India-Pakistan Development of Drones: Implications for Strategic Stability

Nimra Javed[*] and Zohaib Altaf[**]

Abstract

This paper examines the implications of drone technology advancements by India and Pakistan on strategic stability in South Asia. It addresses a critical research gap by analysing how these developments impact deterrence, crisis stability, and arms race dynamics in the region. The study questions whether the rapid growth of drone capabilities disrupts established deterrence frameworks, heightens crisis instability and accelerates arms race. Using a qualitative approach, the paper draws on primary and secondary sources, including military reports and academic research. The findings indicate that India's pursuit of swarm and autonomous drones poses a direct threat to deterrence stability by introducing counterforce capabilities targeting Pakistan's second-strike assets. In contrast, Pakistan's drone use is focused on reinforcing its deterrent posture and improving crisis management through enhanced Intelligence, Surveillance, and Reconnaissance (ISR) operations. However, India's technological edge increases the risk of escalation which may likely destabilise the regional security environment. The ongoing technological buildup in both countries also triggers an action-reaction cycle which may likely undermine arms race stability in South Asia. This study emphasises the urgency of addressing India's destabilising drone developments to maintain strategic balance and prevent escalation.

Keywords: South Asia, Strategic Stability, India-Pakistan Rivalry, Drone Technology, Deterrence Stability, Crisis Management.

[*] *The author is Research Officer at the Center for International Strategic Studies AJK. Email: Nimrahjaved42@gmail.com.*

[**] *The author is Associate Director at the Center for International Strategic Studies AJK. Email: Altafzohaib12@gmail.com.*

Introduction

The rapid proliferation of drone technology is significantly altering the strategic landscape of South Asia, particularly in the context of enduring rivalry between nuclear-armed states — India and Pakistan. Both countries have integrated drones into their military doctrines driven by the evolving security environment along their borders. India's focus on advancing its swarm, autonomous drone and Kamikaze drone capabilities[1] contrasts with Pakistan's approach which emphasises strengthening its deterrent posture.[2] These developments introduce complex dynamics that could impact strategic stability in the region, raising questions about deterrence, crisis management and the potential for an arms race.

The problem addressed in this paper is the potential of drone technology to disrupt established deterrence stability, crisis instability, and fuel an arms race in South Asia. While India's technological advancements in drones have the potential to challenge Pakistan's nuclear deterrence. Pakistan's drone deployment aims to reinforce its defensive posture and maintain a credible retaliatory capacity.

Existing literature provides context but leaves some gaps in understanding the strategic implications of drone advancements in South Asia. Childs notes that the proliferation of drones in smaller nuclear powers, like India and Pakistan, can impact preemptive strike decisions by enhancing counterforce targeting capabilities, thus affecting deterrence dynamics.[3] Breanne Schneider touches on India's use of drones for counterterrorism and strategic balance but does not explore their impact on nuclear deterrence.[4] Sultan highlights that the nuclear competition between India and Pakistan, including the adoption of drone technology, impacts their doctrines and

1 Breanne Schneider, "India's Drones: Assessing the Rationale for Unmanned Aerial Vehicle Acquisition," *Cornell Internation Affairs Review* 12 (November 1, 2018), https://doi.org/10.37513/ciar.v12i1.509

2 Mahmood Ahmad, "The Use of Drones in Pakistan: An Inquiry into the Ethical and Legal Issues," *The Political Quarterly* 85 (2014): 65-74, https://doi.org/10.1111/J.1467-923X.2014.12068.X

3 Steven J. Childs, "Developing Nations, Drones and Deterrence: Unmanned Aerial Vehicles and Small Nuclear Powers," *Comparative Strategy*, January 2, 2021, https://www.tandfonline.com/doi/abs/10.1080/01495933.2021.1853431.

4 Schneider, "India's Drones."

postures, potentially undermining regional stability. [5] India's rapidly developing space-based Intelligence, Surveillance, and Reconnaissance (ISR) capabilities, which include drones, have raised concerns in Pakistan about its nuclear deterrence. This build-up, alongside other technologies like supersonic cruise missiles and ballistic missile defence, indicates India's growing first-strike potential. These developments could increase the likelihood of nuclear escalation in South Asia.[6]

This paper aims to fill this research gap by exploring how drone programmes of India and Pakistan, especially the development of swarm and Kamikaze drones affect strategic stability which has not been fully examined in existing scholarship. Furthermore, this paper also explores how drone use for India and Pakistan is different. Moreover, how private sector asymmetry can impact the drone dynamics between India and Pakistan.

This paper argues that the advancements in drone technology by India and Pakistan have significant implications for strategic stability in South Asia. India's development of swarm and autonomous drones threatens deterrence stability by targeting Pakistan's second-strike capabilities and introducing counterforce options. Conversely, Pakistan's drone use aims to reinforce its deterrent posture, ensuring a credible retaliatory capacity. Regarding crisis stability, India's technological edge and potential counterforce strategies increase the risk of misinterpretation and escalation, whereas Pakistan's emphasis on ISR roles seeks to enhance crisis management. Furthermore, the ongoing technological buildup and action-reaction cycle between the two states undermine arms race stability as both are driven to enhance their drone capabilities to maintain strategic balance.

This paper employs a strategic stability framework, consisting of three components: i. deterrence stability, ii. crisis stability, and iii. arms race stability. This framework will guide the analysis of how drone developments intersect with these aspects in South Asia. This study uses a qualitative approach, analysing secondary data sources including

---

[5] A. Sultan, "Challenges in Nuclear Posture and Deterrence from Pakistan's Perspective," *National Security Journa*.

[6] Akash Shah, "Deterrence under Surveillance: Indian Space-Based ISR Capabilities and Pakistan's Nuclear Deterrence," *Journal of Security & Strategic Analyses* 8, no. 2 (2022): 07-26, https://doi.org/10.57169/jssa.008.02.0201

military reports, academic research and strategic analyses to assess the impact of drone technology on strategic stability.

