Journal of Aerospace & Security Studies
2023 | Volume II | pp. 1-19

India's Acquisition of S-400 Air Defence System and Pakistan's Response Options

Shaza Arif

Abstract

India's acquisition of the S-400 from Russia has stirred significant discussion in geostrategic circles globally. Touted as a groundbreaking defence asset, the S-400 is expected to amplify India's military stature, particularly as a deterrent against Pakistan. However, the prevailing Indian narrative, influenced by its media and policymakers, appears to overstate the system's actual impact in the South Asian context. Integrating and achieving optimal performance from the Air Defence System (ADS) presents India with tangible challenges. In response, Pakistan is poised to consider robust countermeasures. This paper delves into the implications of the S-400's deployment, outlines the anticipated operational hurdles for India, and explores Pakistan's potential counterstrategies.

Keywords: Defence Technology, Military Capabilities, Air Defence System, Defence Acquisition, Deterrence Strategy.

Introduction

The Russian S-400 Air Defence System (ADS) has elicited considerable attention. The ADS is claimed as one of the best in the world and is seen as superior to its Western counterparts, such as American Patriot Advanced Capability (PAC) and Terminal High Altitude Area Defence (THAAD) systems. It is engineered to intercept advanced aircraft, Unmanned Aerial Vehicles (UAVs), ballistic missiles, and cruise missiles.[1]Its recognition as a formidable defence asset is attributed to its sophisticated features, encompassing extended operational range, augmented manoeuvrability, increased velocity, and enhanced radar systems.[2] Additionally, the system offers a distinctive layered defence strategy, utilising four distinct missile types, each designed for specific operational ranges: 40km, 120km, 250km, and 400km, respectively.

The S-400 ADS gained relevance in South Asia following India's USD5.5 billion deal with Kremlin in 2018.[3] Driven by realist ambitions and hegemonic designs, India is bent on augmenting its military power in the region. The deal was seen with apprehension in Washington, and India was repeatedly asked to abandon it.[4]

---

1 Peter Suciu, "Why Everyone Wants to Buy Russia's S-400 Missile System," *National Interest*, December 25, 2021, https://nationalinterest.org/blog/reboot/why-everyone-wants-buy-russias-s-400-missile-system-198329.

2 "S-400 Triumph Air Defence Missile System," *Army Technology*, February 3,2020, https://www.army-technology.com/projects/s-400-triumph-air-defence-missile-system/.

3 Franz-Stephan Gady, "India, Russia Sign $5.5 Billion S-400 Deal during Modi-Putin Summit," *Diplomat*, October 5, 2018, https://thediplomat.com/2018/10/india-russia-sign-5-5-billion-s-400-deal-during-modi-putin-summit/.

4 Vikas Pandey, "S-400: India Missile Defence Purchase in US-Russia Crosshairs,"*BBC News*, October 5, 2018, https://www.bbc.com/news/world-asia-india-45757556.

However, New Delhi went ahead with the acquisition. Subsequently, in 2021, training of Indian military personnel and technicians was conducted in Russia.[5] This was shortly followed by deliveries of the systems in November 2021,[6] brushing aside US concerns and ending all ambiguities regarding their arrival.

India's purchase of the S-400 system raised questions concerning potential sanctions under the Countering American Adversaries Through Sanctions Act (CAATSA).[7] Notably, both China[8] and Türkiye[9] faced stringent sanctions subsequent to their acquisition of the same system. While the US made it clear that a blanket waiver for India was not on the table,[10] the implementation of

---

5 Snehesh Alex Philip, "Despite Covid, 100+ IAF Personnel are in Russia on S-400 Missile Training as Delivery Nears," *Print*, May 17, 2021, https://theprint.in/defence/despite-covid-100-iaf-personnel-are-in-russia-on-s-400-missile-training-as-delivery-nears/658533/.

6 Editorial, "Russia starts Missile Supplies to India despite U.S. Sanctions Risk," *Reuters*, November 14, 2021, https://www.reuters.com/world/india/russia-starts-missile-supplies-india-despite-us-sanctions-risk-2021-11-14/.

