DRONES IN INDIAN SECURITY: LEGAL, STRATEGIC, AND OPERATIONAL PERSPECTIVES - A CRITICAL ANALYSIS OF EMERGING WARFARE PARADIGMS

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Introduction

The emergence of drones as a revolutionizing technology in modern warfare has transformed national security strategic mathematics across the globe. In today's security landscape, unmanned aerial vehicles (UAVs) have evolved from cutting-edge military prototypes to central tools of intelligence, surveillance, reconnaissance (ISR), and kinetic operations. India, situated at the crossroads of complex regional security dynamics, faces multi-dimensional drone-related challenges from cross-border terrorism facilitated through rival drones to the strategic imperative of developing domestic counter-terrorism competencies in the form of sophisticated drone systems.

The relevance of this analysis extends beyond academic investigation to encompass important policy decisions that will shape India's national security framework for decades to come. The defense technology industrial dynamics have been revolutionized by the proliferation of military-grade and commercial unmanned drone platforms, creating new paradigms for both offensive and defensive operations. One of the largest defense deals in Indo-US relations, the recent Indian acquisition of 31 MQ-9B Predator drones from the US worth $4 billion, is a case in point of the strategic value placed on drone technology in contemporary security planning.[1]

The size and sophistication of drone-related security challenges facing India are unprecedented. From the Pakistan-sponsored incursion of payload-delivery drones along the Punjab border to the sophisticated counter-terrorism operations requiring precision strike capability against terrorist facilities, India is facing the entire range of drone warfare vectors. The 2021 Jammu Air Force base attack by purported Lashkar-e-Taiba agents using hijacked commercial drones that were armed with explosives was the first successful terrorist drone attack on Indian military targets, highlighting the evolving nature of the threat.[2]

[1]"India and US sign GA's MQ-9B Predator Drones; Agreement on establishing MRO facility in India," SP Naval Forces https://www.spsnavalforces.com/features/?id=257&h=India-and-US-sign- GAs-MQ-9B-Predator-Drones-Agreement-on-establishing-MRO-facility-in-India (Accessed on 22nd September 2025)

[2]Saumya Joshi, Drone Terror in India: A Challenge to Deter, Vivekananda International Foundation (July 16, 2021) https://www.vifindia.org/article/2021/july/16/drone-terror-in-india-a-challenge-to-deter (Accessed on 23 September 2025)

This analysis is particularly pertinent given India's unique position as a victim of threatening drone operations as well as an emerging power possessing an advanced military drone system operator. The most recent May 2025 India-Pakistan crisis, in which the two nuclear neighbors engaged in the first-ever drone war between them, is a landmark episode of South Asian security trends and forms significant empirical evidence for analyzing the operational use and strategic value of drone technology for conflict in the region.[3]

Core Argument and Thesis Statement

This paper argues that the Indian approach to drone technology in national security is a paradigmatic change from reactive counter-measures towards proactive strategic integration but that this development is still constrained by weak legal frameworks, operational limitations, and the persistent asymmetric threat of the misuse of commercial drone technology by non-state actors. Specifically, while India's acquisition of advanced combat drones like the MQ-9B Predator enhances classic deterrence capability and precise counter-terrorism attacks, the absence of comprehensive domestic law to govern drone operations combined with the proliferation of cheap commercial drones to terror networks creates a long-term security challenge that must be met by integrating coherent legal, technical, and operational responses.

Legal Framework Governing the Operations of Drones in India

The legal framework governing the operations of drones in India remains scattered and underdeveloped to adequately address the complex threats emanating from both civilian and military uses of drones. The primary system of regulation is the Drone Rules 2021, subsequently amended in 2022, primarily addressing civilian usage but having little to say regarding military applications or counter-terrorist activities.[4] This lacuna within the regulations becomes progressively problematic when regard is had to cross-border drone threats and the legal obligation for kinetic action.

