making environment. On the other hand, Pakistan combined conventional deterrence with strict operational restraint and avoided all forms of nuclear signaling. Its behavior demonstrates that nuclear responsibility is defined not by possession of nuclear weapons but by disciplined non-use and the avoidance of their political or strategic exploitation during crises. While India emphasized unilateral military responses and rejected mediation, Pakistan consistently supported dialogue, and commitment to peace with dignity and honor. These divergent approaches reflected fundamentally different interpretations of deterrence stability, where one side viewed escalation as a tool of compellence and the other resorts to escalation control as a strategic asset essential for stability.

The crisis highlighted the need for strengthened crisis management mechanisms between nuclear-armed states in South Asia. Existing frameworks, including DGMO hotlines, ceasefire agreements along the Line of Control, and ballistic missile notification regimes, require reinforcement and modernization to remain effective under contemporary threat conditions. The initiation of structured dialogue at the national security advisor and foreign secretary levels is essential to reduce miscalculation risks and improve communication during crises. Moreover, updated confidence-building measures addressing cyber conflict, emerging technologies, and communication failures are increasingly necessary in modern security environments. The continued weakening of institutional communication channels increases the risk of escalation driven by ambiguity and misperception. Strengthening these mechanisms is therefore essential to maintaining strategic stability in a nuclearized region. The 2025 South Asian crisis demonstrated how rapidly conventional conflicts between nuclear-armed states can escalate into strategically dangerous situations.

The episode highlights the enduring risk of miscalculation, particularly when diplomatic channels are weakened, and military signaling becomes ambiguous. India and Pakistan exhibited contrasting approaches, with one emphasizing rapid escalation and doctrinal assertiveness, and the other prioritizing restraint and controlled deterrence. Pakistan's response demonstrated that nuclear credibility is derived not from escalation or demonstrative force but from disciplined behavior and measured capability under pressure. Eventually, the crisis underscores that nuclear stability depends not only on material capabilities but also on judgment, signaling discipline, and responsible state conduct. Sustaining regional peace requires institutionalized restraint, effective communication mechanisms, and sustained commitment to conflict de-escalation. In the nuclear age, the perceived space for war between nuclear-armed states remains an illusion, one that, if tested, carries inherently catastrophic consequences.

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Op-ed | AI Deepfakes and Strategic Stability: Is South Asia Ready for the Next Information War?

Shahwana Binte Sohail

The next India-Pakistan crisis might not begin with a missile, but with a video that never happened. AI can now generate realistic videos, images and audio within minutes. In a nuclearized region, marked by crises, it's not just a change of technology; it can have implications on how crises emerge and escalate in South Asia. There is no longer a communication problem with AI-generated deepfakes. They are emerging as a risk factor in their own right.

The prospect of this is not the only serious risk that can be created by this development. Time compression is a bigger worry. AI makes it easier and quicker to create and spread false content; it is for governments and fact-checkers to check. In May 2025, India and Pakistan faced a crisis, and while there was a lot of misinformation, it was still possible to take time to verify and issue an official response, as much of it was still created and disseminated by humans. With the advent of generative AI, the pace of innovation has accelerated, and now it's possible to generate highly realistic text, images, audio and video in minutes and at scale, creating a much shorter timeframe to separate fact from fiction. This makes institutional verification systems have a hard time catching up with the AI-generated information flow. This increasing gap between the pace of synthetic content production and institutional response is even more problematic during times of military tension, when slow verification can lead to confusion, public panic, and potential unintended escalation.

This was the new reality that was borne out of the May 2025 India-Pakistan crisis. In addition to actual footage, social media was filled with "recycled" footage of the battle, false claims and misleading images that were made up as if they were current events. These events illustrated how easily false information can take over the information environment during a crisis, and how difficult it could be to separate facts from false information for the public and the media.

This is where deepfakes really change the rules of the game in a crisis. AI-generated deepfakes are more lifelike than traditional misinformation, and can replicate uses of military leaders, battlefield events and government announcements. They can have an impact on public opinion,

even if they are later exposed as false, and can lead to additional political pressures and military signalling problems during a crisis. In response to these risks, India has introduced a proposal for stand-alone legislation against digital misdemeanours including deepfakes powered by AI. The move points to the growing recognition that synthetic media is no longer simply a cybercrime concern, but it's a national security concern as well.

These are especially acute in the context of Pakistan's security, where the crisis communication arrangements are not oriented towards AI-based information warfare. The problem is that it's not official information that reaches people last, but false information disseminated through social media. In this context, it doesn't matter whether or not a good deepfake is widely believed to be dangerous; it merely matters that it is spread enough to influence initial reactions, framing in the media or political pressures. In other words, the Inter-Services Public Relations (ISPR) of Pakistan is under pressure from the public and media in crisis situations to act quickly in the event of spreading any misinformation through social media. However, official responses are often issued after the false narrative has "already been" in effect and thus can be advanced with a much larger audience. This highlights the need for establishing a real-time digital verification and response cell in Pakistan for the cyber command to more effectively detect, debunk and rebut misinformation generated by AI.

This risk is reflected in recent incidents. In 2026, AI-generated videos falsely showed senior military officials making statements on sensitive regional issues. Although they were later debunked, the videos demonstrated how quickly manipulated content can influence public perception and complicate crisis management before verification is possible. This is not a South Asia-only phenomenon. During the Iran conflict, images and videos were rapidly shared on social media platforms, frequently altering public opinion even before official information was available and often using AI to generate videos and images. These cases illustrate a trend that is becoming more common: today's conflicts take place in an environment of faster visibility than verification.

But South Asia is particularly vulnerable because of its long history of military crises between two nuclear-armed neighbours. Crisis management is challenging enough during times of increased tension and uncertainty, let alone in times of political or military pressure and signalling. AI-powered deepfakes in these contexts can raise the potential for miscalculation,

potentially by causing confusion about military operations or official statements. The misinformation that ensues can help to escalate even if it is later corrected.

The real problem is that the notion of deterrence is based on the rational understanding of signals. That's what deepfakes are challenging. Even the most believable deterrent messaging can be undermined by signals that can be fabricated to cast doubt, delay or misinterpretation. Strategic stability is thus no longer just a question of capability or intent but now also involves the question of the ability to verify information during a crisis.

Regulation alone will not solve this challenge. Social media sites need to build quicker detection systems, on pace with generative AI. There is a need for more rigorous verification procedures for security-sensitive content, particularly during crises for news organisations. First, states need to invest in real-time authentication capability – the ability to either confirm or challenge synthetic content within a matter of minutes, rather than hours. This also requires Pakistan and the region as a whole to change their way of thinking. Information security cannot and should not be viewed as a second-order cyber issue. It is increasingly coming to be an integral part of crisis stability. Even well-managed crises can be upset by technically accurate but operationally effective stories, without credible and quick verification mechanisms.

It is also crucial to have dialogue at the regional level. Preexisting efforts to build trust were developed to address traditional military threats, rather than those stemming from the presence of AI and information manipulation. These frameworks can be updated to incorporate digital verification cooperation, communications during crisis situations and common protocols for synthetic media identification, which would help to mitigate the risk of a potential unplanned escalation. Artificial Intelligence is changing the way information is disseminated and is also influencing decision-making processes for governments in case of crisis. The next India–Pakistan crisis could be not just on the battlefield but on social media as well. It's no longer optional; it's a necessity to prepare for that reality or risk the loss of strategic equilibrium.

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Op-ed | Exercise ROTOR CLAP III and Mission Sudarshan Chakra: Options for Pakistan

Abdul Moiz Khan

The Indian Air Force (IAF) concluded a week-long drill, Exercise ROTOR CLAP III, on 2 August at the Pokhran firing range in Rajasthan. The exercise was conducted to validate a key operational concept of shooting down unwarranted low-flying loitering munitions and drones. The article argues that the exercise is part of an attempt by the IAF to plug the loopholes exposed during Operation Sindoor, especially pertaining to the incursion of Pakistani drones deep into Indian Territory. This activity carries serious consequences for Pakistan, as it is linked to India's attempt to establish a defensive shield against airborne objects, as evidenced by New Delhi's pledge to operationalize Mission Sudarshan Chakra.

As its name suggests, it is not the first edition but the third, conducted by the IAF using its rotary assets to take out drones since India launched Operation Sindoor last year. This was not a usual activity for the IAF but rather a novel attempt to test and validate new warfighting tactics, techniques, and procedures, with a central focus on shooting down slow-moving airborne targets. The exercise involved rotary-wing platforms from the IAF fleet, including Apache, Prachand, Mi-25/35P, Rudra, and Mi-17V-5.

It was held under the aegis of the IAF South Western Air Command, which saw the activation of its units at forward operational bases in Rajasthan, bordering Pakistan. The air rotary maneuvers were conducted there because both Prachand and Apache helicopters are deployed in different air stations and aviation bases in Rajasthan. Apaches of the IAF have been deployed at the IAF Jodhpur air station since 2022, while Apaches are with the 451 Army Aviation Squadron based in Jodhpur. The field activity suggests it could be a broader part of the Sudharshan Chakra Mission and serve as its airborne leg to intercept and neutralize aerial objects. This could be the case because rotary platforms have demonstrated in recent conflicts that they are as effective as other defence systems at shooting down intruding aerial objects. For instance, the Israeli Air Force Apache helicopter shot down six drones in a couple of minutes during the 2025 12-day Iran-Israel war. As India has close and strategic cooperation with Israel, it is a strong possibility that the IAF may have approached the Israeli Air Force for assistance as well.

A key question arises as to whether India has sufficient numbers of helicopters to carry out the task of tracking and shooting down airborne drones and loitering munitions. The backbone of the Indian helicopter fleet would be the indigenously developed Prachand. The IAF and Indian Army Aviation Corps have 10 and 5 Prachand helicopters in service, respectively. In the future, 156 additional units will be inducted into the fleets of both services. Out of 156, 66 will be supplied to the IAF and 90 to the Indian Army. These 156 helicopters will be delivered by 2032. The order could be completed earlier as well, as Hindustan Aeronautics Limited (HAL), the original manufacturer of Prachand, has partnered with Adani Defense Systems and Technologies Limited and Bharat Earth Movers Limited (BEML) to boost its annual production.

Likewise, Rudra will also be used for drone interdiction missions, as it has already been inducted in large numbers by both the IAF and the Indian Army. The IAF has one operational squadron and is expected to induct three more, whereas the army has around 75 of them across five operational aviation wings. In addition, both services have 28 advanced Apache helicopters in service: 22 with the IAF and 06 with the Indian Army. The number will likely increase in the future, as India has already retained the capability to produce parts of the Apache, including its key component, the fuselage.

ROTOR CLAP III specifies that the Sudharshan Chakra Mission's scope has expanded beyond a ground-based air defense shield. It now also entails using helicopters to interdict drones and loitering munitions. The exercise also envisages that rotary platforms capable of flying low to evade even low-level radars can perform these missions in proximity to the border with Pakistan. It is not as cost-effective a means to interdict low-cost drones as using ground-based air defense guns or jammers; however, it is far less expensive than firing costly missile interceptors. All this points to New Delhi seeking to increase its options and expand its horizons to intercept a wide range of airborne threats as part of a wider air defense doctrinal recalibration in response to limitations encountered during Operation Sindoor.

Amid rapidly changing regional and global dynamics, India's Pakistan-specific military maneuvers, to the extent of using new tactics earlier employed by Israel against Iran, are a sign of concern. India has a strategic partnership with Israel, so the possibility cannot be ruled out that the IAF may have received assistance from the Israeli air force in the preparation and

execution phase of ROTOR CLAP III. This could be the case, as Israel has a history of supporting the IAF to enhance its warfighting tactics, as evident from its timely support during the Kargil War. Likewise, the possibility seems more probable because India has also been aiding Israel's war effort, as evidenced by a newly released report by Amnesty International. To counter the IAF's growing novelty, Pakistan needs to adopt new strategies and tactics to counter the IAF's evolving tactics. First, Pakistan should induct high-speed loitering munitions, with speed exceeding Mach 0.5, as at this velocity it will be difficult for helicopter-based interdiction by the IAF. Second, to engage Indian rotary platforms that might come close to the border, Pakistan can close the low-level radar detection gap that the former seeks to exploit by deploying advanced long-range electro-optical sensors that do not rely solely on line-of-sight radar horizons, along with additional low-level radar deployment. Last but not least, the Pakistan Army and Air Force should conduct joint exercises to develop a joint strategy to counter the IAF's evolving tactics, thereby enabling them to uphold conventional deterrence at the tactical level.