7 Manveena Suri and Steve George, "India risks US Sanctions following $5 Billion Russia Defense Deal," *CNN*, October 5, 2018, https://edition.cnn.com/2018/10/05/asia/india-s400-deal-intl/index.html.

8 Franz-Stefan Gady, "US Sanctions China over Purchase of S-400 Air Defense Systems, Su-35 Fighter Jets from Russia," *Diplomat*, September 21, 2018, https://thediplomat.com/2018/09/us-sanctions-china-over-purchase-of-s-400-air-defense-system-su-35-fighter-jets-from-russia/.

9 Jonathan Marcus, "US removes Turkey from F-35 Fighter Jet Programme," *BBC News*, July 17, 2019, https://www.bbc.com/news/world-us-canada-49023115.

10 Franz-Stefan Gady, "Senior US Official: No Blanket Waiver for India on S-400 Buy," *Diplomat*, January 10, 2020, https://thediplomat.com/2020/01/senior-us-official-no-blanket-waiver-for-india-on-s-400-buy/.

sanctions hinged on the arrival of the systems in India.[11] Ironically, these systems were delivered to India and no sanctions were levied. In fact, on the contrary, in July 2022, the US House of Representatives approved a legislative amendment granting India a waiver from punitive sanctions related to the S-400 acquisition, thereby resolving any remaining uncertainties.[12]

From a strategic standpoint, India's acquisition of the S-400 system and the subsequent diplomatic maneuvering to avoid US sanctions underscore its growing geopolitical influence and assertiveness in defence procurement. Given that China and Türkiye faced repercussions for similar acquisitions, the US decision to exempt India highlights the country's unique standing in international politics. This move will not only amplify her defensive capabilities but is also likely to shift the power dynamics in the South Asian region.

These developments significantly alter regional dynamics. Pakistan, being a primary strategic competitor of India in the region, will inevitably feel pressured to recalibrate its defence and foreign policies in light of this new acquisition to devise response strategies to mitigate the enhanced threat profile and restore balance in regional strategic stability. Consequently, prompt and innovative measures become imperative for other regional actors as well to ensure that the balance of power and strategic deterrence remain intact amidst evolving defence postures.

---

[11] Snehesh Alex Philip, "US raises Russian S-400 Issue, India says it has Diversified Portfolio," *Print,* March 20, 2021, https://theprint.in/diplomacy/us-raises-russian-s-400-issue-india-says-it-has-diversified-portfolio/625459/.

[12] "US House Approves CAATSA Waiver for India's Purchase of Russian S-400 Missile Defence System," *Wire,* July 15, 2022, https://thewire.in/external-affairs/us-house-approves-caatsa-waiver-for-indias-purchase-of-russian-s-400-missile-defence-system.

The paper will briefly discuss India's potential deployment options for the S-400 ADS. It will focus on various challenges related to its effectiveness and integration. The analysis will culminate by exploring options available to Pakistan. A realist framework informs this study. The research methodology incorporated both primary and secondary sources. Open-ended interviews were conducted, and data was also sourced from journal articles, reports, newspaper articles, and online platforms. A notable limitation of this research is scarce academic content on the subject, especially in books and journals. Additionally, given the sensitive nature of their high-security roles, it was imperative to maintain the anonymity of several interviewees in the study.

Indian Deployment Options

Since the 2018 agreement with Russia, the S-400 system has garnered significant attention in the Indian media. As the country has now received the system, an examination of its deployment becomes imperative. The precise positioning of the newly procured ADS remains to be seen. As stipulated by the agreement with the Kremlin, India will acquire five S-400 systems.[13] The designated deployment locations for these systems have not been publicly disclosed; however, specific indicators may provide insights into potential deployment strategies.