The paper is divided into two sections. The first section examines the drone developments in India and Pakistan, focusing on their technological progress and strategic objectives. The second section analyses the implications of these developments for strategic stability, addressing their effects on deterrence, crisis and arms race stability. The conclusion offers recommendations for mitigating the risks posed by emerging UAV technologies in the region.

Conceptual Framework

Strategic stability is a fundamental concept in international relations and defence policy, particularly in the realm of nuclear deterrence. At its core, strategic stability aims to prevent large-scale wars and manage the risks associated with the development and deployment of strategic weapons.[7] It is broadly divided into three main components: a. deterrence stability, b. crisis stability, and c. arms race stability.[8] Deterrence stability is founded on the principle that adversaries are deterred from initiating a nuclear attack due to a credible threat of devastating retaliatory strikes. This stability is underpinned by the survivability of a state's nuclear arsenal, ensuring a credible second-strike capability.[9] The principle of Mutually Assured Destruction (MAD) is crucial here, as it underscores the catastrophic consequences of a nuclear exchange, maintaining peace through the fear of mutual annihilation.[10] Crisis stability concerns a state's ability to avoid actions during a conflict that might escalate to a nuclear exchange.[11] It

[7] Ulrich Kühn, "Strategic Stability in the 21st Century: An Introduction," *Journal for Peace and Nuclear Disarmament* 6, no. 1 (January 2, 2023): 1-8, https://doi.org/10.1080/25751654.2023.2223804.

[8] James Johnson, *AI and the Bomb: Nuclear Strategy and Risk in the Digital Age* (Oxford University Press, 2023).

[9] Devin T. Hagerty, *Nuclear Weapons and Deterrence Stability in South Asia* (Springer, 2019).

[10] David S. McDonough, "Nuclear Superiority or Mutually Assured Deterrence: The Development of the US Nuclear Deterrent," *International Journal* 60, no. 3 (2005): 811-23, https://www.jstor.org/stable/40204064

[11] President Jimmy Carter, "Nuclear War and Crisis Stability," in *Insurgent Intellectual: Essays in Honour of Professor Desmond Ball*, ed. Brendan Taylor,

becomes fragile when one or both adversaries believe that striking first gives a significant advantage, particularly if technological advancements suggest the possibility of a successful counterforce strike.[12] Arms race stability is about the restraint from continuous strategic weapons buildup.[13] It falters when technological developments — precision missiles and advanced drones drive adversaries to continuously improve their military capabilities in response to each other potentially upsetting the strategic balance.[14]

India's integration of swarm and autonomous drones with precision-guided missiles like the Agni-P poses a challenge to Pakistan's second-strike capability, potentially undermining deterrence stability by giving India a counterforce advantage.[15]

This threat compels Pakistan to bolster its deterrence posture through its own drone deployments, reinforcing its focus on a credible second-strike response. In terms of crisis stability, India's swarm drone capabilities blur the line between conventional and strategic operations, increasing the risk of misinterpretation during heightened tensions.[16] The presence of these drones could prompt a "use it or lose it" scenario, where Pakistan might feel pressured to employ its nuclear assets preemptively to safeguard its strategic forces.[17]

Nicholas Farrelly, and Sheryn Lee, Books and Monographs (ISEAS–Yusof Ishak Institute, 2012), 17-18, https://www.cambridge.org/core/books/insurgent-intellectual/nuclear-war-and-crisis-stability/8A8F34C2B6E67930B85A799A5C0D3EBD

12 Robert Powell, ed., "Crisis Stability in the Nuclear Age," in *Nuclear Deterrence Theory: The Search for Credibility* (Cambridge: Cambridge University Press, 1990), 110-30, https://doi.org/10.1017/CBO9780511551598.006

13 Michael D. Intriligator and Dagobert L. Brito, "Arms Races and Instability," *The Journal of Strategic Studies*, December 1, 1986, https://doi.org/10.1080/01402398608437282.

14 Intriligator and Brito, "Arms Races and Instability,"

15 Zohaib Altaf and Nimrah Javed, "The Militarisation of AI in South Asia," South Asian Voices, January 17, 2024, https://southasianvoices.org/sec-c-pk-r-militarization-of-ai-01-16-2024/.

16 Capsnetdroff, "Swarm Drones in India: A Growing Capability," *CAPS India* (blog), May 27, 2024.

17 Zohaib Altaf and Nimrah Javed, "The Triad of Technology and Its Implications for Strategic Stability in South Asia," South Asian Voices, May 2, 2024, https://southasianvoices.org/sec-c-pk-r-triad-of-technology-05-02-2024/.

Moreover, India's technological buildup, particularly in advanced unmanned aerial vehicle (UAV)s, drives an arms race stability challenge, compelling Pakistan to respond with enhanced drone capabilities to maintain strategic balance. This action-reaction cycle further exacerbates tensions, highlighting how drone developments add complexity to South Asia's already delicate strategic environment.

Indian Drone Development

India's drone development programme represents a concerted effort to modernise its military capabilities.[18] Over the past decade, India has made significant investments in both indigenous drone production and the acquisition of foreign UAV technologies to enhance its ISR capabilities, as well as its offensive precision-strike potential.[19] By mid-2024, India had integrated between 2,000 and 2,500 drones into its military operations, with a substantial investment range of approximately US$361.45 million to US$421.69 million. [20] However, the programme has faced various technological and strategic challenges that have influenced its current trajectory and future ambitions.[21] Despite these obstacles, India's government remains focused on developing a comprehensive drone ecosystem, supported by policy incentives and a burgeoning domestic industry.[22]

India's indigenous drone development has primarily centered around the Rustom series, which forms the backbone of its UAV fleet. The "Rustom-1" is an 800 kg Short Range Remotely Piloted Aircraft System (SR-RPAS) designed for ISR missions, capable of flying for up to 10 hours and covering