The constitutional framework for drone operations must be interpreted in terms of Article 355 under which the Union is empowered to protect states from external hostility and domestic

[3]*Operation Sindoor and the Battle of Perception: How Pakistan Shaped the Narrative and What India Must Do*, Vivekananda International Foundation (June 3, 2025), https://www.vifindia.org/article/2025/june/03/Narrative-Shaping-Amid-Battlefield-Losses-How-Pakistan-Skewed-the-Story-of-Operation-Sindoor (Accessed on 23rd September 2025)

[4]Home, Government of India https://www.dgca.gov.in/digigov-portal/?page=jsp/dgca/InventoryList/headerblock/drones/RPAS.html (Accessed on 23rd September 2025)

unrest. However, its enforcement in terms of drone-based threats raises challenging questions about the trigger for military action and geographical boundaries of national sovereignty over air space. The absence of special law that governs armed military drone use raises concerns about command control, rules of engagement, and systems of accountability for autonomous or semi-autonomous vehicles.

Current court rulings do not provide much insight into legal issues surrounding drones. The Supreme Court's approach to surveillance technology, as seen in judgments like Justice K.S. Puttaswamy (Retd.) v. Union of India (2017), establishes privacy protection tenets that can be restrictive on local drone surveillance operations. However, their application to military drone missions along borders or counter-terrorism contexts is yet to be tested in court.[5]

The international law dimension is also complex. Indian drone operations must be guided by the tenets of international humanitarian law (IHL), i.e., distinction, proportionality, and precaution, as set out in the Geneva Conventions and their Additional Protocols. The May 2025 cross-border drone strikes against terrorist assets in Pakistan under Operation Sindoor raise questions about the legal justification for cross-border kinetic operations and respect for sovereignty norms under international law.

Analysis of Cross-Border Drone Threats

Empirical data regarding cross-border drone incursions reflect the scope and degree of threat represented to India. Punjab experienced a four-fold increase in cross-border drone activities between 2020 and 2022, with 267 detected drones representing 83% of all reported activities along the India-Pakistan border in 2022. These statistics likely underrepresent the actual degree of threat, given that they reflect detected—not necessarily interdicted—drone activity[6].

The counter-operational character of adversary drone activities demonstrates a higher degree of sophistication in tactics, techniques, and procedures. Intelligence estimates indicate that Pakistan's Inter-Services Intelligence (ISI), along with Pakistani Rangers, has set up at least six drone hubs with unique features to facilitate cross-border missions.The hubs oversee the deployment of different drone platforms from commercial DJI Matrice 300 RTK quadcopters

[5]K.S. Puttaswamy (Retd.) v. Union of India, (2017) 10 SCC 1

[6]Sameer Patil, Countering Hostile Drone Activity on the India-Pakistan Border, (June 10, 2024), https://www.orfonline.org/research/countering-hostile-drone-activity-on-the-india-pakistan-border (Accessed on 23rd September 2025)

with payloads of up to 9 kilograms to one-off drones that are built using different frequencies to evade detection systems.

The scanning of the payloads recognizes the dual-use nature of the threat. From 2020 to 2023, there have been seizures of drones with 125.174 kilograms of heroin, 0.100 kilograms of opium, weapons including pistols and ammunition, and explosive material including detonators. This evidence shows that terrorist groups employ the same platforms to use for criminal funding through drug trafficking as well as actual terrorist operations through weapon and explosive delivery[7].

The forensic analysis of intercepted drones provides insightful information on operational and supply chain procedures. One significant disclosure was of a quadcopter that illegally entered Amritsar from Pakistan, whose flight pattern indicated not only operations within Pakistan but also in China and suggested the potential for technology transfer and training relations.Based on this evidence, it can be assumed that the drone threat in India is not merely that of Pakistani state or non-state actors but potentially far-flung international networks with access to Chinese technology and technical knowledge.[8]

India's Drone Operations for Counter-Terrorism

India's counter-terrorism drone operations mark a strategic shift from passive postures to active confrontation, culminating in the record Operation Sindoor in May 2025. Operation Sindoor was India's first large-scale military deployment of drones against terrorist infrastructure, striking nine terrorist bases of Jaish-e-Mohammed and Lashkar-e-Taiba spread throughout Pakistan and Pakistan-occupied Kashmir.