Threat perception will be an important factor that will guide the deployment of the systems. The South Asian geostrategic environment is increasingly conflict-prone, where India-China and India-Pakistan rivalries shape regional dynamics. Apart from Pakistan and China, India does not regard any of its other neighbours as a major threat. Hence, in such an environment, it is

[13] Mark Episkopos, "Russia's Sale of the S-400 to India: Part of a Bigger Defense Partnership," *National Interest*, November 11, 2018, https://nationalinterest.org/blog/buzz/russias-sale-s-400-india-part-bigger-defense-partnership-35732.

likely that all five systems will be deployed against Pakistan and China. Furthermore, while India may project the notion that its strategic capabilities are driven by a two-front approach, historical analysis suggests that Pakistan has consistently been the more dominant concern in Indian strategic calculations. Consequently, one could anticipate a deployment configuration that is skewed towards Pakistan — perhaps three systems oriented towards Pakistan and two towards China. Regardless of the specific deployment plans concerning China, it is evident that the primary emphasis of these deployments is directed at Pakistan.

As reported by *India Today*, one system is already deployed against Pakistan in the Punjab sector on the western front.[14] Another system is likely to be deployed in the southern region bordering Pakistan ensuring coverage of that sector. The third system is projected to be positioned equidistantly between the first two, bridging any gaps and maximising the coverage area. Regarding China, it can be inferred that out of the two systems; one may be deployed in the Arunachal Pradesh region bordering the latter.[15]The strategic significance of Arunachal Pradesh, given the territorial disputes between India and China, further underscores the rationale for the system's deployment there. The second system is likely to be located on the north-western frontier, proximate to the Ladakh region. Notably, due to the region's geographic contiguity, a deployment near the north-western border might also serve, to some extent, as a countermeasure against Pakistan.

---

[14] Manjeet Negi, "India deploys First S-400 Air Defence System in Punjab Sector," *India Today*, December 21, 2021, https://www.indiatoday.in/india/story/india-russia-s-400-air-defence-missile-system-punjab-sector-1890141-2021-12-21.

[15] Jeff Smith, "China-India Border Crisis," *Journal of Indo-Pacific Affairs* 3, no. 4 (2021): 29-33, https://www.airuniversity.af.edu/Portals/10/JIPA/IndoPacificPerspectives/June%202021/07%20Smith.pdf.

Effectiveness of the S-400 against Various Targets

After inferring its probable deployment, it is pertinent to discuss effectiveness of the system and its possible challenges. Effectiveness depends on a number of factors. One, how far the systems are deployed from the Indian border. The system is of great strategic importance, and this outweighs its operational relevance. India will certainly place the system at a distance where it is well-protected. Nonetheless, the proximity to the border at which the S-400 system is deployed hinges significantly on the specific missile variant in use. The S-400 ADS incorporates four distinct missile types, each with its respective range: the 9M96E (40km), 9M96E2 (120km), 48N6 (250km), and the 40N6E (400km). Together, these missiles provide a stratified defensive shield.[16] Within the Indian strategic discourse, considerable emphasis has been placed on the 400km range offered by the ADS, particularly the 40N6E missile. It remains to be seen whether India receives the 40N6E missile or not.

Should the S-400 ADS incorporate the 40N6E missile variant with its 400km range, it would permit the deployment of all five systems further within Indian territory. Conversely, if the 48N6 missile variant with a 250km range is procured, the strategic dynamics will shift markedly. Strategically, positioning the ADS in close proximity to the border may not align with India's interests. Such a deployment might expose the system to potential engagement by Pakistani aircraft and Unmanned Aerial Vehicles (UAVs), rendering it susceptible to direct neutralisation efforts. Moreover, the S-400 uses single engagement radar to illuminate the targets for each

[16] Stephen Bryen, "Why Russia's S-400 Anti-Air System is Deadlier Than You Think," *National Interest*, November 9, 2019, https://nationalinterest.org/blog/buzz/why-russias-s-400-anti-air-system-deadlier-you-think-94541.

battery deployed.[17] This radar, detectable during its transmission phase, is susceptible to long-range precision strikes using anti-radiation missiles or TV/LASER guided weapons. Without this crucial radar component, the functionality of the entire battery would be compromised.[18] Conversely, deployment deep within Indian territory could compromise the system's operational efficacy. These opposing considerations present a complex dilemma for Indian strategists, with implications for the systems' overall effectiveness.