[18] Rakshit Kweera, "Drones in Modern Warfare: Utilisation in India-Pakistan Cross-Border Terrorism and Security Implications," *Strategic Analysis* 47, no. 4 (July 4, 2023): 376-88, https://doi.org/10.1080/09700161.2023.2288989.
[19] Kweera, "Drones in Modern Warfare: Utilisation in India-Pakistan Cross-Border Terrorism and Security Implications," 95.
[20] H. S. Panag, "Indian Military Has Narrowed the Gap with PLA in Drone Warfare, Now It Needs a Clear Concept," The Print, June 27, 2024.
[21] "How India Is Trying to Revive Its Nosediving Ambitious Military Drone Project," India Today, February 10, 2024.
[22] Antara Vats, "Fast-Tracking the Flight of India's Drone Industry," Observer Research Foundations, orfonline.org, August 16, 2023.

a range of 200 km at an altitude of 20,000 feet.[23] It features conventional take-off and landing capabilities, alongside autonomous flight modes. Plans are in place to enhance the Rustom-1's operational capabilities through upgrades such as "Automatic Take-off and Landing (ATOL) systems, Synthetic Aperture Radar (SAR)" and expanded payload capacity.[24]

Building on this foundation, "Rustom-2" (also known as TAPAS-BH) represents an attempt to elevate India's ISR capabilities to a more advanced level. It incorporates the Airborne Integrated Payload Processing Unit (AIPPU) for secure data transmission, supporting electronic intelligence (ELINT) and communications intelligence (COMINT) missions. [25] Designed with a payload capacity of 350 kg and incorporating stealth characteristics, Rustom-2 aims to serve in both reconnaissance and combat support roles.[26]

India has developed specialised UAV platforms to enhance its operational flexibility. The Autonomous Flying Wing Technology Demonstrator (AFWTD) represents an aspect of this effort, focusing on autonomous operations and incorporating advanced flying-wing controls.[27] It is equipped with the capability for autonomous landings without the need for ground-based infrastructure indicating a focus on technological advancements in unmanned systems.[28]

Another facet of India's drone strategy involves long-range, precision-strike drones. The kamikaze drones, developed by the National Aerospace Laboratories (NAL), are designed for precision offensive operations with a

[23] DRDO, "RUSTOM-1 | Defence Research and Development Organisation," Defence Research and Development Organisation.
[24] DRDO, "RUSTOM-1 | Defence Research and Development Organisation."
[25] DRDO, "TAPAS-BH | Defence Research and Development Organisation ─ DRDO, Ministry of Defence, Government of India," Defence Research and Development Organisation, https://www.drdo.gov.in/drdo/tapas-bh.
[26] DRDO, "TAPAS-BH | Defence Research and Development Organisation ─ DRDO."
[27] "DRDO Carries out Successful Flight Trial of Autonomous Flying Wing Technology Demonstrator, an Indigenous High-Speed Flying-Wing UAV," Ministry of Defence, December 15, 2023.
[28] DRDO Carries out Successful Flight Trial of Autonomous Flying Wing Technology Demonstrator, an Indigenous High-Speed Flying-Wing UAV."

range of up to 1,000 km and the capacity to carry 30-40 kg of explosives.[29] These drones operate independently of GPS, thereby enhancing their utility in contested and GPS-denied environments. The kamikaze drones signify India's intent to build an offensive UAV capability that extends beyond traditional ISR roles.[30]

In addition to autonomous and long-range drones, India has made a significant push towards swarm technology, reflecting a tactical shift in its approach to ground target engagement and airspace contestation. The introduction of a swarm UAV system, comprising 100 drones capable of striking targets up to 50 km away, marks a key development in India's pursuit of advanced aerial tactics.[31] These swarm drones are designed to overwhelm defensive systems by targeting moving armoured columns, artillery positions and bunkers. While their range is currently limited, they provide a force-multiplying effect that could prove decisive in high-intensity conflict scenarios. [32]

India's drone development strategy is not solely reliant on indigenous projects; it also includes acquiring advanced UAVs from international partners to address critical capability gaps. The procurement of 31 MQ-9B Predator drones from the United States (U.S.), valued at US$3.9 billion, underscores India's emphasis on bolstering its high-altitude, long-endurance ISR capabilities.[33] The deal involves 15 Sea Guardian drones for the Indian Navy and eight Sky Guardians each for the Army and Air Force.[34] Similarly, the acquisition of Hermes-900 drones (also known as Drishti-10) from Israel illustrates India's continued reliance on foreign technology to complement its developmental efforts. [35] Moreover, India is acquiring the Hermes-900s

[29] "National Aerospace Lab Develops 'Kamikaze' Drone with 1,000km Range," *Times of India*, August 16, 2024.
[30] "National Aerospace Lab Develops 'Kamikaze' Drone with 1,000km Range."
[31] Capsnetdroff, "Swarm Drones in India."
[32] Snehesh Alex Philip, "Army Gets Its First Set of Offensive Swarm Drone System, IAF Next," *The Print*, February 13, 2023.
[33] DSCA, "India – MQ-9B Remotely Piloted Aircraft Defense Security Cooperation Agency," Official Website, Defense Security Cooperation Agency, February 1, 2024.
[34]DSCA, "India – MQ-9B Remotely Piloted Aircraft Defense Security Cooperation Agency."
[35] "Indian Army to Get First Hermes-900 Drone on June 18, to Boost Surveillance on Pakistan Border," *Economic Times*, May 10, 2024.

designed for Intelligence, Surveillance, Target Acquisition, and Reconnaissance (ISTAR) missions and can carry various payloads, including electro-optical/infrared sensors and synthetic-aperture radar systems.[36]