These operations' operational doctrine mark far-reaching strategic shifts in India's approach to cross-border terrorism. Prime Minister Modi's post-operative announcement that Operation Sindoor "cut out a new benchmark in our war against terrorism" articulates three key precepts of doctrine: delivering "fitting responses" to terrorist attacks, not giving an inch of space to nuclear blackmail while being prepared to target terrorist hideouts, and not discriminating

[7] Drone Intrusions Along the India-Pakistan International Border: Countering an Emerging Threat, Carnegie Endowment for International Peace https://carnegieendowment.org/posts/2023/07/drone-intrusions-along- the-india-pakistan-international-border-countering-an-emerging-threat?lang=en (Accessed on 24th September)

[8] *ResearchGate*,https://www.researchgate.net/publication/392909095_An_Analysis_of_the_2025_India-Pakistan_Crisis_Examining_Claims_of_Premeditated_Nuclear_Strikes_ (Accessed on 24th September).

between state-sponsored terrorism and its creators. These precepts establish a new standard for military retaliation against terrorist aggressions, lowering the bar for kinetic action.

The technical expertise employed in Operation Sindoor demonstrates India's advanced drone war capabilities. Indian forces have used Harop loitering munitions from Israel Aerospace Industries, according to intelligence sources, which possess autonomous target recognition and independent attack capabilities.[13] These "kamikaze drones" are far more superior compared to traditional missile systems, offering higher accuracy, less collateral damage, and greater survivability against air defense systems.

The strategic success of these operations can be measured by Pakistani responses and damage estimates. Though Pakistan claimed destruction of 84 Israeli-supplied Harop drones, independent sources state that it caused significant damage to terrorist training facilities and logistical infrastructure.[14] Success in the operation means that India has acquired credible precision strike capability with the ability to penetrate Pakistani air defense and knock out high-value targets with low collateral damage.[9]

The MQ-9B Predator Acquisition and Strategic Significance

India's purchase of 31 MQ-9B Predator drones is the largest injection of drones into its fleet in decades. The $4 billion split between the three services (15 for the Navy, 8 for the Army and 8 for the Air Force) makes India the largest world operator of MQ-9B systems, even larger than NATO allies in sheer number of aircraft.[15]

The value of this acquisition is strategic and extends beyond capability enhancement to encompass core elements in India's deterrence posture and operational doctrine. The capabilities of the MQ-9B—40-hour mission time, 50,000-foot operating altitude, and 1,800-kilometer range—bring persistent surveillance and strike capacity across the whole of India's periphery.[16] Detection by civilian air traffic control is facilitated through enhanced detect-and-avoid systems, which allow inter-theater deployment in times of peace.

The MQ-9B system's potential for technology satisfies specific operational requirements achieved through India's experience with leased SeaGuardian drones. Indian Navy's experience

[9] "India To Assemble 21 MQ-9B Predator Drones," Indian Defence Research Wing https://idrw.org/india-to-assemble-21-mq-9b-predator-drones-general-atomics/. (Accessed on 24th September)

of operating two MQ-9Bs since 2020, despite losing one aircraft in the Bay of Bengal in September 2024, provided precious operational experience that shaped the big-ticket purchase decision. Its effective deployment in anti-piracy operations, including the 40-hour operation to save hijacked merchant vessel MV Ruen, demonstrated its operational value in India's maritime security scenario.

The industrial implications of the MQ-9B contract extend beyond immediate capability acquisition to also encompass long-term strategic partnerships. General Atomics Global Corporation CEO Vivek Lall revealed that 21 of 31 acquired unmanned aerial vehicles would be produced in India through partnerships with companies like Bharat Forge, Hindustan Aeronautics Limited, and Bharat Electronics Limited. The deal encourages the "Make in India" initiative while creating indigenous capability for future UAV development projects.[10]

Operational Effectiveness and Restraints

Operational deployment of drone technology in India's security environment reveals deep potential and persistent restraints. The May 2025 crisis provided unrivalled empirical substantiation of the effectiveness of drone warfare in South Asia. Indian drone operations transgressed Pakistani air defenses and struck numerous targets, while Pakistani retaliatory drone attacks continued to fail due to Indian anti-drone devices.

However, operational limitations of current systems remain significant. Foremost among them is communication range and dependency upon satellites. India's present Israeli-source drones (Searcher and Heron platforms) lack satellite communication links and hence are limited in their operational distance from ground stations to 150-200 kilometers. This constraint severely limits their potential for deep-strike missions or extended maritime surveillance tasks.