Secondly, it is essential to distinguish between the advertised maximum ranges of the ADS missiles and their effective operational ranges. The nominal, or advertised, ranges may not consistently align with real-world engagement distances. Various factors, such as the Earth's curvature, reliance on ground-based radar systems, and the topographical features of the deployment area, can influence the actual effective ranges of the ADS missiles in potential scenarios.[19] The challenges of engaging a moving target are often underestimated. Effective range of S-400 missiles against manoeuvrable targets at low altitudes may be as low as 20 to 35 km.[20] In a hypothetical situation where India seeks to operationalise the 400km range capability, an aircraft would need to maintain an altitude of 70,000 feet to be detected and

---

17 Robert Dalsjö, Christofer Berglund and Michael Jonsson, *Bursting the Bubble Russian A2/AD in the Baltic Sea Region: Capabilities, Countermeasures, and Implications*, report (Stockholm: FOI-Swedish Defence Research Agency, 2019), 53, https://www.foi.se/rest-api/report/FOI-R--4651--SE.

18 Ibid.

19 Usman Ansari, "Can Pakistan Counter India's New S-400 Air Defense System?" *Defence News*, January 17, 2022, https://www.defensenews.com/global/asia-pacific/2022/01/16/can-pakistan-counter-indias-new-s-400-air-defense-system/.

20 Michael Jonsson and Robert Dalsjö, *Beyond Bursting Bubbles*, report (Stockholm: FOI-Swedish Defence Research Agency 2020), 97, https://www.foi.se/rest-api/report/FOI-R--4991--SE.

intercepted by the system.[21] For aircraft operating at lower altitudes, detection ranges diminish substantially, potentially to as little as 60-70km.Consequently, an aircraft might penetrate deep into Indian airspace before detection. Such a limitation could significantly constrain the operational utility of the S-400 system.

Of paramount importance in the discourse on missile technology is the operational limitation of the ADS in the South Asian context.[22] Given the close geographical proximity between India and Pakistan, missile delivery times are markedly reduced, often amounting to mere seconds. This abbreviated delivery interval consequently diminishes the response window, thereby impeding the optimal performance of the ADS. Nonetheless, the S-400 system stands out as a significant countermeasure against aircraft operating at higher altitudes. Conversely, its efficacy diminishes substantially when confronted with low-altitude aircraft or missile threats, given its relatively constrained range in such scenarios.

Lastly, despite judicious strategic placement of the S-400 systems, inherent coverage gaps are likely to persist, particularly given the extensive span of the border. Regions outside the purview of the ADS will remain susceptible to potential assaults. Moreover, even with the deployment of all five units, vast tracts of India's southern and central territories would continue to be exposed, thus undermining the comprehensive defensive efficacy of the ADS. Consequently, any assessment of the ADS' effectiveness ought to be approached with caution, considering the myriad of influencing variables.

---

21 Asim Sulaiman, interview by Arshad Sharif, *Power Play,* February 16, 2021, https://www.youtube.com/watch?v=CKIZOaWwreI&t=1671s.

22 Adil Sultan, interview by Faisal Rahman, *Views on News*, December 22, 2021, https://www.youtube.com/watch?v=aRRJYxmsNLU.

Challenges vis-à-vis Employment

Indian thinking on how it wishes to employ the system is also critical to evaluate its impact. The employment of the ADS can be offensive, defensive or a combination of both. As previously mentioned in the paper, the ADS appears to be a powerful asset and deserves due consideration. It is undoubtedly a force multiplier that will add strength to any military possessing it. However, its impact is highly exaggerated by the Indian side. Whether it is employed for offensive or defensive purposes, several challenges will be encountered vis-à-vis S-400 by the military leadership in terms of its integration and operationalisation.