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Link: <https://thediplomat.com/2026/08/exercise-rotor-clap-iii-and-mission-sudarshan-chakra-options-for-pakistan/>

Op-ed | Non-Nuclear Military AI and the Risk of Misperception for a Nuclear War

Muhammad Ali Baig

In July 2026, hackers leaked over nineteen thousand files from India's Kudankulam nuclear power plant. The files contained blueprints, cooling layouts, and supplier lists. On the surface, this was a routine cyberattack. But beneath the surface, a new danger emerged. A military AI does not need to hack nuclear codes. It only needs data. Non-nuclear military AI excels at scanning massive data dumps in minutes and reacting in seconds, its perception/ misperception decides the fate of human species.

Let us consider that AI can map dependencies that human analysts would take months to find. It can identify which civilian cooling pumps keep backup generators running. It can spot which third-party cloud servers relay construction updates to the plant's management. Now imagine a conventional crisis. The hackers use this AI to actively probe those exposed supply-chain networks. The probe is purely non-nuclear –it targets logistics, not warheads. But India's own AI-driven threat detectors see a foreign system probing a nuclear facility. The AI cannot distinguish between a probe aimed at a civilian contractor and a probe aimed at disabling nuclear command. It flashes a red alert. Decision-makers have minutes, not days. They see a sophisticated attack on their nuclear infrastructure. They do not see the attacker's true conventional intent. This is the hidden trap of non-nuclear military AI. It accelerates intelligence, but it also accelerates confusion. It turns a civilian data breach into a possible nuclear trigger. This essay explains how such non-nuclear AI tools create this deadly overlap and what steps can reduce the risk.

How is Non-Nuclear AI increasing the risk?

AI use in military systems is spreading among nations. There are concerns about using AI directly for nuclear weapons but AI's role in non-nuclear military instruments can also increase the threat of nuclear war. This is a serious, but often unrecognized issue.

There are three primary applications of Military AI. It may be used as a component in nuclear command and control systems. It can be mounted on nuclear delivery vehicles. The third is the

most risky application i.e. the overlapping utilization of AI for non-nuclear purposes, since some of the conventional systems and nuclear systems are, in most cases, linked together. For instance, a stealth bomber is capable of carrying conventional bombs or nuclear warheads. States have similar use of satellites, radars, and other types of launch pads. In a case where early-warning satellites monitor non-nuclear and nuclear attacks. AI with a non-nuclear system (overlap) can exacerbate this issue. For example, an AI-driven cyberattack against a shared conventional and nuclear satellite could appear as a threat of the nuclear type. Both states may not be aware of such type of attack. It could lead commanders to think that they are being attacked or put them in a more complex situation involving nuclear weapons. Therefore, it could get panicked and retaliate with nuclear weapons or it may lead them to initiate a conventional war. In a nutshell, non-nuclear AI may lead to a terrible confusion. It accelerates decision making, miscalculation, and misperception, inadvertent conventional and nuclear escalation. It may perceive a hybrid of conventional and nuclear attack.

Illustrative Case Studies

The two hypothetical case studies illustrate how non-nuclear AI can increase the risks of nuclear weapons during actual conflicts.

Firstly, the U.S. has an AI enabled system to monitor Chinese submarines. This is a strictly conventional system. It can be used only in anti-submarine warfare. In a tense stand-off, the US AI system detects abnormal sonar signals near a US aircraft carrier in the South China Sea. These are the signals that the AI fails to understand. It sees the normal maintenance on the submarine as preparation for a torpedo attack. The AI suggest immediate counter-striking of the Chinese submarine. This is the advice that is heeded by the US commanders.

The US strikes the Chinese submarine. China has no idea whether this was an isolated incident or the first incident in a series of attacks. China uses nuclear submarines to activate a second-strike capability. Without these submarines, it has nothing to defend itself against the possibility of a first strike by the US. China's leaders are worried about the nuclear threat to their country. They have high probability of additional US strikes with their AI-driven threat assessment systems. China raises the alert of its nuclear forces to a high level if it is under extreme time pressure. The US reacts and is worried about a Chinese first strike. Now both sides are in an almost explosive situation. This all happened due to a non-nuclear AI tool. It made a wrong

assessment and shortened the time for decision making and gave false perceptions that were deadly.

Secondly, India starts a conventional military attack across the Kashmir border. India has an AI-based battle management system to manage the movement of troops and artillery. This is an AI which is not for nuclear use. It aims to speed up and make the “Cold Start” doctrine effective in India. The AI examines the defensive positions in Pakistan and suggests the targeting of precision strike on Pakistani command centers. Yet, for some reason, the AI has the wrong forward headquarters in Pakistan. This is the headquarters which is closely connected with Pakistan’s nuclear communication network center.

This command center is damaged by India’s strike. Pakistan sees this attempt to be a direct effort to make Pakistan’s military force blind or mute for a major conventional attack by India. The tactical nuclear weapons of Pakistan, such as NASR, can be used for the purpose of holding down a bigger Indian conventional attack. In retrospect, the non-nuclear AI strike was unintentional and it crossed a critical red line. It posed a threat to the nuclear command system of Pakistan. While there was no intent to attack nuclear assets, this directly raised the risk of deliberate nuclear escalation in a volatile region.

Here are some examples from case studies that demonstrate the potential for a dangerous application of non-nuclear AI. There are, however, some steps states can take to prevent such situations. First, there should be a human in the loop for all AI-enabled systems. The use of AI to recommend or initiate a military strike should never happen without a human’s explicit consent. Secondly, states must set up clear communication channels. When things go wrong, leadership needs to be able to communicate rapidly. This will make it less likely that someone may misinterpret an AI-driven action as a nuclear attack. Thirdly, states should exchange data on their non-nuclear AI systems. Transparency builds trust. If China knows how the US surveillance AI works, it doesn’t worry when it encounters a regular detection. Likewise, in Pakistan if they know about Indian AI battle management, they might not go wrong. Fourth, states are required to constantly test and audit their military AI. Algorithms can make errors. These errors can be prevented from leading to a crisis with regular checks. Five, attempts should be made to keep conventional and nuclear systems apart. Much of the danger is due to entangled technology. Militaries should, if possible, employ different satellites, radars, and command centers on nuclear and non-nuclear operations. Last but not least, international

community should strive to reach an agreement. These deals may restrict the use of AI in traditional military activities around nuclear facilities. These norms will not eradicate all threats but they can make things clear, give time for the leader to think, and avoid a little mishap becoming a nuclear tragedy. To sum up, AI in non-nuclear military applications is a serious threat. It does not have to be a nuclear bomb to start a nuclear war. It increases the speed of crises. It confuses conventional and nuclear investments. AI driven attacks could be misunderstood by the State. They could lead to use of nuclear weapons due to fear and panic. Thus, states need to exercise prudence. Clear rules and lines are vital to manage these new risks of misperception and catastrophic miscalculation.

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Link: <https://cesran.org/non-nuclear-military-ai-and-the-risk-of-misperception-for-a-nuclear-war.html>

Op-ed | Rendezvous and Proximity Operations (RPOs) in the Legal Grey Zone of International Space Law

Areesha Manzoor

Space exploration is expanding in its scope, actors, and applications over time. This evolution of space catalyzed innovation for the benefit of humanity but also resulted in congestion and competition in space. As more states started depending on satellite technologies for national security and civilian uses, counterspace capabilities also evolved. Security World Foundation declared Co-orbital weapons as one of the counterspace capabilities in its Global Counterspace Threat Assessment (2026). It defines a co-orbital weapon as “weapons that are placed into orbit and then maneuver to approach the target to attack it by various means, including destructive and non-destructive.”

Rendezvous and Proximity Operations (RPOs) technologies are inherently dual-use and come under the umbrella of co-orbital weapons. Rendezvous is the process of intentionally bringing two or more space objects into an orbit by orbital maneuvers such as “matching the plane altitude and phasing.” Proximity operations are a series of maneuvers a satellite does in the same or nearly the same orbit in the vicinity of another space object for a specific time duration to accomplish mission objectives. RPO technologies are dual-use; they have civilian and commercial uses such as refueling, repairing, on-orbit inspection, and life extension. RPO technologies can come under counterspace capabilities, as the intention of maneuvering a satellite can be mistaken and misinterpreted by the other side. States’ risk assessment plays a major role in perceiving an RPO satellite as a threat or not. Moreover, RPO satellites can perform functions such as surveillance, disruption, or decryption of signals, jamming communication, interference with optical sensors, grabbing a satellite, and releasing high- or low-velocity co-orbital kinetic anti-satellite weapons.

RPOs are not a new phenomenon, but states are increasingly building sophisticated RPO technologies amid space competition. The US, Russia, and China have conducted multiple RPOs and exhibited their capabilities. The US does not have any dedicated program for developing co-orbital counterspace weapons; however, it conducted multiple RPOs in both Low Earth Orbit (LEO) and Geostationary Earth Orbit (GEO). These activities included

targeting, tracking, and hit-to-kill (HTK) intercept technologies that can be potential co-orbital anti-satellite capabilities. The US conducted 5 RPOs in 2025 in GEO that maneuvered closely to their own satellites and Chinese satellites as well. Moreover, the Delta 180 mission was a showcase of offensive capabilities such as physical collision to destroy a satellite. A missile interceptor under the proposed “Golden Dome for America” project can also be transformed into a space weapon program.

Russia has actively invested and performed various RPOs in recent decades in both LEO and GEO. Russia is considered to be building its anti-satellite (ASAT) capabilities out of the mothballs of the Cold War. Many satellites of the Cosmos series and Luch satellites were launched under RPOs for purposes such as co-orbit inspection, intelligence collection, and surveillance. Some of these satellites, Cosmos 2542, 2543, 2558, 2576, and 2588, were co-planar with US satellites. Such RPOs can result in supporting target identification and tracking, intercepting broadcasts, or jamming radio waves, thus hampering satellite communications. Russia did not explicitly test co-orbit hit-to-kill (HTK) weapons. However, it has tested deployment of aerosol or cloud, and multiple subsatellites or payloads at low and high velocities. There are speculations that the Burevestnik program may have been launched by Russia to develop a co-orbital ASAT program. Russia can develop a co-orbital ASAT weapon by deploying a high-velocity payload.

China is also a major actor in space, developing counterspace capabilities. It has conducted various RPOs in both LEO and GEO. The first RPO by China was conducted in 2010 that involved SJ-12 and SJ-06F. In 2025, China launched SJ-21 and SJ-12 02 for RPOs. The latter came within 60 km of the US satellite USA336. The closest RPO was conducted by SJ-17, which had a robotic arm, which approached the target satellite within 1 km for detailed inspection. The potential military utility of Chinese RPOs is to demonstrate on-orbit space situational awareness (SSA), satellite servicing, inspection, and imaging capability. China has not tested any offensive co-orbital weapons to destroy any space object.

RPOs of major powers boost the security dilemma for each other as they perceive others' actions as offensive. There is a legal loophole in the Outer Space Treaty (OST) (1967) on RPOs. Some general clauses can explain how a state shall conduct an RPO; however, it is barely more than basic guidelines. For instance, Article XI of OST puts states under an obligation to inform the UN Secretary-General, the public, and the international scientific community. However,

states only provide generic descriptions and avoid transparency. Similarly, Article IV (Registration Convention) requires states to register specific details, but states register information that meets a general function to avoid revealing potential dual-uses. Article XI (OST) suggests that states shall act with “due regard” to the other states’ interests. Due regard is a vague term, as inspecting and surveilling a satellite might not be considered as offensive as kinetic ASATs. There is no legal way to limit the extent of proximity between two satellites involved in RPO. Another problem that international space law cannot address is the intent problem related to RPO. States can undertake RPO for military purposes, but publicly project it as peaceful uses. The absence of baseline norms increases the risk of misreading intent and sudden escalation.

Addressing RPO-related risks requires a multi-pronged approach centered on dialogue, transparency, and verification. States should begin by discussing agreed definitions of behavior for military space activities, as the phrase “peaceful exploration” is vague. A shared definition of threatening RPOs will help avoid any misinterpretation by any country. States shall make pre-notifications and avoid going into others’ “keep-out” zones, i.e., high-value GEO assets. A multilateral Space Situational Awareness mechanism would reduce the threat for states with weaker tracker systems. Defining an escalation framework for RPOs using clear vocab, for example, “likely benign”, “warrants inquiry”, and “imminent threatening, will avoid any offensive response based on perceived worst-case scenarios. Direct, fast-channel, bilateral crisis hotlines shall be used to reduce miscalculation risk. In a nutshell, RPOs are classified as a counterspace threat in space; however, they are by nature dual-use. Proximity of another state’s satellites will be considered offensive by all states. RPOs are used for inspection and imaging of other states’ satellites by all major powers. It can escalate an offensive episode in outer space. There is a dire need for major powers to come forward and take measures to prioritize stability and peace in space.