The performance of the counter-drone is significantly different across types of threats. While India has achieved to develop effective responses against large military drones, the threat posed by small commercial drones remains. The threat of swarm attacks by modified commercial drones, such as observed in Houthi attacks on Saudi Arabia in 2019, remains a vulnerability for India's air defense.

[10]*India To Assemble 21 MQ-9B Predator Drones: ViveK Lall*, Bharat Shakti (Mar. 19, 2025), https://bharatshakti.in/india-to-assemble-21-mq-9b-predator-drones-vivel-lall/. (Accessed on 24th September 2025)

Weather and ground limitations also restrict operation performance. High-altitude operations along the Line of Actual Control create challenges for unmanned aerial vehicles not specifically designed for extreme altitude performance. Thin air and demanding weather in Himalayan terrain reduce payload capacity and endurance for standard military unmanned aerial vehicles, requiring specialized systems for effective operations.[11]

Modern Challenges and New Threats

Technological Proliferation and Asymmetric Threats

Democratization of drone technology presents possibly India's biggest challenge to security complex. Commercial off-the-shelf (COTS) drone platforms that civilians can buy are easily converted for terrorist use with minimal technical sophistication. The 2021 Jammu Air Force base attack utilized modified commercial drones with improvised explosive devices, showing the potential for consumer technology to be turned against military targets.

The proliferation challenge is also intensified by the global supply chain for drone components. Drones that are sold commercially are dominated by Chinese manufacturers, led by DJI, and raise concerns of embedded monitoring functionality or remote-access backdoors that could be exploited by hostile powers. Chinese operational patterns seen in captured Pakistani drones show potential technology transfer agreements that extend the threat beyond regional players to include global actors.

Offensive over defensive use of drones is cost-benefit preferable for attackers. A $1,000 commercial drone weaponised with explosives can go on to incur millions of dollars of damage on military installations or critical infrastructure. The asymmetric cost relationship of this sort makes it expensive and strategically unaffordable to defend against drone swarm attacks for some time for conventional military forces.

Legal Gaps and Regulatory Challenges

The existing legal framework does not address many of the central drone warfare questions. Absence of pre-established rules of engagement for autonomous or semi-autonomous systems leaves unclear human control requirements and responsibility for unintended consequences.

[11]Countering Hostile Drone Activity on the IndiaPakistan Border
https://www.orfonline.org/public/uploads/posts/pdf/20240610195421.pdf (Accessed oon 24th September)

With India's advance toward increasingly autonomous drone militaries, the legal framework must engage the ethical and legal implications of machine-initiated lethal action.

Jurisdictional uncertainties introduce further complexities. Drone operations across borders prompt issues of territorial sovereignty, observance of international law, and escalation control. Legal authority to pursue hostile drones into third-country territories or international air space is unclear, and this may limit operational effectiveness in pursuit missions.

The civilian-military drone integration issue calls for a revamp of regulatory reform. As military and civilian drone activities take the same skies to a larger extent, coordination measures are required that prevent conflict but guarantee operational security for military activities. Regulations that facilitate harmonious integration between civilian aviation agencies and military drone operators are lacking in the current regulatory structure.

Strategic Recommendations and Future Directions

Strategic Legal Framework Making

India requires putting in place all-encompassing laws on the entire range of drone activities, from civilian commercial use to military combat operations. The normative framework must enunciate clearly demarcated command and control mechanisms, rules of engagement for autonomous systems, and regimes of responsibility for drone activities. The law must incorporate international humanitarian law obligations and operational freedom to address legitimate security imperatives.

The intended framework should ensure emergency response systems, cross-agency coordination mechanisms, and routine review procedures to address new technologies. Special attention should be given to mandating the trigger point for kinetic actions against drone menace and guaranteeing clear lines of command for cross-border operations.

Technological Development and Industrial Base Enhancement

India needs to accord the highest priority to the indigenisation of drone development efforts and foreign cooperation in technology transfer. GHATAK Unmanned Combat Aerial Vehicle development project under progress at DRDO is a significant step towards strategic autonomy

in high-tech drone capabilities. However, accelerated timelines and increased budgetary support are necessary to achieve operational parity at the international level.