The utility and function of the S-400 system ought to be understood within the broader context of an expansive defence network. Its efficacy is maximised when it operates as a component within a larger Integrated Air Defence System (IADS). Optimal performance of the ADS is intrinsically linked to its centrality in such an overarching network, necessitating a robust centralised command and control structure. Drawing from a definition provided by a USAF intelligence expert, an IADS can be characterised as the 'structure, equipment, personnel, procedures, and weapons used to counter an adversary's airborne penetration of one's own claimed territory.'[23] This intricate system seeks to synchronise disparate elements of air defence mechanisms, facilitating concurrent air surveillance, battle management, and weapons control.

Regarding the S-400, its strategic utility is predicated upon its seamless integration with other defence assets present within India, thereby amplifying the overall strength of the air defence and

[23] Peter W. Mattes, "What is a Modern Integrated Air Defense System," *Air Force Magazine,* October 1, 2019, https://www.airforcemag.com/article/what-is-a-modern-integrated-air-defense-system/#:~:text=An%20IADS%20is%20the%20%E2%80%9Cstructure,one%20Air%20Force%20intelligence%20expert.

concurrently addressing potential vulnerabilities. While India's aspirations for the S-400 hinge upon its successful incorporation into an IADS, the realisation of this objective, although feasible, represents a multifaceted and exacting challenge.

The IADS must be tailored to meet the operational demands and augment the efficacy of the tri-service components of the Indian armed forces. These three distinct services possess divergent perspectives, doctrines, and conceptualisations of warfare. Accordingly, each service employs its unique command and control apparatus, reflecting its specific operational and strategic nuances.[24] Notwithstanding the joint exercises undertaken by the tri-service components, there appears to be a marked deficit in emphasis on achieving uniformity across various domains, namely networks, operations, communication, logistics, maintenance, transport, and training.[25] Furthermore, the integration of radars, sensors, and electronic communication systems, especially in the context of the S-400, presents intricate challenges.[26] Differing beliefs and convictions pertaining to these systems can further complicate matters, potentially hindering the seamless integration of the system.

India's air defence matrix is also characterised by a multiplicity of weapon systems, underscoring its diverse origins. Beyond indigenous capabilities, the Indian inventory encompasses armaments from the United States (US), Israel, France, Europe, and Russia. The task of integrating such a heterogeneous array of systems is inherently complex, necessitating significant time, expertise, and meticulous processes. The fusion of foreign

---

[24] Ashwani Kumar Sachdev, "Challenges of Integrated Air Defence," *Indian Defence Review* 36, no 2, (2021), http://www.indiandefencereview.com/news/challenges-of-integrated-air-defence/.

[25] Ibid.

[26] Ibid.

weaponry is further contingent upon the acquiescence of the respective donor nations. For instance, the US is likely to harbour reservations regarding the amalgamation of its armaments with the Russian ADS. As a result, India faces an extended timeline in surmounting these integration challenges, which, in turn, could influence the operational effectiveness of the S-400 ADS.

In a potential aerial confrontation, the battlefield becomes intricately multifaceted.[27] Dense air activity typifies such scenarios, with both allied and adversarial aircraft operating in close quarters. The airspace becomes a complex matrix, influenced not only by vertical and horizontal dimensions but also by the dynamic interplay of time and space. This intricate environment encompasses fast jets, slower helicopters, missiles, and ground-based air defence systems like the S-400. The imperative for timely information sharing across these systems cannot be overstated, as lapses in this regard can exacerbate the risk of fratricide. One pertinent case study is the unfortunate event of 27 February 2019 when an IAF missile inadvertently targeted its own Budgam Mi-17 helicopter.[28] The mishap, which resulted in the tragic loss of six Indian personnel, was attributed to an electronic recognition failure.

Within such complex operational contexts, especially when systems from different services are in close coordination, the fog of war can significantly amplify the potential for fratricide. The introduction of the S-400, with its expansive range and high-altitude capabilities, might further complicate this matrix. The likelihood of

---

[27] "Challenges of Integrated Air Defence," *Air Power Asia*, April 4, 2020, https://airpowerasia.com/2020/04/24/challenges-of-integrated-air-defence/.