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Op-ed | How Saudi-US Nuclear deal Ushers Nuclear Competition in the Middle East

Nawal Nawaz

On 22nd July, the Trump administration announced it would sign a civil nuclear deal with the Kingdom of Saudi Arabia, allowing the export of nuclear technology to Riyadh. However, According to White House, the deal, called a 123 agreement, is centred on ratification of the Abraham Accords. By signing the Abraham Accords, KSA would officially recognize the state of Israel, requiring normalizing peaceful relations with Israel. The US-Saudi peaceful nuclear deal comes at a time when the global nuclear order is already eroding. As the international arms control architecture has already been dismantled following the erosion of the New START and the failure of the NPT review conference to meet its stipulated goals, the recent US-KSA peaceful nuclear deal will not bode well considering the aspiration of several other countries to acquire the same technology, let alone the nuclear program of Iran. Moreover, this recent civil nuclear arrangement veers off the gold standard nuclear arrangement with the UAE, allowing KSA to reprocess nuclear waste and enrich uranium. Though the US administration has imposed strict inspection measures and non-proliferation mechanisms, critics believe that the chances of weapons-grade enrichment cannot be ruled out. With this deal, the United States will assist KSA in establishing a civil nuclear program; however, analysts believe that this bilateral arrangement could set off a regional arms race.

The official text reflects that the United States has agreed to assist Saudi Arabia in fulfilling the kingdom's energy requirements through the peaceful uses of nuclear technology. Under this deal, the US will assist KSA in diversifying its energy mix with viable energy alternatives; however, it also includes a uranium enrichment facility that American companies would operate. Previous negotiations on the exchange of nuclear technology between the US and KSA required Saudis to accept the additional protocol that allows enhanced inspection by the UN nuclear watchdog; however, this deal has no such provision. In the absence of the Additional Protocol, American companies will not be able to manage "black box enrichment facilities."

KSA's struggle to acquire peaceful nuclear technology is not a recent phenomenon; back in 2018, Crown Prince Mohammad bin Salman expressed his willingness to acquire nuclear

weapons in case Iran developed a nuclear bomb. The officials in Riyadh believe that the ongoing US-Israel war against Iran will encourage Tehran to expedite the enrichment of fissile materials. This bilateral arrangement will also urge other states in the region to pursue the nuclear option, ushering in a nuclear competition in the Middle East.

Similarly, the latest nuclear deal between the Kingdom and the US signifies a deviation from the 2009 gold standard civil nuclear deal between the UAE and the US. As per that deal, the UAE decided to forgo its domestic uranium enrichment and nuclear waste reprocessing while adhering to the obligations of the IAEA's Additional Protocols. Unlike the UAE-US deal, the provision of an enrichment facility in the agreement and the capability to reprocess nuclear waste could offer KSA an opportunity to abandon its civilian purpose and pursue nuclear waste processing.

In Tel Aviv, this bilateral arrangement has been viewed with resentment, expressing anxiety about a Saudi deal that would likely influence other nations to seek nuclear enrichment programs. As per the White House, the deal is contingent on Riyadh's signing the Abraham Accords. The prospects of normalization of ties between Riyadh and Israel seem unlikely in the absence of diplomatic negotiation for the establishment of a Palestinian state. With the US condition of joining the Abraham Accords, a nuclear deal with Riyadh seems in a diplomatic limbo. However, prospects of its materialization do not dim, facing a mere delay in case the kingdom refuses to recognize Israel. In the Middle East, the US needs KSA to counter threats from the Iranian regime, and with this nuclear settlement, the Trump administration has kept Riyadh in its camp, insulating the kingdom from betting on a Chinese nuclear alternative.

This latest civil nuclear partnership between the US and KSA comes at a time when one stakeholder, the US, is involved in waging war against Iran. At this time, Iran will not perceive this civil nuclear partnership in a positive manner, perceiving the deal as an offensive maneuver. The ongoing American onslaught against Iran already questions the feasibility of Khamenei's anti-nuke fatwa. Against such a polarized environment, potential nuclearization of KSA may push the region into crisis, creating a security dilemma for other states like Turkey and Egypt. In response to this nuclear settlement, Turkiye and Egypt may explore the nuclear option for their security

It can be concluded that, the US-KSA civil nuclear deal would ultimately hasten nuclear competition in the Middle East. Through this nuclear settlement, though, KSA would be able to get US support in reducing the country's dependence on hydrocarbons; the Middle East would descend into overt nuclearization, casting dire consequences for strategic stability in the region.

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Op-ed | Pakistan's Engagement with the International Atomic Energy Agency: A Case Study of the Normative Evolution

Dr Bilal Zubair

International Nuclear Order is largely defined as the covenant of international treaties, governing institutions and other legal frameworks associated with nuclear technology regulation. However, what sustains it goes beyond the legally binding instruments to state behavior and shared norms. The perception of a state's responsible nuclear behavior is shaped by these norms which eventually influence its conduct and global partnerships. A constructivist vantage point defines this phenomenon in terms of fluidity where norms keep evolving. Changes in security realities and global political trends as well as technological developments, are some of the many impetuses contributing to the evolution of norms. This transition manifests the evolution of the traditional nonproliferation regime into a more intricate framework.

The Norm Life Cycle explains different stages of normative evolution. At first, the norm entrepreneurs enable the emergence of norms by promoting novel standards of behavior. After those standards gain legitimacy, they enter the cascade stage where they are disseminated across the international system. When those norms are internalized and cemented at the international level, they eventually become a trend to be considered as legitimate conduct. To demonstrate, the global nonproliferation regime serves a pertinent example where the treaty underwent a significant normative evolution. The Articles I and II of the Nuclear Nonproliferation Treaty (NPT) obligated the prevention of nuclear weapons. However, the Post-Cold War changes in the security environment challenged the normative construction of the NPT. Advances in dual-use technologies and the globalization of trade were the exposing factors. As a response, the broader global institutional nonproliferation required translation to responsible state-centric nonproliferation. States were expected to enhance their nuclear safety and security frameworks and adopt United Nations Security Council Resolution 1540 to strengthen export control regimes. Such initiatives necessitated the creation of strong domestic controls to counter the proliferation of weapons of mass destruction.

The norm of peaceful use is another normative evolution the nuclear nonproliferation regime has witnessed. Article IV of the NPT ordains the peaceful uses of nuclear technology. Again,

this norm of peaceful usage intent was insufficient. With the tragic nuclear accidents at Three-Mile Island, Fukushima, and Chornobyl, the transboundary consequences of nuclear accidents became obvious. This led to the transition of the norm of peaceful use to the safe, secure and safeguarded and sustainable one too. This norm has become a responsible behavior in the shape of emergency preparedness, radioactive waste management, and the independence of regulatory oversight. The role of the International Atomic Energy Agency (IAEA) gained prominence to ensure this through the development of global standards and promotion of cooperation among states.

The third evolution is about nuclear disarmament. According to Article VI of the NPT, states parties to the NPT are obliged to negotiate in good faith on practical steps relating to nuclear disarmament. Bilateral cuts have been large since the end of the Cold War, but nuclear weapons have not been eliminated. The global discourse has stressed the concept of responsible nuclear restraint. Together with the long-term aim of elimination. More attention has been paid to practical measures, including arms control agreements, strategic equilibrium dialogs, confidence-building measures, transparency-based initiatives and nuclear risk reduction. Such measures are not alternatives to the goal of disarmament; they are a way to reduce nuclear risks in the interim, while keeping the long-term objective envisioned in Article VI intact.

The continuing development of these norms is a reflection that responsible nuclear conduct today is light years away from the original obligations in the NPT. States are now judged not only on their treaty commitments but also on how effectively they put international standards into practice for safety, security, safeguards, controls on exports and the peaceful use of nuclear technology.

Pakistan's interaction with the International Atomic Energy Agency is a practical reflection of this larger normative evolution. Pakistan has been an inaugural member of the IAEA since 1957 and has been participating in the Agency's Technical Cooperation Program for almost seven decades. It is one of the Agency's longest-standing technical cooperation partnerships with projects in nuclear power, health care, manufacturing, agriculture, management of water resources, education and nuclear safety.

Pakistan has six civilian nuclear-powered reactors which are all covered under IAEA safeguards in the energy sector. Together, these facilities produce roughly 8.4% of the nation's

power. Pakistan has collaborated with the IAEA on issues related to reactor safety, emergency preparedness, radioactive waste disposal, regulatory development and Operational Safety Review Team (OSART) inspections to ensure that its civilian program conforms with international safety standards.

Healthcare is the most significant domain of Pakistan-IAEA cooperation. The Pakistan Atomic Energy Commission has 21 Atomic Energy Cancer Hospitals in the country. These hospitals conduct almost 1 million diagnostic and therapeutic operations every year. Pakistan faces upwards of 180,000 new cancer cases each year. With support from the IAEA, these institutions have received advanced radiotherapy technology, nuclear medicine technologies, assurance of quality programs and specialist training. In acknowledgment of its exemplary high level of expertise, the Nuclear Medicine, Oncology and Radiotherapy Institute (NORI) in Islamabad was designated as one of the IAEA's first Rays of Hope Anchor Centers in 2023.

Another significant pillar of cooperation is agriculture. In collaboration with both the IAEA and the Food and Agriculture Organization, Pakistani experts have developed over 150 improved crop varieties through mutation breeding techniques. These are rice, wheat, cotton, chickpea, mungbean and sugarcane. A number of the above varieties are cultivated in millions of acres and genetically modified cotton accounts for roughly 90 percent of Pakistan's cotton cultivation. Nuclear techniques are also applied for soil fertility management, control of pests, isotope hydrology, livestock improvement and food preservation.

Pakistan has also become an important institutional partner of the IAEA in research and capacity development. The country hosts four IAEA Collaborating Centres; PIEAS, PINSTECH, NIAB, and NISAS, while NORI serves as a Rays of Hope Anchor Centre. These institutions conduct research, organize international training programmes, participate in coordinated research projects, and provide technical expertise to other IAEA Member States. NISAS alone has organized more than 30 national, regional, and international IAEA training courses and workshops on nuclear security. From a constructivist perspective, the collaboration between Pakistan and the IAEA elucidates how the evolved norm of responsible peaceful use can shape state behaviour beyond the framework of the NPT. Pakistan's experience shows that responsible nuclear conduct is measured not only by legal commitments but also by adherence to international standards, institutional capacity, and the effective use of nuclear science for sustainable development and human welfare.

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Op-ed | From Water Sharing to Strategic Stability: Rethinking the Future of the Indus Waters Treaty

Shahwana Binte Sohail

The decision by India to place the Indus Waters Treaty (IWT) in abeyance has transformed the treaty from a water-sharing agreement into a test of strategic stability in South Asia. The treaty, once seen as a technical document to deal with the management of shared rivers, is now more influenced by geopolitical rivalry, loss of political trust, and growing securitisation of water. So, its future will not be as much dependent upon hydrology or law as upon the ability of India and Pakistan to maintain one of the last few institutionalised channels of communication in an increasingly hostile relationship.

The IWT was agreed upon to take care of the equitable utilisation of the Indus system and not be affected by the larger political differences between India and Pakistan. But it has slowly become a subject of geopolitical importance than water allocation. The treaty formed the Permanent Indus Commission, a set-up that institutionalised regular communication between two adversarial states, and a framework for dispute resolution. These mechanisms offered a consistent forum for technical cooperation, even in times of armed conflict and diplomatic impasse, and thus shielded water cooperation from broader political conflicts.

Today, that institutional robustness is more under threat than it ever has been before. The fact that India has kept the treaty in abeyance and has recently demanded a complete renegotiation of the treaty is symptomatic of a new trend in which water is seen as a national security issue. Calls for renegotiating the treaty illustrate how issues once viewed primarily through technical and legal lenses are increasingly being framed in security and geopolitical terms.

Meanwhile, Pakistan has been demanding the observance of the treaty and has stated that any dispute should be handled as per the dispute settlement mechanism outlined in the treaty rather than by unilateral actions. The difference in the two views is indicative of the growing political and security conflicts between India and Pakistan that have affected the future of IWT. The treaty, which had previously been considered more of a technical and institutional solution, is now subject to a more comprehensive political analysis; shifting to a political dimension puts the treaty in danger.

The impacts are not just in the Indus Basin. With the treaty being placed in abeyance, and with one of the last remaining institutional ties with Pakistan broken, the management of any future conflict could become even more challenging, and misunderstandings in future conflicts much more likely. Its decline would thus have implications, not just for water security, but for the larger mechanisms which help to manage the tensions between two atomic weapons states.

The IWT is now confronted with increasing environmental pressures, against the backdrop of diminishing political trust. Undeniably, the pressure on the Indus Basin has increased as a result of climate change, swift population growth and rising demand for agriculture. However, above all, there is a need for technical cooperation to find solutions to these environmental problems. Instead, bilateral relations have been growing more securitised; cooperation is more challenging than ever, and more so when it is most necessary. Even routine issues such as sharing hydrological data and conducting technical consultations are increasingly viewed through a strategic lens, reducing the space for constructive interaction. The paradox is that more institutional coordination is needed to manage the common risks, and political mistrust is a problem for the very mechanisms that are supposed to facilitate institutional coordination.