Table no.1

India's Drone Development Program

Drone Type	Development/ Acquisition	Capabilities	Notable Features
Rustom-1	Indigenous	ISR missions, 10-hour endurance, 200 km range, 20,000 feet altitude, autonomous flight modes	Conventional take-off and landing, planned upgrades with ATOL systems and SAR
Rustom-2 (TAPAS-BH)	Indigenous	Advanced ISR, ELINT and COMINT missions, 350 kg payload, stealth characteristics	Airborne Integrated Payload Processing Unit (AIPPU) for secure data transmission
Autonomous Flying Wing Technology Demonstrator (AFWTD)	Indigenous	Autonomous operations, autonomous landings without ground-based infrastructure	Advanced flying-wing controls, autonomous landing
Kamikaze Drones	Indigenous	Precision offensive operations, 1,000 km range, 30-40 kg payload, GPS-independent	Operates independently of GPS, offensive UAV capability
Swarm UAV System	Indigenous	Swarm capability, strikes targets up to 50 km, overwhelm defensive systems	Force-multiplying effect, targets armoured columns and bunkers
MQ-9B Predator Drones	Acquired from the US	High-altitude, long-endurance ISR capabilities	High-altitude, long-endurance, $3.9 billion deal for 31 units
Hermes-900 (Drishti-10)	Acquired from Israel	ISTAR missions, equipped with electro-optical/infrared sensors and synthetic-aperture radar systems	Various payloads, including electro-optical/infrared sensors and SAR systems

Source: "War Power India."

[36] "Hermes 900 MALE Tactical Unmanned Air Vehicle (UAV)," *Airforce Technology* (blog), https://www.airforce-technology.com/projects/hermes-900/.

The development of India's drone programme is not without significant challenges. Technological setbacks have been a persistent issue, with several indigenous projects like Nishant and Panchi abandoned due to operational vulnerabilities and lack of orders. [37] The delays in the development of tactical and Medium Altitude Long Endurance (MALE) UAVs, such as the Tapas, further underscore the challenges India faces in building advanced, operationally viable drones.[38]

To address these issues and position itself as a global drone manufacturing hub by 2030, India has launched several policy initiatives aimed at fostering a domestic drone ecosystem. The Production-Linked Incentive (PLI) scheme has been a central pillar of this strategy, recently increasing business incentives by 37.5 per cent to approximately US$20 million over three years. [39] This incentive aims to stimulate local manufacturing, reduce import dependency, and create employment in the drone sector. Additionally, the federal budget allocation for the FY2024-25 stands at US$6.9 million, reflecting a substantial increase from FY2023-24 US$4 million allocation. [40]

These financial measures are complemented by regulatory support, including the establishment of 109 training organisations, the issuance of over 10,000 remote pilot certificates, and the registration of nearly 23,000 unique identification numbers for drones.[41] The involvement of over 400 startups in the drone sector indicates a growing interest and potential for technological advancement. [42] According to the latest FICCI-EY report titled, "Making India the Drone Hub of the World." "India has the potential to exploit an opportunity of the drone revolution. The drone and its components industry can significantly strengthen India's manufacturing potential to US$23 billion approximately by 2030."[43]

---

[37] "How India is Trying to Revive its Nosediving Ambitious Military Drone Project."
[38] "Hermes 900 MALE Tactical Unmanned Air Vehicle (UAV)."
[39] Sunitha Raju, "Making Production-Linked Incentive Scheme Work Economic and Political Weekly," Economic & Political Weekly, August 23, 2024.
[40] Raju, "Making Production-Linked Incentive Scheme Work."
[41] Neha LM Tripathi, "Centre Increases Incentives by 37.5% to Boost Drone Manufacturing," *Hindustan Times*, July 29, 2024.
[42] Tripathi, "Centre Increases Incentives by 37.5% to Boost Drone Manufacturing."
[43] Ashish Rajvanshi, Ankit Mehta, and Neel Mehta, "Making India the Drone Hub of the World" (Dehli: FICCI, 2022).

Although these drones are for civilian purposes, the potential impact of civilian drone technology and its associated industries on future conflicts cannot be underestimated.[44] As demonstrated in the Ukraine conflict, the use of drones in both offensive and defensive roles has transformed battlefield tactics. In this regard, India's focus on swarm and autonomous drones, while currently limited by range, indicates an evolving strategy that could leverage improvements in technology to enhance their operational effectiveness.[45]

Pakistan's Drone Development

Pakistan's drone development has steadily progressed, driven primarily by its military requirements.[46] The Burraq, an unmanned combat aerial vehicle (UCAV) developed by the National Engineering and Scientific Commission (NESCOM), is one of the key milestones in Pakistan's UAV program.[47] Burraq ─ equipped with advanced imagery and motion sensors is capable of carrying the laser-guided air-to-surface missile "Barq." Designed for reconnaissance, surveillance, and precision strikes, it can target both stationary and moving objects, showcasing Pakistan's intent to build a versatile combat drone.[48] Complementing these drones, tactical UAVs are designed and produced by Global Industrial Defence Solutions (GIDS) for the Pakistan Armed Forces.[49] This drone is intended for real-time reconnaissance, target acquisition, surveillance, situational awareness, and disaster management missions.[50]

GIDS further advanced its UAV capabilities with the Shahpar II, a Medium-Altitude Long-Endurance (MALE) UCAV that significantly

---

[44] Dominika Kunertova, "Drones Have Boots: Learning from Russia's War in Ukraine," *Contemporary Security Policy* 44, no. 4 (October 2, 2023): 91-112.
[45] Kunertova, "Drones Have Boots: Learning from Russia's War in Ukraine," 102.
[46] Quwa Team, "Pakistan's UAV Development, Deployment, and Future," *Quwa* (blog), July 5, 2020.
[47] Office_zzam, "Pakistan NESCOM Displays Its Burraq UCAV Drone," December 5, 2018.
[48] "Pakistan NESCOM Displays Its Burraq UCAV Drone."
[49] "Shahpar Unmanned Aerial Vehicle (UAV)," *Airforce Technology* (blog), https://www.airforce-technology.com/projects/shahpar-unmanned-aerial-vehicle-uav/.
[50] "Shahpar Unmanned Aerial Vehicle (UAV)."