[28] Abhishek Bhalla, "Budgam Mi-17 Crash: IAF Chief admits Big Mistake, says our Own Missile Hit Chopper," *India Today*, October 4, 2019, https://www.indiatoday.in/india/story/budgam-mi-17-crash-iaf-chief-admits-big-mistake-1606217-2019-10-04.

such inadvertent engagements increases, especially if systems are deployed offensively, given the intricate dynamics of the battlefield.

Similarly, there are tangible risks associated with inadvertently targeting commercial airlines operating in proximate airspaces. A salient example of such a tragedy occurred in 2020 when Iran unintentionally downed a commercial aircraft belonging to Ukraine International Airlines, mistakenly identifying it as a hostile entity.

The discourse on operational failures gains further relevance in light of a revelation by the Indian Defence Ministry on 11 March 2022. They confirmed that an Indian missile was unintentionally launched into Pakistani territory due to a technical malfunction on 9 March 2022.[29] Such an incident, prima facie, underscores potential shortcomings in the operational rigor of the Indian Armed Forces. Moreover, it inevitably precipitates concerns surrounding the integration and management of more intricate weapon systems like the S-400

India's acquisition of the S-400 has been met with significant optimism, often lauded as a strategic coup with transformative implications. It is being championed as an instrumental force-multiplier, purportedly bolstering India's air defence capabilities and rendering its territory less susceptible to external aerial threats. Furthermore, the Indian government had made claims to suggest that this acquisition might grant India leverage over Pakistani airspace. However, the practical implications of deploying the system do not align perfectly with such optimistic projections. As elucidated in the preceding discussions, the deployment and operationalisation of the ADS involve intricate complexities and necessitate judicious decision-making.

[29] Ministry of Defence, "Statement of Accidental Firing of a Missile," press release, Government of India, March 11, 2022, https://pib.gov.in/PressReleasePage.aspx?PRID=1805148.

Options for Pakistan

Given its geographical proximity and long-standing geopolitical dynamics with India, Pakistan finds itself compelled to formulate countermeasures against this emergent technology, even if the ADS might be perceived as somewhat inflated in its strategic significance. Historically, in the Indo-Pak paradigm, Pakistan has consistently responded with calibrated measures to address any perceived shifts in strategic balance. The country has assiduously ensured that no unilateral action by India disturbs the regional equilibrium to its detriment. This strategic doctrine is likely to persist in the face of new challenges.

For Pakistan, the focal point of concern is not solely India's procurement of the air defence system. Rather, it is the potential for this acquisition to instil an undue sense of security among Indian policymakers. Over the past three years, following a pronounced setback against the Pakistan Air Force (PAF) on 27 February 2019,[30] India has refrained from embarking on military ventures in the region. Yet, the sustainability of this restraint remains ambiguous. Given India's historical predilection for strategic miscalculations, an augmented military capability in the forthcoming years might embolden its leadership to revert to assertive actions. In response, Pakistan must evaluate a spectrum of strategic options to recalibrate the evolving balance of power.

Pakistan has the capacity to employ both non-kinetic and kinetic strategies against the system. Electronic Countermeasures (ECMs) stand out as particularly viable tools to mitigate threats posed by the ADS. These ECMs can deploy both active and passive techniques to jam or disrupt the system's radars. This prowess was evinced by the PAF on 27 February 2019, where it adeptly utilised electronic countermeasures against Wing Commander Abhinandan

[30] Shaza Arif, "Revisiting February 27, 2019: PAF's Befitting Reply to Indian Aggression," *Regional Times*, February 24, 2020.

Varthaman's aircraft.[31] It is, however, noteworthy that the ADS may be fortified with Electronic Counter-Countermeasure (ECCM) capabilities. Yet, in the ever-evolving technological landscape, each advancement is invariably met with an equivalent or superior countermeasure. Given this dynamic, it would be prudent for the PAF to intensify its investments in cultivating more sophisticated ECMs to pre-emptively address such threats.