The reduction in institutional collaboration has ramifications beyond water management. The IWT was considered by many as a classic example of institutional cooperation taking place in spite of geopolitical competition and has been a valuable tool to keep the dialogue between India and Pakistan alive. A lack of this institutional structure may open the door to developing a new model of shared resource management based on strategic competition. If such measures as dialogue and confidence-building are undermined in this area where India and Pakistan are both nuclear powers, it may make future crises more likely.

If the IWT is to continue serving as a stabilising mechanism, its institutional and technical functions must be protected from broader political tensions. The current treaty structure should therefore be reinforced to respond to new challenges in an effective way, without compromising the peace of the region. First, there is a need to revive regular meetings of the Permanent Indus Commission of both countries and enhance the use of the dispute resolution mechanism provided in the treaty. Secondly, regardless of political tensions, continuous technical cooperation on hydrological data, adaptation to climate change and river management is needed. Lastly, both sides should refrain from using water as a weapon for strategic pressure,

as doing so could further deteriorate one of the last remaining bilateral channels of communication. The Indus Waters Treaty is at a crossroads more than 60 years after it was signed. More than the language of the provisions, its future will depend on the commitment of India and Pakistan to maintain one of the few institutional arrangements that has survived many political crises before. Perhaps the treaty's most valuable contribution is that it has provided a forum for dialogue where other means of communication have failed. The most successful aspect of the Indus Waters Treaty has not been the sharing of rivers, but the dialogue. Protecting the waters could be as crucial as protecting that dialogue, especially in an age of escalating strategic tensions. These steps won't solve the overall India-Pakistan conflict, but they can help minimise the threat posed by water being yet another flash point for regional discord or conflict.

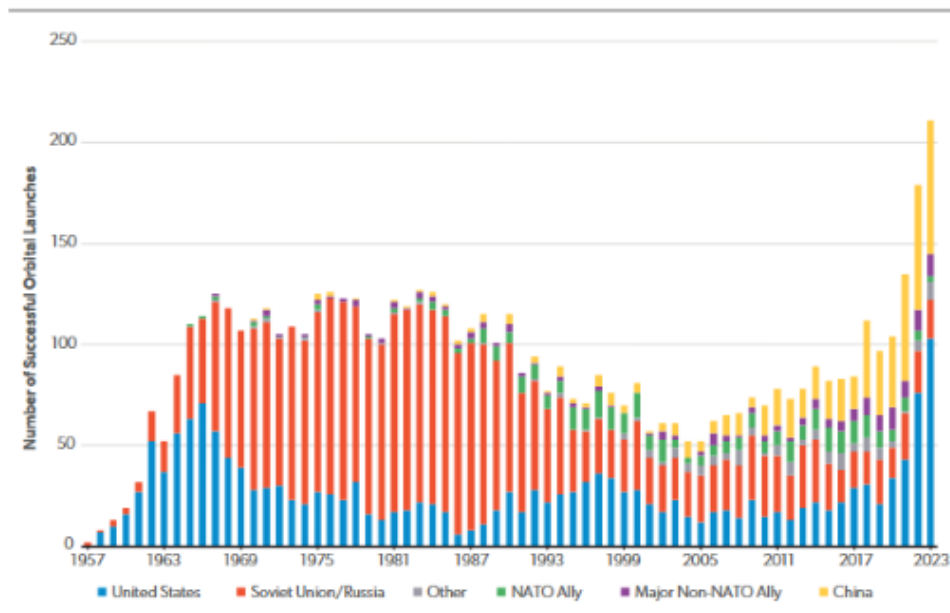
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Link: <https://stratheaia.com/from-water-sharing-to-strategic-stability/>

Op-ed | Third Space Age: Profit, Power, and the Perils of Commercialization

Areesha Manzoor

For most of the Space Age, orbit was the exclusive province of superpowers, the US and USSR, during the Cold War era. Now, it has become a marketplace with many commercial actors. “Third Space Age” is characterized by the commercialization of space after the invention of reusable rockets and mega-constellations. In 2025 alone, the countries attempted 329 orbital launches and deployed 4,522 satellites, an eightfold increase from the 580 satellites launched in 2019. Commercial companies carried out roughly two-thirds of that total, with governments launching directly only 99 times. This is not simple stats; instead, it is a structural revolution that is reshaping the security architecture of space faster than international law can follow. A single company is dominating the launch industry because of its reusable rockets. According to Jonathan’s Space Activities Report 2025, (a credible source tracking space objects and releasing an annual report since 2014), 182 launches of the US in 2025, 165 were SpaceX Falcon 9 missions. The number comprises more than that of China (92), Russia (17), and Europe (8) combined. The US deployed 3,725 satellites that year, China deployed 371 and Russia, 87. SpaceX is the engine of that dominance. By December 2025, SpaceX had launched 10,801 Starlink satellites, with 9,399 operational, making up 58% of all working satellites in orbit and 66% of the 14,132 active satellites tracked worldwide. The global space economy, now valued at nearly \$626 billion with a 78% commercial share, is projected by the World Economic Forum to reach \$1.8 trillion by 2035. Cheaper and more frequent access to space has drawn in new commercial actors into space for services such as Earth observation, in-orbit servicing, and eventually mining and manufacturing. It has completely overturned the old assumption that states hold a monopoly on reaching orbit.



Commercialization of space has many security implications at the international level. Firstly, it has challenged states monopoly in outer space. Now, commercial actors play a consequential role in outer space politics. Secondly, there is a clear fusion of commercial and military space infrastructure. The most notable incident happened during Russia’s February 2022 invasion of Ukraine. SpaceX deployed Starlink terminals within days, and the network quickly became a warfighting tool rather than a support service. Starlink provided imagery to Ukrainians that enabled battlefield communications, drone navigation, and artillery-targeting coordination. A Russian foreign ministry official threatened to attack commercial space systems like SpaceX and said that commercial satellite systems “may become a legitimate target for retaliation.” SpaceX participation in war and Russian response highlighted private space systems as legitimate military targets under certain conditions and blurred a line that international law never anticipated.

The US formalized this blurred distinction of private and state actors. The Pentagon’s 2024 Commercial Space Integration Strategy showed its commitment to integrate private space capacity directly into national security architecture. This strategy declares that there is the possibility of using military force to protect commercial operators in conflict. Within two years, 2024-2026, 13 batches of Starshield satellites were launched under the National Reconnaissance Office (NRO), built on the Starlink design. In 2025, the US launched 150 defense-classified satellites, 43 for China and 18 for Russia. Commercial space has become a principal delivery mechanism for national security purposes, without any accompanying international framework establishing how such assets should be treated, protected, or attacked.

States are also mindful of protecting their spatial data and sovereignty amid intensifying commercialization of space. States are not perceiving commercial space actors as benign and peaceful; rather, they are cautious about surveillance and data sharing through commercial actors. One such notable incident occurred when Iran filed a complaint against SpaceX Starlink in the International Telecommunication Union (ITU) for unauthorized operation in Iran. In 2023 and 2024, ITU gave rulings in Iran's favor. Iran has also blocked unauthorized Starlink signals in early 2026 during a protest. Another notable incident was when India withheld the final security clearance and approval for Starlink to operate in India. It is a reaction to the use of unauthorized Starlink satellites during the ongoing US-Israel war on Iran. These events highlight increasing consciousness of states regarding the military role of commercial actors in space.

Commercialization has a direct physical hazard impact as well. Outer space is becoming congested with an increasing number of satellites and actors. Reusable rockets have reduced the cost of launch, which has accelerated the rate of satellite deployments, increasing congestion. More satellites are orbiting Low Earth Orbit (LEO), which increases the chances of collisions. According to the European Space Agency's (ESA) Space Environment Report, LEO debris density has reached a critical threshold after a 20% increase in collision risk. Thus, private space actors in outer space have augmented the probability of Kessler's syndrome, a hypothetical scenario where the density of objects in low Earth orbit (LEO) becomes so high that a single collision triggers a runaway chain reaction.

The legal architecture governing all of this dates to 1967. The Outer Space Treaty (OST) declares space the "province of all mankind" and bars weapons of mass destruction from orbit. Still, it was written for a world of two spacefaring governments and not thousands of private satellites, a single company's mega-constellation, and a defense establishment that now depends on that company to fight wars. None of these argue for a retreat from commercialization; they argue for governance catching up to the needs of the third-space age.

States need to address the modern-day challenges of outer space with a multipronged approach. First, states shall modify the OST with an instrument addressing private operators directly (limitations, rights, and disposal standards). Second, states need to build binding orbital traffic-management rules among major spacefaring states, rather than waiting for full UN consensus.

Third, states shall establish a clear, agreed process for classifying commercial satellites drawn into military use, so it is easy to improvise rules of engagement in real time. In a nutshell, space is no longer an arena for states only. Non-state actors are also playing a significant role by providing services to states. Innovation and reduced costs are at the core of the functioning of the non-state actors. Some states relegate security tasks to these companies; others feel a security dilemma and consider private actors as offensive. The situation has outgrown the existing space governance framework. There is a need to evolve space laws according to the increasing diversity of space actors and their complicated role.

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Link: <https://strafasia.com/third-space-age-profit-power-and-the-perils-of-commercializationareesha-manzoor-1786965743695>

Op-ed | Mecca Defense Pact and the Question of Islamic NATO

Nawal Nawaz

On Aug 7, Pakistan, Turkiye, and the Kingdom of Saudi Arabia (KSA) signed a mutual defense agreement, committing the three nations to treat “an armed attack against one as an attack against all”. The significance of the Mecca defense pact can be gauged from the fact that this trilateral defense pact brings together a leading oil-exporting nation- KSA- NATO’s second-largest army-Ankara, and the only Muslim nuclear-armed state- Pakistan, spanning the three countries across the Middle East, South Asia, and Europe. Together, these three armies form a sizeable military bloc, combining nearly 1.4 million active military personnel, 3400 aircraft, 6000 tanks, and more than 340 naval assets, consolidating the defense pact as the most significant geopolitical development influencing the strategic landscape of the Middle East and beyond. All the parties to this trilateral arrangement commit that the pact is not against any country and that the nature of the agreement is purely defensive, serving solely as a deterrent against external aggression and open to other brotherly states seeking regional peace and security.

Islamabad and Riyadh had already signed a Strategic Mutual Defence Agreement last year, and with the inclusion of Turkey, the bandwidth of the alliance has been widened, augmenting the collective strength of these three states into a formidable force in the region. At the heart of this tri-lateral defense agreement lies the complementary strength of Saudi’s capital, Turkiye’s technological advancement and Pakistan’s outstanding military power, placing collective defence at the centre of this tri-lateral arrangement. Though the Turkish Foreign Minister described the mechanism of the mutual defense agreement as technically comparable to Article 5 of NATO; however, there is no provision in this framework that automatically translates military commitment of the sort people often imagine when they think of “NATO”.

Though it remains silent on the question of where the common threat lies. The provision that “an attack against any member state amounts to an attack against all” reflects the perception that the alliance has taken the form of Islamic NATO. This proposition lacks any solid ground for its justification; in case of a war between Pakistan and India, there is no arrangement that compels other members of this tri-lateral pact to come in defense of Pakistan. The Mecca Defense Pact is celebrated as strategic hedging rather than a meaningful military pact. To

mitigate the risk of entrapment, the three states kept operational execution vague while omitting a mechanism for an automatic military response; By doing so, these states aspire to minimise abandonment while retaining the autonomy to decide their level of involvement.

It is not justified to call the Mecca agreement a military bloc like NATO, as blocs derive their significance through an identifiable strategic competition: they consolidate one group of states at the expense of other states in relation to one another. All the member states of the Mecca agreement intentionally avoided giving this strategic character to the defense arrangement. Even Islamic NATO does not appropriately describe this sort of arrangement. NATO is not merely about the mutual-defense clause; it stands as a deeply institutionalized military architecture which has been built around the pillars of planning, command structures, interoperability, and an historical strategic adversary. Mecca agreement should be taken as aiming to establish collective deterrence, without wedging a new geopolitical division line. More than the arithmetic of tanks and aircraft, the trilateral defense pact reinforces strategic reassurance within the three partners while accentuating the costs and uncertainty associated with aggression against any one of them.

Mecca agreement reiterates the fact that in a multipolar order, great powers are not losing their significance; however, the middle powers are becoming reluctant to outsource their security to these influential powers. Through the Mecca agreement, three states aspire to establish deterrence without requiring an enemy to define it.