Establishment of end-to-end counter-drone capabilities needs to be assigned the topmost priority. This will involve the installation of layered defense systems comprising radar detection, electronic warfare, kinetic interceptors, and cyber defense for countering drone swarms. Artificial intelligence and machine learning integration for autonomous threat detection and reaction will be central to managing high-volume, low-cost drone threats.[12]

International Cooperation and Diplomatic Engagement

India needs to take the lead in global talks for regulating drone warfare as well as autonomous weapons systems. Talks need to be in a direction to establish standards for using drones responsibly without sacrificing India's legitimate security interests. Bilateral cooperation agreements with strategic partners, particularly the United States and Israel, need to have technology transfer and collaborative development programs on a top priority.

Local confidence-building in the use of drones can reduce risks of escalation without compromising deterrence capability. Having procedures for communication, notification, and incident inquiry with neighboring countries can prevent minor conflicts initiated by drones from escalating into large-scale wars.

Conclusion

The research concludes that India's adoption of drone technology in its national security context presents both significant opportunities and persistent challenges. While the acquisition of advanced systems like the MQ-9B Predator enhances conventional military capabilities and provides new avenues for counter-terrorism action, the asymmetric threat emanating from commercial drones operated by non-state actors represents a latent security challenge.

Secondly, India's drone capability has transformed from largely defensive deployments to include significant offensive capabilities, as witnessed by Operation Sindoor. However, this

[12] Drone Intrusions Along the India-Pakistan International Border," Carnegie Endowment https://carnegieindia.org/regions/pakistan?center=india&lang=en (Accessed on 24th September)

transformation has been accomplished without adequate accompanying legal evolution, and in the process may be creating accountability lacunae and operational uncertainties.

Second, proliferation of commercial drone platforms creates persistent weaknesses that cannot be properly addressed by traditional air defense systems. The cost benefit in favor of offense-focused drone operations creates the need for novel defensive measures emphasizing electronic warfare, cyber warfare, and AI-based detection systems.

Third, regional security implications of drone warfare extend beyond bi-lateral India-Pakistan dynamics to encompass broader strategic relations with world powers. Chinese technology involvement in Pakistani drone operations and dependence on Israeli and American systems by Indian capabilities exist as complex strategic dependencies requiring diplomatic management.

Recommendations for Policy Reform

Legal and Regulatory Framework: Enact comprehensive drone warfare legislation with clearly established command and control systems, rules of engagement, and accountability frameworks. The framework must address both military and civilian integration needs as well as international humanitarian law obligations.

Technological Development: Foster indigenous development initiatives for drones while maintaining strategic alliances for technology collaboration. Counter-drone technologies, autonomous systems development, and infusion of stealth technology into next-generation platforms are to be prioritized.

Operational Integration: Develop comprehensive doctrine for tri-service operation of UAVs with a focus on joint training, interoperability, and harmonized command arrangements. Develop specialist UAV warfare units with tailored training schemes and career paths.

International Engagement: Be proactive in participating in global governance negotiations on drones while developing bilateral cooperation agreements with key partners. Focus on establishing norms on the responsible application of drones and preventing an arms race environment in the region.

Industrial Base Growth: Support development of integrated drone production and maintenance centers in India, based on the MQ-9B assembly agreement as an example for broader industrial growth. Promote the private sector while maintaining strategic control of critical technology.

The path forward is to recognize that drone technology is more than another new military power but a revolutionary agent that remakes fundamental assumptions of warfare, deterrence, and national security. Indian success in coping with this revolution will depend on developing integrated strategies that marry technological innovation, legal framework construction, and diplomatic strategy while keeping focus on the fundamental objective of securing national security within increasingly complex threat landscapes.

The final test of success will be the success of India in exploring the potential of drone technology without unleashing its perils, so that these tools of tremendous power act to consolidate and not disintegrate the security and stability of the region. This requires steadfast commitment to responsible growth, visionary planning, and adaptive governance institutions which can keep up with the fast-growing pace of technological evolution in the field of drone warfare.

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