enhances Pakistan's defence potential.[51] This 8-meter-long drone, with a wingspan of 9.45 meters, can carry up to 53 kg internally and 190 kg externally.[52] It operates at a service ceiling of 23,000 feet for surveillance and 21,000 feet when armed, offering a flight endurance of 14 hours and a targeting range of up to 1,000 kilometers.[53] Equipped with the advanced EO/IR Zumr-II sensor suite, the Shahpar II provides robust reconnaissance capabilities. Future upgrades, including the integration of the Barq-2 missile and laser-guided bombs, demonstrate Pakistan's ongoing commitment to strengthening its drone technology for military use.[54]

The Pakistan Air Force (PAF) has also expanded its UAV fleet with acquisitions from Turkey and China. The Bayraktar Akıncı and TB2 UAVs provide the PAF with a complementary 'heavyweight-lightweight' combination.[55] The Akıncı, a high-altitude long-endurance (HALE) drone, can carry a 1,500 kg payload with a 24-hour endurance, while the TB2, a MALE drone, has a 150 kg payload capacity and a 27-hour endurance.[56]

During their display, the Akıncı featured the Indigenous Range Extension Kit (IREK) precision-guided bomb kit, laser-guided bombs, and 500 kg-class MK-83 general-purpose bombs, whereas the TB2 was equipped with the KEMANKEŞ miniature cruise missile which offers a range of 200 km.[57] Furthermore, Pakistan acquired the CH-4 UAV from China, enhancing its reconnaissance and strike capabilities with a payload capacity of 345 kg, 40-hour endurance, and the ability to carry various munitions, including AR-1 and AR-2 missiles, FT-7/130 glide bombs, and GB-7/50 precision-guided munitions.[58]

---

51 GIDS, "Shahpar-II Drone."
52 GIDS, "Shahpar-II Drone."
53 GIDS, "Shahpar-II Drone."
54 GIDS, "Shahpar-II Drone."
55 Azfar Bilal and Abdul Samad, "Impact of India's Drone Capabilities on Pakistan," *Journal of Security & Strategic Analyses* 10 (July 11, 2024): 22-38, https://doi.org/10.57169/jssa.0010.01.0308.
56 Bayraktar, "Bayraktar AKINCI," Official Website, Bayraktar, http://baykartech.com/en/uav/bayraktar-akinci/.
57 Quwa Team, "Pakistan Looks to Use Drones as Strike Assets," *Quwa* (blog), August 14, 2023.
58 Franz-Stefan Gady, "China, Pakistan to Co-Produce 48 Strike-Capable Wing Loong II Drones," The Diplomat, October 9, 2019, https://thediplomat.com/2018/10/china-pakistan-to-co-produce-48-strike-capable-wing-loong-ii-drones/.

Beyond these main UAVs, Pakistan operates a diverse array of other drones such as the Uqab, Satuma Jasoos, GIDS Scout, ZDK-03 (Karakoram Eagle), Ababeel, Falco (developed in collaboration with Leonardo, Italy), and Bravo+. [59] These UAVs contribute to Pakistan's overall operational flexibility, covering a range of roles from surveillance to target acquisition and disaster management. Despite these advancements, Pakistan's civilian drone industry remains weak. In 2022, the Minister for Science and Technology, Fawad Chaudhry, acknowledged Pakistan's negligible share in the global drone market which was valued at approximately US$22.4 billion in 2020.[60]

While the military has made strides in developing and acquiring drones for defence purposes, the absence of a robust civilian drone industry limits Pakistan's potential to fully leverage UAVs for economic, agricultural, and commercial applications.[61] For Pakistan to become a significant player in the global drone market, a more concerted effort is needed to build an ecosystem that supports research, development, and innovation in both military and civilian drone technologies.[62]

Furthermore, the strategic significance of commercial drones cannot be ignored. As one of the recent article published on the RUSI website stated, "in modern conflicts military operations are shaped by a state's ability to replace losses and generate new formations, not tactical and operational manoeuvres."[63] A recent article published in the *CNN* stated, "US military aid packages for Ukraine have been smaller in recent months, as the stockpiles of weapons and equipment that the Pentagon is willing to send Kyiv from its own inventory have dwindled."[64] If the military power like

[59] Syed Eesar Mehdi, "Understanding Pakistan's Unmanned Aerial Vehicle (UAV) Programme," International Center for Peace Studies, March 28, 2024.
[60] Jamal Shahid, "Import Ban Encourages Smuggling of Drones into Pakistan," *Dawn*, https://www.dawn.com/news/1617530.
[61] Uswa Khan, "Indigenisation of Drones: A Security Imperative for Pakistan," *CASS* (blog), May 6, 2024, https://casstt.com/indigenisation-of-drones-a-security-imperative-for-pakistan/
[62] Khan, "Indigenisation of Drones."
[63] Alex Vershinin, "The Attritional Art of War: Lessons from the Russian War on Ukraine," RUSI, December 23, 2024, https://rusi.orghttps://rusi.org.
[64] Natasha Bertrand Liebermann Oren, "US Military Aid Packages to Ukraine Shrink amid Concerns over Pentagon Stockpiles | CNN Politics," *CNN*, September 17, 2024, https://www.cnn.com/2024/09/17/politics/us-reducing-military-aid-packages-ukraine/index.html.

the U.S. with massive industrial power is unable to provide weapons to Ukraine and its stockpiles are decreasing, then it might become difficult for a state like Pakistan to keep up with the demand of drones without strong commercial drone industry. Therefore, strengthening commercial drone industry is necessary to avoid supply chain disruption during war.