The question of what compelled these three states to sign this agreement grabs the attention of the international community. After the erosion of the US security assurances in West Asia, Gulf States had realized the need to transform their security and development model away from the US, grounding it in taking greater responsibility for their own security frameworks. On Sep 9, 2025, Israel, the closest ally of the US, attacked Qatar, which hosts the largest US military base in the region with ballistic missiles, questions credibility of the US security commitment to its Gulf allies. Likewise, the five-month Iran-US war has eroded the security architecture in the region, forcing Gulf allies to reconsider decades of conventional wisdom grounded in the US military supremacy.

The defense pact has been welcomed by most of the Arab countries, including Bahrain, Kuwait, and Somalia. In addition to Gulf states, the Organization of Islamic Conference (OIC), a 57-

member states group, has also hailed this initiative. Iran welcomed the initiative and the expansion of this alliance, and Turkiye expects Egypt to be the next state joining this initiative. However, tensions between Riyadh and the UAE escalate, with prominent Emirati and Saudi voices publicly clashing over the kingdom's decision to pursue a new regional security partnership beyond the Gulf Cooperation Council (GCC), which includes energy-rich monarchies of Bahrain, Kuwait, Oman, Qatar, Saudi Arabia and the United Arab Emirates. Kingdom of the Emirate aptly pointed out the rationale behind signing this accord, pointing out that the success of any agreement hinges on the common enemy, and in the case of the Mecca agreement, there is no common enemy. Nevertheless, Turkish Foreign Minister Hakan Fidan clarified that the new strategic triangle is not signed against a common enemy and targets no specific state, stating the agreement is more of a signal that three states would stand shoulder to shoulder in the face of common security threats to restore balance in the region. After the failure of the GCC in implementing a joint security strategy after the Israeli attack on Qatar in 2025, this trilateral strategic pact became a necessity for deterring Israel in the region. Therefore, in the absence of security guarantees from the US in the region, there is a need for an alternative security framework; though the Mecca agreement cannot work as a substitute for the GCC or American security partnerships, the agreement could help synchronise strategically compatible smaller states. Both in terms of operation and legality, the agreement needs to work on its institutional depth, unified command structures, joint military planning and integrated logistics that form the core of a functional collective defence alliance. With the joining of more states, this trilateral strategic arrangement could grow into a wider, regionally owned security platform assuring sustainable and holistic regional security architecture for West Asia.

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Link: <https://cscr.pk/explore/themes/defense-security/mecca-defence-pact-and-the-question-of-an-islamic-nato/>

Op-ed | Sino-Pak Strategic Partnership and the Questions of J-35 Sales to Pakistan

Abdul Moiz Khan

Debate continues over whether China is willing to supply Pakistan with its fifth-generation J-35 stealth fighter. Skeptics contend that Beijing is unlikely to export one of its most advanced combat aircraft while the People's Liberation Army Air Force (PLAAF) is still expanding its own fleet. They further argue that China's growing security commitments in the South China Sea, make such a transfer improbable. These arguments, however, treat the J-35 as an isolated arms sale rather than the product of a much broader strategic relationship.

Pakistan-China Strategic Partnership

The prospective transfer of the J-35 should instead be viewed in light of the evolution of the China-Pakistan strategic partnership. Initially, the partnership focused on military equipment sales; however, it now includes joint production projects, such as the JF-17 Thunder fighter aircraft, Tughril-class frigates, and Hangoor-class conventional attack submarines. Through these projects, Beijing has also helped Pakistan strengthen its indigenous defense industrial capabilities. Beyond this, Pakistan's acquisition of J-10 C multirole fighters, HQ-9 air defence systems, and PL-15 beyond visual range (BVR) air-to-air missiles points towards Islamabad's operationisation of an increasingly interoperable Chinese-origin military ecosystem.

In addition to procuring J-35 aircraft, reports have also suggested that Pakistan is interested in purchasing the KJ-500 Airborne Early Warning and Control (AEWC) aircraft and the HQ-19 missile defence system. Overall, these purchases showcase both Pakistan's growing strategic needs and the further strengthening of an already established strategic relationship between the two partners.

Moreover, an important factor in Pakistan's interest in buying the F35 fighter jets is India's decision to acquire an additional 114 Rafale jets, in the aftermath of Operation Sindoor. A few of them will be built in France, and the remaining 94 will be assembled in India, thereby allowing the Indian Air Force (IAF) to deploy them quickly. This is likely to be the case, as once these jets are manufactured on assembly lines in India, the IAF will be able to pour more

resources into rolling out the remaining airframes in quick succession. In this regard, J-35 fighter jets would provide Pakistan with a crucial conventional deterrent against growing Indian capabilities. Pakistan's strategy is to maintain a qualitative parity with India instead of a quantitative equivalence thus focuses on technological offset rather than engaging in an arms race.

Broader Implications

Critics also argue that China is not interested in selling the J-35 because it will not allow its sensitive technology to be placed beside American aircraft and technicians at Pakistani airbases. The argument is that such a scenario would allow US personnel to be in proximity to the J-35, which China did not want in the first place. However, this would not seem to be case given that Pakistan has been maintaining both the US and Chinese weapon systems for decades, with neither side raising any alarms or concerns publicly. Pakistan has been operating a fleet of American F-16 jets for almost four decades now and also has a fleet of Chinese J-10 C fighter aircrafts. If anything, this would imply that Pakistan has a certain level of trustworthiness in navigating US-China tensions. In fact, Pakistan played an important role in facilitating US-China normalization during the cold war and has maintained close relations with both states.

Critics also argue that China is likely first to fulfill its own requirements amid emerging threats in the South China Sea Theater. This seems natural if Beijing decides to do so; however, given its growing capabilities in the aviation industry and the wherewithal it possesses, it will not be difficult for China to produce 40 airframes for Pakistan as well in due course.

In view of the ongoing rumors and misinformation, the statement delivered by the Chinese ambassador to Islamabad at the 99th anniversary commemoration ceremony of the founding of the People's Liberation Army (PLA), held at Pakistan Army Headquarters in Rawalpindi, is a very telling example of China's official position regarding Pakistan as a strategic ally. On this occasion, the ambassador said "Pakistan armed forces and the PLA are true partners, bound by mutual trust, unwavering support and a shared commitment to regional peace, stability and the protection of common strategic interest." This statement confirms China's steadfast position of standing beside Pakistan and advancing common goals.

Besides all this, the global reputation China has garnered from Pakistan's successful use of its technology in active combat, coupled with Beijing's expanding aerospace defense industry, makes Islamabad an understandable choice for exporting its prized systems. Moreover, India's growing conventional counterforce capabilities have also become a common concern. Although, India and China has good relations that are improving over the past few years – Beijing prioritizes its strategic partnership with Pakistan. Within this context, the J-35 represents an important step in an evolving security partnership that advances the long-term strategic interests of both Beijing and Islamabad.

Thus far, the debate over the transfer of J-35 jets had hinged more on China's capability and willingness to do so. However, the trajectory of the Pakistan-China strategic relationship, Pakistan's defence needs, and the broader geopolitical environment seem to suggest that Beijing has much to gain from this deal. For Pakistan, the acquisition of fifth-generation fighter aircraft is a strategic necessity to maintain a qualitative balance instead of a quantitative one in the region, especially given the growing willingness of India to engage in conventional warfare under the nuclear overhang. The sale of J-35 to Pakistan reflects the emergence of a more integrated defence relationship between the two countries; one shaped by converging strategic interests in the region. Furthermore, with the lack of conditions attached to this weapon sales, China seems to increasingly view Pakistan as a trusted defence partner.

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Link:<https://www.internationalaffairs.org.au/australianoutlook/sino-pak-strategic-partnership-and-the-questions-of-j-35-sales-to-pakistan/>

Op-ed | ISRO's Quiet Loss of its Critical Asset

Areesha Manzoor

The Indian Space Research Organization (ISRO) is facing continuous losses. The consequences of the failure of satellite launch vehicles were not over when ISRO faced another setback. Early this year, hundreds of its scientists and technical staff either resigned or took voluntary retirement from ISRO. The state responded vehemently, and the Department of Space issued a memorandum in July 2026 that stripped the directors of ISRO centres of the power to accept the resignations of “Group A” scientific staff. According to the new rule, requests for voluntary retirement and resignation from personnel on Gaganyaan and other “strategic missions” now have to go through Delhi for a final decision. The resignation of more than 100 critical scientific staff is not the result of a sudden blow or any conspiracy, but rather a reflection of deeply rooted structural fault lines and the outcome of the state’s policies.

The state’s monopoly could not achieve Indian space aspirations, so the government expanded space for private companies. The entire space value chain was opened to private players in 2020 by establishing the Indian National Space Promotion and Authorisation Centre (IN-SPACe). It acts as a bridge between ISRO and private space companies. Furthermore, it authorizes private satellite builds, launches, and space-based applications. It also facilitates the sharing of government-controlled space facilities. In 2023, India released its Indian Space Policy that explicitly opens the national space sector to non-governmental entities (NGEs), allowing private companies to build rockets, manufacture satellites, offer commercial launch services, and undertake space exploration.

In 2014, one company, Skyroot, set the foundation for the commercialization of space in India, which has now grown into an ecosystem of 440 registered companies. By March 2026, these space start-ups have attracted investment worth \$618.5 million, with nearly \$150 million in 2025 alone. Some of the leading space companies are Skyroot Aerospace, Bellatrix, Pixxel, Dhruva Space, and Agnik Cosmos. However, the commercialization of space in India backfired and ultimately led to a crisis of exodus of the scientific community from the government space agency. The problem is not commercialization itself but the lack of reforms in government space agencies.

The state did not anticipate that the private sector would grow to a point to be able to replace the state with the same engineers that have been created. The scientists who are leading such smaller companies like Skyroot and Agnikul are trained by ISRO. Those companies provide more incentives such as better salaries, more compensation, equity, and exposure throughout a career, compared to what ISRO can offer. It is not the traditional brain drain of scientists going to the West. It's a lesser sin: the state paid and suffered.

The departure of scientists did not cause structural faults, but it exposed decades-old bureaucratic systems. Centralisation of ISRO's decision-making process is directly proportional to the structural constraint upon the serving people. Several current and former officials underscored the role of the increasingly bottlenecked Chairman's Office as the cause of distress. Other factors add fuel to the fire, such as career mobility being slow and rank-bound. It was the only thing that was a secure option for an Indian aerospace engineer in the past. The norms that determine pay are set by civil service norms and not contemporary stock options. Now, exit from the service itself is bureaucratized to a questionable extent. An organisation that has failed to retain its talent by providing opportunities is trying to bind people through paperwork, and disguising it as policy.

Commercial actors work on the logic of incentive and government-run bodies on the rules of bureaucracy. Innovation comes from incentive and risk-taking and not from a bureaucratic model of obedience. On the other hand, government agencies are founded on caution and accountability, since they are held to Parliament, not to a board seeking to raise the next round of funding. Thus, freezing resignations is a few quarters' time only.

This isn't a domestic issue; rather, it has strategic consequences. Scientists who left are well-trained and well-equipped for major Indian space programs like Gaganyaan, dual-use satellites, and launch capabilities. The institutional memory, tacit knowledge, and mission-specific judgment of these programmes are impossible to replace; it takes years of onboarding to develop. It will take decades to recruit people of similar intellect and knowledge and train them for future projects while maintaining the centralized decision-making process. Hence, the cost that India has to pay is waiting. Gaganyaan, Chandrayaan-4, as well as Bharatiya Antariksh Station are delayed because of the same stressed human resource. It highlights the disconnect between India's "space goals" and its capacity to achieve them. In a nutshell, the July 14 memo focuses more on administrative posture rather than addressing structural faults. ISRO is facing

the consequences of its structural flaws and immature policies. Commercialization of space is a global phenomenon, yet the state's loss of its own talent at the hands of its own private companies is no less than a nightmare come true for India. The state's difficult and crushing exit system from ISRO will also decrease entry into the organization. Young talent does not limit itself to one institution; they go for incentives and flexible workplaces. This is what deprives the state of talent and expertise.

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Link: <https://cscr.pk/explore/themes/defense-security/isros-quiet-loss-of-its-critical-asset/>

Op-ed | Layered Transformation in the Indian Army

Syed Ali Abbas

The shift of India's military transformation from concept to structure is underway. The first Integrated Battle Groups (IBGs) are now operational, theatreisation proposals are in final government discussions, and 2026 is being pushed as the Year of Networking and Data Centricity, so what seemed like a series of separate enhancements looks now like a unified redesign. Theatreisation, IBGs, Rudra Brigades, Bhairav and Baaz Battalions and longer-range precision systems are all significant changes to the way the force commands, packages combat power, and turns information into effect. This shrinks the time gap between political decisions and military action across three interconnected layers – command integration (coordination delay); combat restructuring (force-assembly delay); sensor-to-strike integration (engagement delay). The primary concern for Pakistan is whether the reforms increase New Delhi's capacity and capability to produce prompt and calibrated conventional effects in a crisis.