From a kinetic standpoint, it would be prudent for Pakistan to leverage cutting-edge technologies and innovative techniques. These might encompass saturation strategies, Unmanned Aerial Vehicles (UAVs), Multiple Integrated Reentry Targetable Vehicles (MIRVs), and hypersonic systems. Saturation, which involves inundating an ADS with more targets than it can successfully intercept, emerges as a potent counterstrategy against systems like the S-400. When faced with an overwhelming number of targets, the efficacy of any ADS is inherently compromised. Pakistan already possesses a strong arsenal of ballistic and cruise missiles which can take part in the strike package for saturation along with decoys. It should leverage its industrial capability of cruise and ballistic missile production against this threat. In 2017, Russia did not use its S-400 present in Syria to protect Shayrat air base against the American Tomahawk cruise missile strikes.[32] It is likely that the S-400 was intentionally not used given that its inability to take down some of the cruise missiles would have raised questions about its efficiency.

---

31 Editorial, "Abhinandan's Jet downed because Pakistan had Jammed Communication: Indian Media," *Pakistan Today*, August 19, 2021, https://archive.pakistantoday.com.pk/2019/08/14/abhinandans-jet-downed-because-pakistan-had-jammed-communication-indian-media/.

32 Justin Bronk, "Russia's Air Defence Challenge in Syria," *Royal United Services Institute*, June 29, 2017, https://www.rusi.org/explore-our-research/publications/rusi-defence-systems/russias-air-defence-challenge-syria.

UAVs also stand out as a compelling kinetic counterstrategy. The advent of UAVs has ushered in transformative paradigms in modern warfare. While initially anchored in traditional Intelligence, Surveillance, and Reconnaissance (ISR) roles, their operational scopes have expanded considerably, encompassing a diverse array of tactical and strategic functions. Notably, their efficacy against ADS has been empirically validated in recent conflicts. In theatres such as Armenia, Libya, and Syria, UAVs demonstrated their capability to neutralise the Russian ADS effectively.[33] Turkish Bayraktar TB2 drones in particular have emerged as pivotal assets in the modern theatre of conflict. In several confrontations, most notably those aforementioned,[34] these drones have fundamentally altered the tactical landscape by effectively neutralising enemy ADS in economically efficient manners. Given this backdrop, it is imperative for Pakistan to amplify its investments in UAV technology. This can be achieved by bolstering indigenous programmes and forging strategic collaborations with allies such as China and Türkiye. Beyond their direct kinetic capabilities, UAVs offer a dual utility; they can be employed as platforms to deploy Electronic Countermeasures, thereby evading detection. Furthermore, their potential to play a central role - especially causing saturation through drone swarming techniques - accentuates their strategic significance.

---

[33] Shaza Arif, "India's Acquisition of the S-400 Air Defense System: Implications and Options for Pakistan," *Journal of Indo-Pacific Affairs* 4, no.5 (2021): 40-54, https://www.airuniversity.af.edu/JIPA/Display/Article/2743750/indias-acquisition-of-the-s-400-air-defense-system-implications-and-options-for/.

[34] Shaan Sheikh and Wes Rumbaugh, "The Air and Missile War in Nagorno-Karabakh: Lessons for the Future of Strike and Defense," *Centre for Strategic and International Studies*, December 8, 2020, https://www.csis.org/analysis/air-and-missile-war-nagorno-karabakh-lessons-future-strike-and-defense.

The Multiple Integrated Reentry Vehicle (MIRV) technology may also be a potent counter to systems like the S-400. With the successful test of the Ababeel missile in 2017, Pakistan affirmed its capability in this domain.[35] While the S-400 boasts a high kill-ratio, this advantage can be potentially neutralised by inundating the system with numerous warheads. The inherent design of MIRVs, which features multiple warheads, can challenge the ADS' ability to effectively engage all incoming threats, thereby breaching its defences. It is crucial that Pakistan continues to reinforce this technology as a credible countermeasure against the S-400.

Additionally, hypersonic technology warrants greater research and investment. As highlighted earlier, the S-400 exhibits potential vulnerabilities, especially concerning its engagement radar. In this context, hypersonic systems can serve as pivotal tools to penetrate the protective envelope of the Indian ADS.