Table no. 2

Pakistan's Drone Development Program

Drone Type	Development/Acquisition	Capabilities	Notable Features
Burraq	Indigenous (NESCOM)	Reconnaissance, surveillance, precision strikes, carries 'Barq' missile	Laser-guided air-to-surface missile 'Barq', targets both stationary and moving objects
GIDS Tactical UAVs	Indigenous (GIDS)	Real-time reconnaissance, target acquisition, surveillance, situational awareness, disaster management	Supports situational awareness and disaster management missions
Shahpar II	Indigenous (GIDS)	Medium-Altitude Long-Endurance, 14-hour endurance, 1,000 km range, 53 kg internal and 190 kg external payload	EO/IR Zumr-II sensor suite, potential integration of Barq-2 missile, laser-guided bombs
Bayraktar Akıncı	Acquired from Turkey	High-altitude, long-endurance, 1,500 kg payload, 24-hour endurance	Indigenous Range Extension Kit (IREK), precision-guided bombs, laser-guided bombs, MK-83 bombs
Bayraktar TB2	Acquired from Turkey	Medium-altitude, long-endurance, 150 kg payload, 27-hour endurance	Equipped with KEMANKEŞ miniature cruise missile, 200 km range

CH-4 UAV	Acquired from China	Reconnaissance, strike capabilities, 345 kg payload, 40-hour endurance, various munitions	Carries AR-1, AR-2 missiles, FT-7/130 glide bombs, GB-7/50 precision-guided munitions
Other UAVs (Uqab, Satuma Jasoos, GIDS Scout, etc.)	Various sources, Indigenous and International	Surveillance, target acquisition, disaster management	Diverse roles covering surveillance, reconnaissance, disaster management

Source: "War Power Pakistan."

Impact on Deterrence Stability

Deterrence stability hinges on the assured survivability of a state's nuclear arsenal, ensuring that a second-strike capability is maintained to deter adversaries from launching a first strike.[65] The introduction of drones into this dynamic can have a profound impact on deterrence stability,[66] particularly as India integrates advanced drone technology into its counterforce strategies.

Unlike India, Pakistan's drone strategy does not encompass an offensive or counterforce posture.[67] Given India's larger size and superior conventional capabilities, Pakistan focuses on maintaining a defensive stance to ensure deterrence stability.[68] Pakistan's UAV development is aimed at reinforcing its second-strike capability and deterring potential aggression. In this context, drones serve as force multipliers to

[65] Stephen J. Cimbala, "Deterrence Stability with Smaller Forces: Prospects and Problems," *Journal of Peace Research* 32, no. 1 (1995): 65-78, https://www.jstor.org/stable/425468.
[66] Antonio Missiroli, "Game of Drones? How New Technologies Affect Deterrence, Defence and Security," *NATO Review,* May 5, 2020.
[67] Syed Fazl-e-Haider, "Pakistan's Own Drones," *Foreign Affairs*, October 4, 2015, https://www.foreignaffairs.com/articles/pakistan/2015-10-04/pakistans-own-drones.
[68] Zubeda Anjum Niazi, "Prospects of Drone Warfare in South Asia," (Lahore: The Center for Security, Strategy and Policy Research, 2021).

counterbalance India's growing military advances, rather than as tools for offensive operations.[69]

India, however, is expanding its drone programme to potentially include counterforce strategies, directly impacting regional deterrence stability. One notable development is India's kamikaze drones, with a range of up to 1,000 km and the capacity to carry 30-40 kg of explosives.[70] These drones serve more than just a tactical function; they present a strategic threat by potentially targeting Pakistan's nuclear delivery systems and other critical military infrastructure.[71]

Moreover, India's swarm drone technology can be used for both offensive and defensive roles. In offensive role, these drones can be used to target nuclear delivery vehicles.[72] Although, currently, the range of Indian swarm drone is limited; however, in future, India can enhance range of these swarm drones. Furthermore, these swarm drones could overwhelm Pakistani defences, neutralise air force assets and disrupt command and control centres.[73]

In defensive role, when combined with advanced missile defence systems, the swarm drones form a multi-layered network capable of intercepting and neutralising incoming missiles.[74] These capabilities present a potential counterforce threat to Pakistan's strategic assets. Recently, Lieutenant General Adosh Kumar, Director General of Indian Artillery said, "Indian Army planning to induct long-range suicide drones."[75] He further

---

69 "Prospects of Drone Warfare in South Asia." 7.
70 "National Aerospace Lab Develops 'Kamikaze' Drone with 1,000km Range."
71 Joseph Trevithick, "Long-Range Kamikaze Drones Offer 'Cheap' Strike Opportunities For U.S., Allies: USAF General," Unofficial Website, The War Zone, July 31, 2024, https://www.twz.com/air/long-range-kamikaze-drones-offer-cheap-strike-opportunities-for-u-s-allies-usaf-general
72 "The Calm Before the Swarm: Drone Warfare at Sea in the Age of the Missile," War on the Rocks, July 31, 2024, https://warontherocks.com/2024/07/the-calm-before-the-swarm-drone-warfare-at-sea-in-the-age-of-the-missile/
73 "The Calm before the Swarm: Drone Warfare at Sea in the Age of the Missile."
74 "The Calm before the Swarm: Drone Warfare at Sea in the Age of the Missile."
75 Manjeet Negi, "Indian Army Planning to Induct Long-Range Suicide Drones, Rockets," *India Today,* September 28, 2024, https://www.indiatoday.in/india/story/indian-army-planning-to-induct-long-range-suicide-drones-long-range-rockets-2607725-2024-09-28

added, "We are looking at acquiring loitering munitions of long range for trail are under process."[76]

The capabilities of drones further become important when there is uncertainty about Indian "no-first-use policy. As scholarly work by Narang and Clary suggest, the technological advancements in the Indian missile accuracy and their statement shows that Indian leaders are tempted by counterforce choices.[77] Furthermore, recent scholarly work by Caitlin Talmadge, Lisa Michelini, and Vipin Narang also states, "adversaries perceive no-first-use pledges as credible only when the political relationship between a state and its adversary is already relatively benign, or when the state's military has no ability to engage in nuclear first use against the adversary."[78] Indian drone development enhances Indian counterforce capabilities, and relations between India-Pakistan are already hostile. Therefore, Indian drone development inflates Pakistan's threat perception and reduces the credibility of the Indian nuclear doctrine.