Command: Moving towards Integration

The theatreisation is the first layer, which seeks to move away from inter-service coordination to integrated operational command. The model distinguishes Raise-Train-Sustain from force-employment. Theatre commanders will have operational autonomy over their under-command land, air, maritime and assets in assigned theatres.

It's common practice around the world. Services coordinate, train and equip, and theater commanders exercise operational control. A similar approach is being followed by the United States, and China has also introduced theatre commands replacing military regions to enhance effectiveness of joint operations. India is seeking a comparable approach with plans centered on three theatres – one relating to China, one to Pakistan and one maritime. The proposal was developed following wide consultations by service chiefs and the CDS and is currently being considered by the Government.

Yet, it is not enough to simply redraw the command boundaries for jointness to be achieved. It demands joint planning, an integrated operating picture, joint logistics, coordinated air and long-range fires, and access to cyber, space, and electromagnetic capabilities. As demonstrated

in Russia, new command posts are not enough to produce jointness. Advantage is only gained if the commands have real authority, information is reliable, scarce resources can move along axes. India is making command itself a source of speed, which embeds joint integration earlier in the operational timeline, reducing the Observe-Orient-Decide-Act (OODA) loop at the operational level.

Combat: Creating a Graduated Spectrum of Force

The second layer alters the formations in which the commanders can fight. IBGs, Rudra Battalions, and Bhairav Battalions sit at various ends of a spectrum of size, autonomy and mission. For rapid commitment and combined arms operations, IBGs deployed under formations like the XVII Mountain Strike Corps contain more than 5,000 personnel including infantry, armour, artillery, air defence, engineers, signals and their organic logistics.

Rudra Brigades operate at tactical level, as all-arms formations, with supporting arms and unmanned systems for multi-domain operations. Although they are dependent on higher echelons for sustained firepower and reinforcement, but still, they can still deliver the initial punch on their own. The Indian army by mid-2025 had already converted two brigades and more were planned.

Bhairav Battalions are a unique category, each with a strength of about 200-250, to link Ghatak platoons and Special Forces units. By late 2025 the Army had already created the first five of the 25 planned battalions, providing brigade and divisional commanders with a force that they could use for raids, reconnaissance and limited offensive operations on short notice, without involving full conventional units or deploying scarce strategic Special Forces. There is a flexible range of force with this graduation. Now the operational commander has no longer to choose either between limited infantry probes but smaller special forces packages may be used during the initial stages, and backed up with heavier groups if needed.

Sensor-to-Strike: Distributing and Connecting the Kill Chain

The third layer is to make it easier to get from detection to engagement. By October 2025, 380 infantry battalions had been equipped with Ashni drone platoons comprising 20-25 soldiers, armed with surveillance drones and loitering munitions, bringing organic sensing and strike

capabilities to the tactical forefront. In parallel, echelons of artillery and aviation are being restructured. Divyastra batteries are to reinforce the traditional artillery with loitering munitions ISR and strike operations, Shaktibaan regiments are to focus on loitering munitions with greater range and Shaurya squadrons will provide early warning to armoured formations. The newly announced Baaz Battalions under the Army Aviation aim to provide persistent deep ISR, outside the tactical drone range. Horizontal integration is taking place as well as vertical distribution.

On command and Control (C2) side the tri-services has its own have integrated their respective systems including the Indian Army's Akashteer air-defence system, , the Indian Air force Integrated Air Command and Command System (IACCS) and the Navy's TRIGUN network, providing a real-time picture to the decision makers.

Moreover, India's designation of 2026 as the Year of Networking and Data Centricity reinforces this, focusing on fusing and sharing data across services and echelons. A networked system is designed to ensure that relevant data is instantly available to commanders who can then order the most suitable effect – artillery, loitering munitions, air power or electronic attack – without the delays of having to go through multiple layers of approval.

Implications for Pakistan

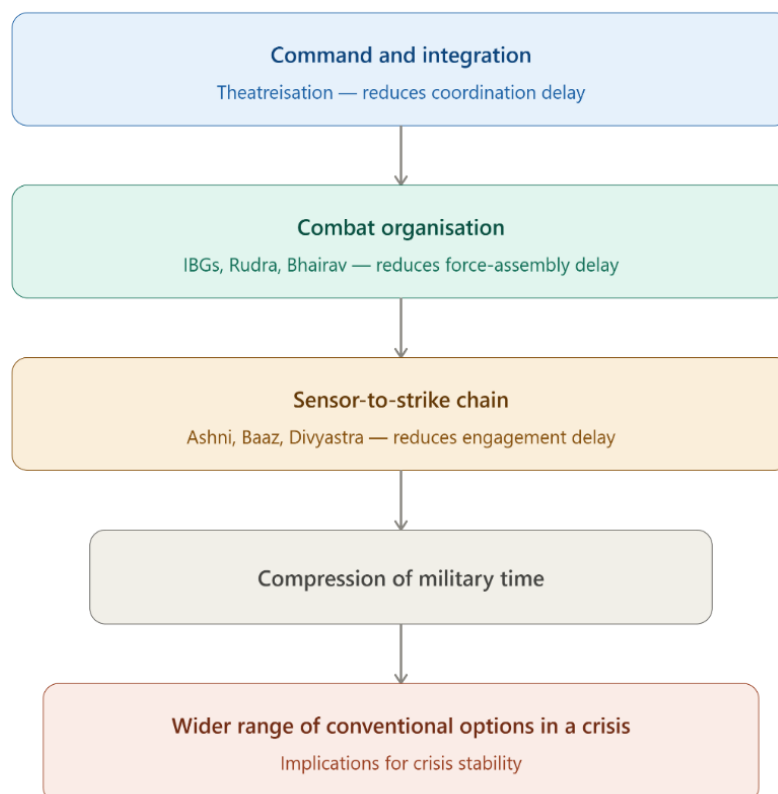
The main concern for Pakistan is whether India's reforms expand New Delhi's ability to generate calibrated conventional effects more quickly and precisely in a crisis, shrinking decision time and blurring the line between limited action and a wider conflict.

At the strategic level, rapid, graduated conventional action risks reducing crisis stability by lowering the perceived cost of limited actions and eroding the firebreak with the nuclear threshold. Pakistan's full-spectrum deterrence (FSD), crisis-management channels, and strategic signalling require continuous refinement to ensure thresholds remain clear and decision-makers retain time under compressed timelines.

At the operational level, shorter Indian force-generation times and higher early precision effects pose the primary challenge. Pakistan must further enhance its resilient, dispersed command and control under disruption, strengthen the integration of air defence with ground and

electronic warfare assets, and maintain the capability to shift reserves without depending on single nodes.

At the tactical level, units will face denser unmanned surveillance, loitering threats, and faster engagement cycles. Deepening decentralised execution, small-unit electronic camouflage, and organic counter-UAS training will ensure frontline forces can operate with less continuous higher direction while placing constant friction on opponent sensor-to-strike links. Across all levels, Pakistan's approach must prioritise denying confidence in quick, controllable gains, ensuring any initial advantage in speed or precision is offset by higher costs, operational uncertainty, and credible counter-options.



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Link: <https://defensetalks.com/three-layers-of-transformation-in-indian-army/>

Op-ed | The Risk of Cyber-Nuclear Escalation:

The Kudankulam Breach

Muhammad Ali Baig

In July 2026, the ransomware group World Leaks published around 19,000 files from a collection of documents related to the Kudankulam Nuclear Power Plant (KKNPP) in India. It is the country's biggest nuclear power plant. The leaked documents reportedly included engineering drawings, supplier data, inspection records, and internal documents from 2016 through 2025. This is the case of cyberspace where cyber-attacks add to the uncertainty of attribution, intent and thresholds of escalation. Such uncertainties can lead to misjudgment and a disproportionate military response, particularly if there is simultaneous conventional military crisis development.

A prism to analyze this case study is the linking up of conventional strategic nuclear risk. Here, overlapping physical infrastructure, data pipelines, software, vendors, and cloud services rely on both conventional and nuclear command, communication, and support. An attack against a non-nuclear or commercial network may therefore be of nuclear interest if it impacts nuclear infrastructure facilities, information or support. This is possible even if the attacker/ hacker is not interested in escalating a crisis.

The attribution dilemma also leads to legal and strategic uncertainty. The difficulty in cyberspace to establish who is behind an operation, what it was for, and whether the event was an espionage, a criminal extortion, a sabotage or a state-directed coercion. This opacity increases the chances of unintended escalation, particularly if kinetic, informational, or electronic-warfare aspects are integrated into hybrid operations. It also reiterates the importance of establishing more precise legal limits and risk management measures that can safeguard civilians and critical infrastructure in societies that are highly digitalized.

The Kudankulam case raises an important aspect about the cyber-nuclear nexus security threats i.e. a cyber-attack doesn't have to get into the command and control systems of a nuclear plant to have strategic relevance. This was not an issue with the plant's operational technology or reactor-control systems, but rather a server that was managed by a contractor that lacked sufficient cybersecurity measures. If nuclear-adjacent facilities use commercial cloud services,

contractor networks, supplier ecosystems, and information-technology infrastructure with normal civilian industry, a break in that ecosystem can find its way to nuclear relevance. This is more of an infrastructure-governance issue. It is also a supply-chain-security issue rather than any act of nuclear escalation by any specific actor.

From this cyber-nuclear entanglement, there are two lines of risks. First, there is the threat of symbolic escalation due to cyber-attack. The disclosure of a breach at a publicly known “nuclear” location could be seen by its own citizens rather than its adversary as more significant than the content of the incident itself. This can put domestic political pressure on a response (for gaining political sympathy for elections, false flag operation against Pakistan etc.) even if the exposure is only administrative or engineering information. This risk can be exacerbated by media framing. Tackling a hacking incident at a nuclear plant, rather than a cloud server hack, could influence initial perceptions among officials and the general public, even before facts of the hacking incident are known. Second, there is the attack-surface risk. A contractor/vendor system may be less secure, and less continuously monitored, than the facility’s main systems. They can thus offer plausible scenarios for future intrusions that could have more significant consequences. The security of sensitive information, risk management, defence in depth, supply-chain security, incident response, and security responsibilities for third-party parties are emphasized in IAEA guidance on computer security at nuclear facilities, not just the operator. The central issue brought up by Kudalkulam is thus whether the issue is a failure of existing norms or a failure to apply otherwise satisfactory security norms.

Meanwhile, a strict assessment of cyber-nuclear alarmists should not be avoided. Breaching nuclear-adjacent facilities may lead to nuclear alert level escalation. South Asia, where there are no strategic-restraint mechanisms, diplomatic channels and military communication arrangements which can prevent escalation. one cannot hold to the cold war history examples to avoid military crisis. The 1983 Able Archer exercise and the incident involving Stanislav Petrov’s response to a false warning are used to illustrate how judgment, verification and institutional restraint can avoid reflexive escalation even when time is of the essence.

The analytical task that is relevant is thus to balance the cyber-nuclear entanglement thesis with the strategic-restraint mechanisms’ resilience. Ambiguity is not enough just by showing what shared infrastructure can. A convincing argument should highlight the change today such as AI-powered faster decision cycles, automated initial assessment of incidents, the reduced

ability to verify, or cyber interference on communication and early-warning systems. The changes may result in more serious future incidents than previous crises in which people had more time and information to make decisions. To sum up, the Kudankulam breach is a worrying example of the structural conditions for cyber-nuclear entanglements in South Asia. It reflects how nuclear-adjacent facilities could be vulnerable due to standard commercial infrastructure, contractors, and shared digital ecosystems. It's not the incident itself that constitutes an imminent nuclear crisis; it's the line between conventional cyber risk and nuclear risk which is closing by design. The Indian government should exercise maximum care and security in ensuring the prevention of such lapses.

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Link: <https://ipi.org.pk/the-risk-of-cyber-nuclear-escalation-the-kudankulam-breach/>

Op-ed | The Makkah Agreement and a New Model of Regional Security

Syed Ali Abbas

The Makkah Joint Defence Agreement between Pakistan, Saudi Arabia and Türkiye marks an important shift in regional security cooperation. The three countries have agreed to support one another without defining a permanent threat. Each state will retain its existing alliances, partnerships, and foreign-policy priorities. The agreement therefore creates a shared defence framework without requiring political alignment on every regional issue. It also places Pakistan at the centre of a wider security relationship linking South Asia, the Gulf, and Türkiye.

The main significance of the agreement lies in this flexibility. Pakistan, Saudi Arabia, and Türkiye operate in different strategic environments and have different security priorities. The Makkah Agreement allows them to cooperate on defence and deterrence, build their capabilities, and preserve their different strategic priorities. This makes the arrangement well suited to a regional environment in which states increasingly prefer multiple partnerships.