Historical analysis underscores that the PAF has traditionally operated with fewer numbers relative to the Indian Air Force (IAF). Yet, this numerical disparity has not impeded the PAF's exemplary performance in past engagements. In aerial conflicts, sheer numerical strength does not invariably translate to victory. Rather, the determinative factors lie in the strategic planning, the finesse of skills demonstrated, the quality of training imparted, and the tactics deployed. In this vein, it is essential for the PAF to conceptualise and implement innovative training programmes to further enhance its operational effectiveness.

Hence, contrary to prevailing Indian assertions, the ADS is not impervious to counteractions. In addressing this threat, Pakistan

[35] Debalina Ghoshal, "Pakistan's MIRV Test: Positive Development for Strategic Stability?" *South Asian Voices*, May 8, 2017, https://southasianvoices.org/pakistan-mirvs-positive-development-strategic-stability/.

ought to employ a judicious blend of emergent technologies and innovative strategies.

Conclusion

The emergence of the S-400 ADS within South Asia signals a potential paradigm shift in the security landscape. Heralded by India as a revolutionary addition to its arsenal, there is no denying the significant expectations surrounding its deployment, particularly in the context of its strategic position against Pakistan. Notably, while its deployment design by India strongly indicates a Pakistan-centric bias, the real crux of the matter is not just operational. The system, for all its purported capabilities, also casts a profound psychological shadow. However, the system's true efficacy will be measured not just by its hardware, but by intricate factors like missile choices, vulnerabilities inherent in its engagement radar, effective operational ranges, and the broader backdrop of missile technology dynamics in South Asia.

The acquisition of the S-400 system by India is emblematic of its aspirations to bolster its air defence capabilities and project greater strategic dominance in the region. However, as with any advanced system, its integration and operation come with a spectrum of challenges. Beyond the technical intricacies of melding the S-400 into an already diverse array of weaponry, India faces the equally daunting task of ensuring seamless interoperability among services with disparate doctrines and command structures. The past incidents, including unintended missile launches and unfortunate fratricides, underscore the magnitude of the challenges ahead, with potential pitfalls not just in equipment integration but also in operational doctrine and training.

Moreover, the political ramifications of integrating Russian systems with weaponry from Western nations, notably the US, add another layer of complexity to the S-400's deployment. The system's portrayal by certain Indian quarters as an unparalleled

game-changer may well risk engendering a false sense of invincibility, potentially leading to strategic miscalculations. Ultimately, while the S-400 is undeniably a formidable addition to India's defence portfolio, its efficacy will be determined as much by the strategic, technical, and diplomatic challenges it presents as by its inherent capabilities. In navigating these challenges, India will require a nuanced, multidimensional approach rather than resorting to false bravado and rhetoric, ensuring that the system's potential and its pitfalls are recognised in equal measure.

India's acquisition of the S-400 system undeniably shifts the strategic dynamics in the South Asian airspace. Yet, as history has shown, strategic imbalances are rarely, if ever, permanent. Pakistan's defence landscape is replete with examples of successful adaptations in the face of evolving challenges. In response to the S-400 deployment, a multidimensional approach that encompasses both non-kinetic and kinetic measures emerges as the most pragmatic course. By leveraging emerging technologies - ranging from advanced electronic countermeasures to hypersonic systems - and reinforcing innovative training paradigms within the PAF, Pakistan can not only counteract the perceived advantages of the S-400 but also reaffirm its commitment to maintaining regional equilibrium. Collaboration with friendly states, investment in indigenous capabilities, and an unwavering focus on strategic preparedness will remain essential as Pakistan navigates this latest defence challenge. The dynamics of the Indo-Pak rivalry once again underscore the age-old adage: It is not the weapon but the strategy and intent behind its use that ultimately determines its efficacy.

Shaza Arif has studied Defence and Diplomatic Studies from the Fatima Jinnah Women University, Pakistan. Her areas of interest are Space, Artificial Intelligence, Military Modernisation and Strategy. She has been extensively published in international and national newspapers on issues related to politics and modern warfare.