India's drone arsenal, such as the integration of swarm drones with missile systems and the use of kamikaze drones for strategic purposes, may tempt Indian decision-makers to contemplate pre-emptive counterforce actions, thereby undermining deterrence stability.[79]

In contrast, Pakistan's use of drones primarily aims to enforce deterrence stability. Recognising the conventional asymmetry with India, Pakistan integrates drones into its deterrence strategy to enhance its ability to penetrate India's multi-layered missile defence systems and ensure the survivability of its second-strike capabilities.[80]

---

[76] Negi, "Indian Army Planning to Induct Long-Range Suicide Drones, Rockets."
[77] Christopher Clary and Vipin Narang, "India's Counterforce Temptations: Strategic Dilemmas, Doctrine, and Capabilities," *International Security* 43, no. 3 (February 2019): 7-52, https://doi.org/10.1162/isec_a_00340.
[78] Caitlin Talmadge, Lisa Michelini, and Vipin Narang, "When Actions Speak Louder Than Words: Adversary Perceptions of Nuclear No-First-Use Pledges," *International Security* 48, no. 4 (April 1, 2024): 7–46, https://doi.org/10.1162/isec_a_00482.
[79] Clary and Narang, "India's Counterforce Temptations."
[80] James Patton Rogers, ed., *De Gruyter Handbook of Drone Warfare*, 1st ed., De Gruyter Contemporary Social Sciences Handbooks 4 (Boston: De Gruyter, 2024).

By deploying UAVs for ISR and integrating them with missile systems like the Fatah-II and Ababeel (Multiple Independent Re-entry Vehicle), Pakistan seeks to bolster its retaliatory capacity.[81] This strategy sends a clear signal to India that any aggression would face significant costs, thus maintaining the balance of power. Pakistan's use of drones, therefore, is centred on deterrence by denial, reinforcing its nuclear posture without adopting a provocative or offensive stance. By enhancing its ISR capabilities, Pakistan strengthens its ability to safeguard its strategic assets, thereby contributing to a more stable deterrence environment.[82]

Impact on Crisis Stability

Crisis stability refers to the ability of states to avoid escalating to nuclear conflict during a crisis. It becomes fragile when one side perceives that initiating an early strike provides a significant advantage. [83] India's integration of drones with its missile systems and its growing focus on swarm, long range kamikaze drones and autonomous drones pose significant challenges to crisis stability.

India's swarm drones, capable of coordinated group attacks, blur the line between conventional and strategic operations.[84] By integrating these drones with missile systems like the Rampage and Crystal Maze Two, India enhances its ability to target Pakistan's critical assets during a crisis, potentially signalling the capacity for a pre-emptive counterforce strike.[85] These developments could create a perception within Pakistan that it might be vulnerable to a rapid, disabling first strike, thereby lowering the nuclear threshold.[86] In such a scenario, Pakistan might feel pressured to employ its nuclear assets early to ensure its deterrence remains credible, leading to a

[81] De Gruyter Handbook of Drone Warfare.
[82] Mehdi, "Understanding Pakistan's Unmanned Aerial Vehicle (UAV) Programme."
[83] Powell, "Crisis Stability in the Nuclear Age."
[84] Pavel Podvig, "Blurring the Line between Nuclear and Nonnuclear Weapons: Increasing the Risk of Accidental Nuclear War?," *Bulletin of the Atomic Scientists* 72, no. 3 (May 3, 2016): 145-49, https://doi.org/10.1080/00963402.2016.1170363.
[85] Podvig, "Blurring the Line between Nuclear and Nonnuclear Weapons."
[86] Altaf and Javed, "The Triad of Technology and Its Implications for Strategic Stability in South Asia."

"use it or lose it" mentality. [87] The risk of misinterpretation and rapid escalation in a crisis is exacerbated by the dual-use nature of drones, where their deployment could be mistaken for preparation for offensive operations, further destabilising crisis stability.[88]

On the other hand, Pakistan's use of drones can contribute positively to ensuring crisis stability because high quality intelligence is considered stabilising. [89] Pakistan employs drones primarily for ISR operations, which enhances situational awareness and supports informed decision-making during crises.[90] By gathering real-time intelligence on India's military movements, Pakistan can reduce the uncertainty that often fuels escalation.[91] This enhanced surveillance capability allows Pakistan to monitor India's strategic assets, providing early warning and improving its understanding of the situation, thus reducing the need for hasty or pre-emptive decisions.[92] By focusing on reinforcing crisis stability through defensive and intelligence-gathering roles, Pakistan's drone strategy aims to deter conflict rather than provoke it.[93]

Moreover, Pakistan's drone strategy with its ability to saturate the Indian defence systems and penetrate multi-layered air defences, reinforces its deterrence.[94] This enhanced capability contributes to crisis

---

87 Altaf and Javed, "The Militarization of AI in South Asia."
88 Zohaib Altaf, "Indian Military's Embrace of AI Increases Risk of Nuclear Disaster," *South China Morning Post,* February 18, 2023, https://www.scmp.com/comment/opinion/article/3209801/why-indian-militarys-embrace-ai-risks-sparking-nuclear-disaster.
89 Aleksandar Matovski, "Strategic Intelligence and International Crisis Behavior," *Security Studies* 29, no. 5 (October 19, 2020): 964-90, https://doi.org/10.1080/09636412.2020.1859128.
90 Haroon Gul, "Drones, Pakistan and Future Wars," *CRSS* (blog), February 2, 2016, https://crss.pk/drones-pakistan-and-future-wars/.
91 Gul, "Drones, Pakistan and Future Wars."
92 C. M. Carter et al., "Chapter 10: UAS Intelligence, Surveillance and Reconnaissance (ISR)," July 26, 2019, https://kstatelibraries.pressbooks.pub/unmannedaircraftsystems/chapter/chapter-10-uas-intelligence-surveillance-and-reconnaissance-isr/.
93 Carter et al., "Chapter 10: UAS Intelligence, Surveillance and Reconnaissance (ISR)."
94 Janes, "Pakistan Integrating TB2 into Air-Defence Network," Janes, October 13, 2022.

stability by ensuring Pakistan can effectively respond to potential threats, reducing the risk of escalatory actions.[95]