From Bilateral Ties to a Shared Framework

Pakistan, Saudi Arabia and Türkiye entered the Makkah Agreement with established military relationships and regular defence contacts. Pakistan and Saudi Arabia have conducted several bilateral exercise series, including Al-Samsaam and Al-Kassa, focused on counterterrorism, urban operations, route clearance and counter-IED training. In November 2025, personnel from Pakistan's Special Services Group and Saudi forces also conducted the Al Battar-II exercise in Tabuk. Their defence relationship is further supported by longstanding training programmes, military exchanges and high-level military contacts. Pakistan's wider role in regional security is also reflected in the Islamic Military Counter Terrorism Coalition (IMCTC), headquartered in Riyadh. Since 2017, the coalition has been led by former Pakistan Army Chief General Raheel Sharif, a retired four-star general.

Pakistan and Türkiye have also developed regular military cooperation through joint exercises, training and defence-industrial engagement. The Atatürk exercise series provides a continuing platform for special-forces cooperation. Atatürk-XIII, held in Pakistan in February 2025, brought together Pakistan's Special Services Group and Turkish Special Forces for two weeks

of counterterrorism training. The three countries have also trained together in broader multinational settings. Indus Shield 2024, hosted by the Pakistan Air Force, included both the Saudi and Turkish air forces among participants from 24 countries.

These engagements show that the Makkah Agreement builds on an established pattern of military cooperation. It brings existing bilateral ties into a shared framework and creates greater scope for coordinated training, defence cooperation and capability development.

Complementary Capabilities and Capability Development

The Makkah framework brings together three complementary defence capability profiles. Saudi Arabia provides the strongest financial base, a large defence market and a growing emphasis on localization under Vision 2030. The Kingdom allocated about \$78 billion to the military sector in its 2025 budget, while the localization of military spending reached 24.89 per cent by the end of 2024, with a target of more than 50 per cent by 2030. This creates scope for joint ventures, licensed production, maintenance facilities and technology transfer with Pakistani and Turkish defence firms. Saudi Arabia can therefore provide the capital and market scale needed to support major joint programmes.

Türkiye contributes the most advanced high-technology defence-industrial base of the three. Its defence and aerospace sector records around \$10.05 billion in exports, with more than 3,500 companies operating across unmanned systems, missiles, electronic warfare, radar, air defence, naval platforms and combat aircraft programmes. Systems such as the HİSAR and SİPER air-defence families, ATMACA and ÇAKIR cruise missiles, ASELSAN radar and electronic-warfare systems, and the MİLGEM naval programme illustrate the depth of its industrial and technological capacity.

Pakistan contributes operational experience, military training capacity and an established defence-industrial base in combat aircraft production, avionics, maintenance and naval construction. Pakistan Aeronautical Complex produces the JF-17 multirole fighter and maintains dedicated overhaul facilities for the aircraft. PAC has also produced more than 100 military jets and 345 trainer aircraft. Pakistan's experience with the JF-17 programme and local construction under the MİLGEM project demonstrates its ability to absorb foreign technology, integrate it into domestic production and sustain complex defence platforms.

The Turkish KAAN fifth-generation fighter programme illustrates how these capabilities could be combined. Saudi Arabia has held advanced discussions with Turkish Aerospace over participation in the programme, while Pakistan has also been linked to possible co-production and industrial cooperation. A trilateral model could combine Saudi investment and procurement capacity, Turkish aerospace technology and programme leadership, and Pakistani manufacturing, integration and operational experience. This would move cooperation beyond arms procurement towards joint investment, technology sharing, production and long-term capability development.

Pakistan and Türkiye already have a working model for this type of industrial cooperation. Under the MİLGEM programme, two corvettes for the Pakistan Navy were built in Türkiye and two in Pakistan, with technology transfer and local construction included in the arrangement. The programme demonstrates how defence ties can move from a buyer-seller relationship towards co-production and industrial participation. Similar models in aerospace, missiles, unmanned systems, air defence and naval technologies could allow the three countries to pool capital, technology, production capacity and operational experience.

The Makkah framework can therefore provide a political basis for deeper defence-industrial cooperation. Saudi Arabia can provide financing and scale, Türkiye advanced technology and systems, and Pakistan manufacturing capacity, training, maintenance infrastructure and operational experience. Together, these strengths can support indigenous capability development and sustained trilateral defence cooperation.

A Flexible Regional Framework

The Makkah Agreement does not require its members to abandon their existing strategic relationships. Saudi Arabia will retain its close security ties with the United States, Türkiye will remain within NATO, and Pakistan will continue its partnerships with China, Iran and the Gulf states. The agreement adds another layer of cooperation while allowing each state to preserve its own foreign-policy priorities. This gives the framework the flexibility to accommodate different threat perceptions and regional interests.

Pakistan holds an important position within this arrangement. Its established military ties with Saudi Arabia and Türkiye, strategic location between South Asia and the Gulf, and ability to maintain working relations across region give it a wider role in the framework. Makkah also reflects Pakistan's growing relevance beyond the traditional South Asian security context. The significance of the agreement therefore goes beyond a collective-defence commitment. It brings together three states with different alignments and complementary capabilities under one security framework. Its value will lie in how effectively they use this framework for deterrence, capability development and sustained defence cooperation. If that approach continues, Makkah could offer a practical model of regional security cooperation based on shared interests without requiring fixed political blocs.

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Link: <https://westasiawatch.com/opinion/the-makkah-agreement-and-a-new-model-of-regional-security/>

Op-ed | Beyond Deterrence: The Case for arms control in South Asia

Murad Ali

Pakistan-India's crises, since 1998, demonstrate compelling evidence that nuclear weapons have not prevented small scale conflicts in South Asia. Most importantly, the May 2025 crisis evolved into the most serious military standoff since the 1971 war, in which for the first time, both countries exchanged missile strikes against each other's counterforce targets across the international borders. Each subsequent crisis has maintained a progressively precarious limit than the previous ones. It demonstrates an unstable deterrence equilibrium incapable of self-managing and depicts a growing pattern of escalation in which each crisis extends the limits of what both sides conceive as militarily and politically rational. Considering the 2019 Balakot crisis and then followed by the May 2025 episode, the trajectory of these escalations has been carried out by India who initiated each round of military action against Pakistan.

India has deployed approximately 80 percent of its offensive military capability toward Pakistan, regardless of the development along the Sino-Indian border. India has acquired robust military capabilities touted as addressing the security challenges from China, but each one has been deployed against Pakistan. India's two front security posture has not guided by bilateral arms control, but it has continued to modernize and grow its conventional and nuclear equipment, directed at Pakistan. In South Asia, there is no existing space for the limited conventional war under the nuclear overhang. Pakistan's declared first-use nuclear policy illustrates that because of its lower strategic depth, it cannot absorb a prolonged conventional attacks, and therefore it may go for the nuclear option if its survival becomes threatened. From this perspective, local arms limitation is an essential arrangement to ensure that Pakistan would never be compelled into such a strategic dilemma.

My sense is that a mutual restraint regime should be established on the three fundamental and mutually reinforcing pillars. First, both Pakistan and India should create a formal and pre-notified cap on troop numbers, military deployment, and the magnitude of military exercises along the Line of Control and the international border. Similarly, the DGMO hotline, established in 1971, but they are not properly operational during the crisis as expected, should be emboldened and integrated into the Nuclear Risk Reduction Center (NRRC). It should be capable of working permanently both prior and during the crisis. Third, both countries should

utilize the traditional multilateral platforms, notably the SCO for a sideline meeting to resume structural military dialogue.

Forth, both states need to establish or reestablish expert level track 2 dialogue to discuss doctrines and the role of emerging technologies. Such arrangements would gradually minimize the risk of misunderstanding and misperception and would probably lead to official level discussion and provide a foundation for other steps toward formal arms control. Establishing an official level dialogue is a heavy initiative to take immediately but track 2.0 could build trust and smoothen the pathway for the track 1.5 and 1.0 dialogue.

However, the prospect of arms control in South Asia is quite low. India is taking ahead of Pakistan in both conventional and nuclear arsenals. It is India who sets the ground for arms race in either domain. This has led to an increasingly hostile geopolitical environment in South Asia. Similarly, India is also modernizing its nuclear weapons and missiles systems. According to the Stockholm International Peace Research Institute (SIPRI), India's nuclear stock outpaced Pakistan in 2024. Moreover, considering its sea-based deterrence efforts, India has deployed three SSBNs in the Indian Ocean that's prevail the perception that it may have mated a few nuclear warheads with their launchers. Likewise, the integration of AI and cyber technology with nuclear domain is likely to undermine the strategic stability in South Asia. The deterrence in South Asia has weakened due to India's growing conventional, nuclear, maritime, and technological modernization. Its behavior from Kargil conflict in 1999 to May 2025 stand-off has consistently demonstrated India's perception of conventional campaign as a rational choice under the nuclear overhang. Consequently, it has eroded strategic stability by expanding the gap between the emerging capabilities and the regulatory mechanism designed to check them. South Asia is the world's highly sensitive nuclear flash point, bearing no space for error and adventurism. May 2025 crisis aptly revealed that South Asian strategic stability has become victim to India's irresponsible and reckless attitude. With this kind of insanity by India coupled with lack of renewed dialogues and regional arms control mechanism, the future of regional stability is precarious with recurrent confrontations.

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Op-ed | Indian Deployment of BrahMos at Sea: Implications for South Asian Stability

Abdul Moiz Khan

During the May 2025 crisis, the confrontation between India and Pakistan had remain limited to land and air domains, while in the naval domain it was only limited to signaling and positioning and not an active combat. During the start of conflict, India deployed its naval aircraft carrier INS Vikrant for four days in the Arabian Sea but later moved it back to its base in Karnataka. Pakistan Navy also undertook counter-deployments under an operational offensive-defensive posture. It dispersed its surface combatants, intensified maritime ISR, and moved its coastal missile units into a state of heightened readiness. However, there was no confrontation between the two navies during the whole crisis – which was later termed “Marka-e-Haq” by Pakistan.

However, few weeks after the announcement of U.S.-brokered ceasefire between India and Pakistan – Indian Defense Minister Rajnath Singh visited Indian Navy’s aircraft carrier INS Vikrant and issued a stern warning for Pakistan. He said, it is possible that in a next crisis with Pakistan, the opening strikes will be done by our Navy. Since the May 2025 crisis, both states are actively investing in their naval forces to further strengthen their capabilities. Recently, the Indian Navy has announced its plan to equip more frontline warships with BrahMos supersonic cruise missile. The plan is to work towards a fleet-wide integration of the BrahMos weapon system by 2030. However, this development can also increase pressure on Pakistan to take both defensive and offensive measures to maintain naval parity in the region.

Why BrahMos Missile?

Currently, the Indian Navy operates a diverse range of missiles for anti-ship and land-attack roles. This includes BrahMos missile deployed across 20 major frontline combatant platforms, Klub-series deployed on Talwar-class frigates, Kh-35E Uran deployed on older systems, and French made Exocet missiles and American Harpoon Missiles on its diesel-electric submarines. However, BrahMos system has demonstrated its operational relevance for the Indian military after its combat use during the May 2025 crisis. Moreover, integration of BrahMos would

provide India with an indigenous option that can help reduce its reliance on a diverse array of imported missile systems.

In 2024, the Indian Cabinet Committee on Security approved the purchase of 220 Extended Range (ER) BrahMos missiles for its naval ships. The ER-BrahMos has a range of 800km that can increase the operational space for Indian naval platforms against Pakistan Navy and also engage coastal targets without getting very close to Pakistan. Moreover, BrahMos is a supersonic missile with a speed of around Mach 3 reducing time available for adversary to detect, identify and respond to the incoming missile. Also, the precision-strike capability of BrahMos provides a major advantage while targeting moving naval platforms. Because of indigenous production, range, precision and speed, BrahMos has emerged as a major weapon for India and an ideal candidate for deployment across all its naval platforms.

To achieve its target, the Indian Navy is equipping its older and smaller naval vessels with BrahMos launchers, as evidenced by its replacement of the P-15 Termit with 4 twin-tube BrahMos launchers on Veer-class corvettes, starting with INS Vidyut. The latest Indian warships including Nigri-class stealth frigates, INS Udaygiri, INS Himgiri, and INS Mahendragiri are equipped with eight vertically launched BrahMos missiles. All four Indian advanced project 15B Destroyers carry 16 BrahMos missile each. Indian Navy is also planning to retrofit its older warships with BrahMos systems to achieve system-wide integration. Moreover, India has also successfully tested BrahMos missile from an underwater platform, paving way for its integration with diesel-electric submarines. Further, India is developing six highly agile compact missile vessels that can carry 8 BrahMos missile each and are termed as Next-Generation Missile Vessels.