Impact on Arms Race Stability

Arms race stability is affected when states feel compelled to continuously develop and deploy new strategic capabilities to match or counterbalance each other's advancements.[96] The introduction of advanced drone technology, particularly by India, has the potential to destabilise this aspect of strategic stability in South Asia.[97]

India's technological buildup, including its investment in autonomous drones, swarm technology, Kamikaze drone, and integration with sophisticated missile systems, signals a clear drive towards enhancing its conventional and counterforce capabilities.[98] This technological edge places pressure on Pakistan to develop its own UAV capabilities to maintain strategic parity. The action-reaction cycle observed in South Asia, where each advancement by India prompts a corresponding response by Pakistan, can accelerate the arms race in drone technology. Pakistan, despite its limited resources, is compelled to invest in advanced drones and integrate them into its military strategy to avoid falling behind in the regional power equation.[99]

This cycle creates arms race instability, as both countries continue to enhance their drone arsenals, potentially upsetting the strategic balance.[100]

---

95 Janes, "Pakistan Integrating TB2 into Air-Defence Network."
96 Kühn, "Strategic Stability in the 21st Century."
97 Ayesha Rana, "Challenges to Strategic Stability in South Asia: An Analysis," *Strategic Studies* 38 (August 9, 2018): 1-20, https://doi.org/10.53532/ss.038.03.00147.
98 Altaf and Javed, "The Triad of Technology and Its Implications for Strategic Stability in South Asia."
99 Iftikhar Ali and Jatswan S Sidhu, "Strategic Dynamics of the Arms Race in South Asia," *Journal of Asian and African Studies*, January 31, 2023, 002190962311531, https://doi.org/10.1177/00219096231153150.
100 David Stevenson, "Conclusion," in *Arms Races in International Politics: From the Nineteenth to the Twenty-First Century*, eds., Thomas Mahnken, Joseph Maiolo, and David Stevenson (Oxford University Press, 2016), 0, https://doi.org/10.1093/acprof:oso/9780198735267.003.0014.

The relentless pursuit of advanced UAV technologies not only increases military tensions but also diverts national resources into a competition that could further exacerbate mutual distrust.[101] The focus on drones as force multipliers and enablers of counterforce capabilities risks undermining any attempts at arms control or confidence-building measures in the region, making the maintenance of arms race stability increasingly challenging.[102]

Prospects for Pakistan and India

Pakistan currently holds a significant edge over India in terms of operationalising advanced drone capabilities. However, as observed in the Ukraine conflict, drones are susceptible to high losses, particularly when lacking air superiority — a potential vulnerability for Pakistan. India's ongoing efforts to establish itself as a drone hub, through civil-military integration, may allow it to rapidly convert civilian drones for military use, thereby increasing its operational flexibility. To maintain its strategic edge, Pakistan must develop its own civilian drone industry; otherwise, it risks being overwhelmed by the sheer number of India's drones and unable to pursue its strategy effectively.

India and Pakistan should take measures to reduce the risk associated with drone's development. Furthermore, India and Pakistan can reduce the risk associated with the development of drones through confidence building measures. Pakistan and India can enhance dialogue on official and semi-official level. Furthermore, both states can extend informal ruling making to maintain strategic stability. For example, Pakistan can do informal rule making related to swarm drones and autonomous drones.

Pakistan Current Joint Chief of Staff said in Shangri-La 2023, "I strongly believe that dialogue should be increased at every official level as should the semi-official and non-governmental dialogues do because at times the track 1.5 or track 2 dialogues become more effective, especially, if they have governmental backing and the agenda is consensual."[103]

---

[101] Podvig, "Blurring the Line between Nuclear and Nonnuclear Weapons."
[102] Candice Carter et al., "Nuclear Weapons," May 9, 2022, https://kstatelibraries.pressbooks.pub/drone-delivery/chapter/nuclear-weapons/.
[103] *IISS Shangri-LA Dialouge 2023*, MP4 (Singapore, 2023).

However, India has shown reluctance in this regard. For instance, in November 2024, Pakistan's resolutions titled, "Regional Disarmament" and "Confidence-Building Measures in the Regional and Sub-Regional Context" were adopted by the UN with broader consensus. These resolutions received 179 votes, and India was the only countries which voted against it. [104]

Furthermore, conflict resolution with confidence building measures is essential to reduce the risk of emerging technologies such as autonomous and swarm drones. However, Indian unilateral steps in Kashmir reduce the effectiveness of CMBs and increase the risk to strategic stability.

Conclusion

The advancements in drone technology by India and Pakistan are reshaping the strategic landscape in South Asia with significant implications for regional stability. India's development of swarm, kamikaze, and autonomous drones has introduced new counterforce capabilities that threaten the region's deterrence stability by potentially targeting Pakistan's second-strike capabilities. Conversely, Pakistan's drone strategy, focused on enhancing its ISR capabilities, aims to reinforce its deterrent posture and ensure a credible retaliatory capacity.

However, these technological developments have also intensified crisis instability. India's technological edge and its integration of drones with precision missile systems increase the risk of misinterpretation and escalation, particularly during periods of heightened tensions. In contrast, Pakistan's use of drones for surveillance and intelligence-gathering enhances situational awareness, offering a stabilising effect during crises.

Moreover, the ongoing technological buildup has triggered an arms race in drone capabilities, with both states engaging in an action-reaction cycle. Hence, arms race is not only disrupting the strategic balance but also diverting resources into military competition, making future arms control and confidence-building measures increasingly challenging.

[104] "UN Panel Adopts Four Pakistani Resolutions on Strengthening Regional, World Peace," November 8, 2024, https://www.app.com.pk/global/un-panel-adopts-four-pakistani-resolutions-on-strengthening-regional-world-peace/

Therefore, policymakers must explore cooperative frameworks to regulate the deployment and development of drones, mitigating the risks of escalation and miscalculation. By addressing these evolving dynamics, South Asia can aim to preserve strategic stability and prevent the disruption of the regional balance of power.