These developments have significant implications for Pakistan's Naval strategy and also regional strategic stability. Pakistan is also undertaking developments to further strengthen its sea-denial strategy. Pakistan has developed indigenous anti-ship Ballistic Missile – P282 SMASH – and integrated them with surface combatants like Zulfiqar-class frigates and Babur-class corvettes. The missile has a range of 350 km. Moreover, it has developed Harbah subsonic cruise missile and has Chinese-imported YJ-83 anti-ship cruise missile. Pakistan Navy has also tested anti-ship Air-Launched Cruise Missile (ALCM) Taimoor to strengthen its maritime capabilities. Pakistan is also working on its Defence systems by deploying CAMM-ER missiles on Babur-class corvettes and LY-80 missiles on Tughril-class frigates. Both

offensive and defensive capabilities developed by Pakistan are to maintain an operational parity with Indian navy to deny them any space for an operational combat. However, there would be certain challenges for Pakistan if India successfully integrates all its naval warships with BrahMos missile systems. This would increase pressure on Pakistan to strengthen its maritime surveillance as India would have a quantitative edge in its missile carrying naval platforms.

As the naval domain is emerging as a possible battlefield for future crisis between India and Pakistan, these developments can have serious repercussions for regional stability. Any attacks on naval systems and coastal areas carry serious escalation risks in a nuclearized environment. Indian accidental launch of BrahMos in May 2022 showcases a serious problem with command and control of this platform in an environment in which two nuclear weapon states operate. Another major problem with the deployment with BrahMos is that the missile is dual-capable in nature and can carry nuclear weapons. This conventional-nuclear entanglement further increases the risks of miscalculation and inadvertent escalation. In conclusion, the Indian deployment of BrahMos missile with all of its naval warships has destabilizing implications for deterrence stability, crisis stability, and arms race stability between India and Pakistan. Increasing the number of mobile platforms capable of conducting long-range precision strikes could create greater pressure for Pakistan to adopt countermeasures, while simultaneously increasing the incentives for pre-emption during a crisis. The combination of BrahMos's long range, high speed and dual-capable nature further complicates escalation management between two nuclear-armed states, particularly when the origin and intent of a naval strike may be difficult to determine in real time. The developments risks transforming the Arabian Sea from a domain of signaling and maneuver into a potential trigger for rapid escalation, with consequences extending beyond South Asia to the wider Indian Ocean Region.

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Artificial Intelligence, Deterrence and the Psychology of War

Syed Ali Abbas

Deterrence relies on military capability, but its effect is psychological. Nuclear weapons, missile defences, alliances and conventional forces shape how an adversary assesses the risks and costs of aggression. Bernard Brodie placed credible retaliation at the centre of nuclear deterrence, arguing that military power in the nuclear age should prevent war rather than win it. Thomas Schelling treated deterrence as an effort to shape an adversary's choices by influencing expectations about costs and consequences. The logic remains: deterrence works when an adversary judges that the risks of action outweigh the gains. Its ultimate target is the decision-maker's perception of strategic risk.

But what happens when that calculation is shaped by artificial intelligence? Militaries use AI to process military data, identify patterns, assess threats, estimate chances of success and support operational military decisions. These tools can make conflict appear more measurable and manageable. The danger is not that AI will remove uncertainty from war, but that decision-makers may believe it has been reduced. If AI-generated assessments increase confidence about losses, mission success, adversary responses or escalation, leaders may accept more military risk. AI could therefore weaken a psychological basis of deterrence by making war appear more calculable than it is.

From Data to Decisions

This shift is visible in military practice. NATO's Next Generation Targeting programme seeks to use AI, shared data and automation to cut the time from information to military decision by more than 50 percent. Its Joint ISR Asset Planner can generate intelligence-collection plans in seconds instead of requiring staff to coordinate aircraft, drones and satellites manually. Ukraine's DELTA command-and-control system is used by more than 200,000 defence personnel, while an AI model developed with NATO will analyse Russian military activity. Ukraine's AI Defence Centre is developing a system to process information across a 1,200-kilometre front and provide recommendations from frontline units to strategic command. In Gaza, the IDF says its Habsora system fuses multiple intelligence datasets to direct analysts towards relevant targets. Investigative reporting on Lavender found that it had identified about

37,000 potential targets, while officers said some reviews took 20 seconds per target. During the 2026 U.S.-Iran war, the U.S. military used Palantir's Maven Smart System, integrated with Anthropic's Claude, to analyse satellite, surveillance and intelligence data, prioritize targets and assess strikes. U.S. forces hit around 1,000 targets in the first 24 hours. The CENTCOM commander Admiral Brad Cooper said AI reduced processes that once took "hours and sometimes even days" to seconds. AI is therefore compressing the process through which information becomes military judgement and action.

The Confidence-Uncertainty Paradox

The deeper problem is that AI can give uncertain information an appearance of certainty. War produces fragmented intelligence, contradictory signals and incomplete knowledge of an adversary. AI can compress that ambiguity into rankings, probabilities or recommended actions. This makes information easier to use, but can hide the uncertainty behind it. Human Rights Watch found that Israeli digital targeting tools in Gaza used incomplete data and inexact approximations to distinguish civilians from combatants, estimate civilian presence and identify potential targets, and warned that operators could place excessive trust in unreliable outputs. Ukraine's defence AI chief has likewise warned that future systems could generate recommendations so quickly that humans may struggle to keep pace. The 2026 strike on the Shajareh Tayyebah girls' school in Minab showed a related limit of technological precision. A preliminary U.S. investigation pointed to outdated intelligence coordinates that identified the location as a military target, despite a functioning school there. More than 165 people, many children, were killed. There is no evidence that AI caused the strike, but the case shows that precise systems can produce catastrophic results when the underlying intelligence is outdated or wrong. SIPRI warns that opaque AI recommendations can bias decision-makers towards action while compressed timelines increase miscalculation. The result is a confidence-uncertainty paradox where the uncertainty of war remains, but technology can make decision-makers feel that more of it has been resolved. AI may increase confidence faster than predictability.

The Illusion of Controlled Escalation

This becomes more dangerous when greater calculability creates confidence that escalation can be controlled. A state may estimate the military effects of a strike precisely, but it cannot know

with the same confidence how an adversary will respond. Escalation is interactive: every move changes the calculations, perceptions and political pressures facing the other side. Yet AI decision-support systems can present this fluid process through probabilities, rankings and recommended options, suggesting the path ahead can be mapped. Experimental evidence suggests otherwise. In simulated military crises, five leading language models developed arms-race dynamics and escalatory behaviour, with rare cases reaching nuclear use. In another wargame involving 214 national-security experts, LLM-generated responses were sometimes more aggressive than human teams and changed significantly when the scenario changed. A separate experiment using 640 military-intervention scenarios, each tested 100 times across models from OpenAI, Anthropic and Google, found that estimated probability of victory and domestic support were the strongest drivers of recommendations to intervene, carrying roughly twice the influence of civilian deaths, military casualties, economic costs and international condemnation.

These simulations do not prove that AI will cause escalation. They show that algorithmic assessments of strategic risk are neither neutral nor stable: they vary with the model, assumptions and information provided. The danger is epistemic overconfidence: mistaking precision in calculating military options for an ability to predict the political consequences that follow. AI may help calculate the first move; it cannot calculate with equal certainty what the adversary will do next. AI can strengthen deterrence by improving surveillance, early warning, defence and decision support. The concern is not AI, but the confidence placed in what it can know. Deterrence still depends on human perceptions of risk, resolve and consequence, which cannot be reduced to data or probabilities. When better analysis creates confidence that conflict can be controlled, escalation bounded and adversary responses anticipated, the restraint produced by uncertainty may weaken. The challenge is to use AI responsibly without mistaking algorithmic confidence for strategic certainty. War may become more calculable; it will not become less human.

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Link: <https://defensetalks.com/artificial-intelligence-deterrence-and-the-psychology-of-war/>

Book Review | The Triangle of Power: Rebalancing the New World Order

Amna Saqib

The Triangle of Power: Rebalancing the New World Order is one of the earliest attempts by a sitting head of state to interpret the emerging international order after the Russia-Ukraine war. Alexander Stubb, president of the Republic of Finland and a former foreign minister, brings in a perspective of a practitioner on today's geopolitics as well as a conceptual lens on the changing world of global power. On 24 February 2022, the invasion of Ukraine by Russia marked the 'de facto conclusion' of the post-Cold War liberal order, he says. It is replaced by what he calls the 'Triangle of Power': Global West, Global East, and Global South, whose interaction will define the future international system. While the triangular structure serves as a reliable and easy-to-understand mechanism for structuring the current geopolitical landscape, it also raises key questions. Like, today's international system is more coalition and issue-based, strategic 'hedging,' and overlapping partnerships than it is geopolitical blocs. The Middle powers like Türkiye, Saudi Arabia, Indonesia, Brazil and the members of the ASEAN states often do not choose to align with one bloc alone. Thus, the framework offers analytical clarity, while also necessarily simplifying an ever-more fluid and overlapping geopolitical picture.

The book is divided into three parts and nine chapters, framed by an introduction and a concluding chapter. The first part maps the changing course from a post-Cold War order to the current disorder. The author states that Western policies, ranging from the Iraq war to the 2008 financial crisis, eroded confidence in the liberal order, and the Ukrainian situation saw the further erosion of the order is due to Russia's invasion of Ukraine. He also looks at the erosion of multilateral institutions and questions whether the international system, led by the United Nations (UN), is growing weaker due to an increase of regionalization, institutional proliferation, and lack of trust. The pillars of the liberal order were already being undermined by many of the forces reshaping world politics before the 2008 global financial crisis, Brexit, the Trump presidency and the COVID-19 pandemic. The Ukraine war is not an end to something, but rather a catalyst for something that has been evolving.

The second part reviews the Three Corners of the Triangle of Power. The Global West is depicted as politically polarized, yet having significant economic, technological, and

institutional advantages. The Global East is characterized by a focus on two leading states i.e., China and Russia, with China being the main force of the bloc due to its strong economy and technological potential, and Russia being evaluated on structural decay and military strength. The Global South, on the other hand, is defined as the mass of humanity, whose increasing economic and political strength could and will influence the new international order.

The last part of the book analyses competition, conflict and cooperation as the main dynamics of the future order. The author covers hybrid warfare, cyber warfare, disinformation, and sabotage of infrastructure as the symbols of contemporary competition and also notes Western flaws in its humanitarian response. It ends with recommendations for more robust multilateral action on climate change, trade and security, as well as for more ambitious reforms of the United Nations Security Council, with more permanent members and less abuse of the veto.

A major advantage of the book is the author's own first-hand experience. The author's justification is based on his communications with President Vladimir Putin, Xi Jinping and Trump, his engagement in European diplomacy, the 2008 ceasefire agreement in Georgia and eurozone negotiations. These experiences give the book a point of view that tends to be missing from traditional academic courses. There was also a willingness to recognize the flaws of the liberal international order, a willingness which is equally striking. He does not simply take the word of the Western media, but allows himself to voice his doubts about the Western sense of complacency, misjudgements, and double standard, making the analysis more credible.

The central idea of the book i.e., 'values-based realism' is equally thought-provoking but remains conceptually underdeveloped. The concept of strategic pragmatism and democratic values doesn't always play together. Also, the difference between the two and the revised liberal internationalism is not always apparent. Thus, it looks more like a reformulation of liberal internationalism than a new theory of realism and raises significant questions about its operation in the event of conflicts between values and strategic interests.

However, the book is not without other limitations. The West-East-South framework gives it a coherent structure, but is brought up so often that parts of the discussion become repetitive, especially the repeated suggestions for United Nations reforms. More significantly, there does not seem to be an even treatment of the Global East. While Russia is constantly analysed with a critical perspective, focusing on Russia's corruption, inefficiency and stagnation, China is

more often discussed in a descriptive and analytical way, despite its central position in the Global East. Likewise, the discussion of the Global South is still basically India-centric. Other important states are comparatively underrepresented while India is given the active role as the primary representative of the Global South. For instance, Pakistan is in a pivotal position between South Asia, the Indian Ocean, the Chinese Belt and Road Initiative and regional nuclear stability. A greater discussion of such perspectives would have reinforced the book's title as a more comprehensive representation of the Global South. While the author is critical of Western policies on topics like the Iraq war, the global financial crisis, and the lack of climate commitments, there is less consideration given to the selective application of liberal norms in other parts of the world. More attention to cases, such as the use of a liberal interpretation of the application of international norms in Indian developments in Jammu and Kashmir following the 2019 constitutional changes or the Indian suspension of the Indus Waters Treaty framework.

This would have strengthened the overall message of the book to remain consistent in the enforcement of international norms. Taken together, these limitations call for a more measured conclusion than an unqualified endorsement. The Triangle of Power is an informative, insightful and timely account of the forces changing the international order and is an invaluable lens on the state of the geopolitical transition as understood by many in the West. Meanwhile, the book's triangular structure, the formulation of 'values-based realism' and its portrayal of the Global South require closer examination than that offered by the book itself. These restrictions are not an impediment to its contribution, but rather increases the value of the book as a discussion point on the contours of the new world order.

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