The Salience of Air Power in Accelerating Land Operations Across Various Terrains

Diptendu Choudhury

Abstract

India's persistent continental threat has ensured that employment of force through the medium of air has not only remained vital, but has become increasingly definitive in military strategy and outcomes. An analysis of the air power roles undertaken by the IAF towards the land campaigns in all the wars brings out one fact clearly. That is, along with the land operations of the Indian Army which have been fought in diverse geographical terrains, the IAF too has fought alongside in each of them, in a wide variety of roles. Each terrain type presents unique operational advantages and challenges for both land and air warfare, and also provides synergistic employment opportunities, tailored to the adversary-specific warfighting requirements. The IAF has immense capabilities critical in accelerating land operations in all terrains, provided it is synergised at every level from planning to execution.

Air Marshal **Diptendu Choudhury**, PVSM, AVSM, VM, VSM (Retd) a fighter pilot and scholar, is a former Commandant of the National Defence College, New Delhi.

Introduction

In the history of India's wars, with its unique threat and geographical environment combined with the regional dynamics, the contribution of air power in the land campaigns has been consistent. From the Burma Campaign, 1947-48, 1965, 1971 and 1999 Indo-Pak Wars, and the 1962 Indo-Chinese War, India's persistent continental threat has ensured that employment of force through the medium of air has not only remained vital, but has become increasingly definitive in military strategy and outcomes. This is especially so since over the years while our adversaries have remained the same, there has been a threatproliferation across all domains, an expansion in the spectrum of warfare ranging from the non-conventional to the hybrid, and a blurring of the normative ideals of warfare itself. With two enemies with whom India shares long and hostile borders-one near-peer and one stronger-who share an enduring strategic relationship and an extensive military one, the possibility of a 'two-adversary-multi-front' war remains a reality. Throw in conflict terrains that range from salt marshes, deserts, the obstacleridden developed sector of the plains on the West, the harsh climatic high altitudes of the North, and the densely forested hilly jungle terrain of the North East, and India's comprehensive military challenges are like no other in the world. In this complex threat scenario, given that both strong opposing Air Forces form an integral part of their respective military strategies, the salience of air power in India's future military strategy needs a fresh approach. Thankfully, history provides invaluable lessons and insights, both in overcoming past mistakes, and finding newer ways to do business.

Home Truths

In the Burma campaign, the Indian Air Force flew over 16,000 missions of Army cooperation, as it was called earlier, consisting of bombing, interdiction and close air support sorties, to great effect.¹ In the Kashmir

War of 1947-48, the entire fighter operations were almost entirely for assisting Army operations.² Despite the ground attack experience of past wars and the significant offensive air power capability, the IAF was unfortunately not offensively committed in the 1962 war with China, a regret that continues to haunt the military and the nation. In the 1965 war against Pakistan, 60 per cent of fighter sorties were towards Counter Surface Force Operations (CSFO).³ In the 1971 Bangladesh war, which was Despite the ground attack experience of past wars and the significant offensive air power capability, the IAF was unfortunately not offensively committed in the 1962 war with China, a regret that continues to haunt the military and the nation.

the first- and only-time air power was used without any constraints or restrictions, the CSFO effort was 52 per cent.⁴ In Kargil, it constituted 46 per cent of the air effort. These figures do not include the thousands of helicopter and transport sorties flown in each war, exclusively towards air assistance and logistics.⁵ The very basis for joint warfare lies in three basic undeniable truths-Army's need for offensive air power for its concentrated firepower, depth of penetration, and speed; its vulnerability to enemy air; and the AF's ability to provide these. An analysis of the air power roles undertaken by the IAF towards the land campaigns in all the wars brings out one fact clearly. That is, along with the land operations of the Indian Army which have been fought in diverse geographical terrains, the IAF too has fought alongside in each of them, in a wide variety of roles. But given the disparate sizes of the two Services, there is bound to be a gap in the future Coordinated Air Operations (formerly CSFO)⁶ expectation of the Army, and the AF's ability to meet it. This is especially so, since the latter also has an equally significant role to play in wresting a certain degree of control of air for all military operations, and for strategic air operations against strategic military assets and But unlike in the past, where counterair campaign was the precursor to offensive air operations, the IAF today executes them simultaneously in parallel from day one, as it will in the future.

infrastructure, war-waging and economic targets in depth, well beyond the tactical battlespaces. Thus, "understanding the larger responsibilities of air power at the national level and its inclusion in the larger military strategy, will serve the interests of Jointness better".⁷

Coordinated Air Operations: Future Air Power Roles

Though misunderstanding of the much-debated 'control of air' remains alive amongst some, it has long become a key warfighting imperative for militaries world over. Mellinger posits that "whoever controls the air generally controls the surface",⁸ it provides the land forces with the freedom of action while reducing vulnerability to the enemy's aerial attacks. In the Indian context, it is especially important as both its adversaries are capable of seriously threatening friendly forces from the air and directly impacting land operations. The 1971 war, where the IAF achieved air supremacy in the East and air superiority on the Western Front, underscores the importance of a degree of control of the air. Muqueem wrote-"The defensive strategy of the PAF in fact, gave the IAF a free hand to interdict Pakistan communications and other strategic targets and keep pressure on Pakistan troops in the forward areas. The situation as it emerged seemed that, while the PAF managed air superiority in their bases, the IAF could operate without hindrance in the forward areas and over Pakistani vital communications along her borders."9 In future wars, favourable air situation (FAS) and limited sectoral air superiority, are the best that can be expected in highly contested, and contested airspaces, respectively. But unlike in the past, where counter-air campaign was the precursor to offensive air operations, the IAF today executes them simultaneously in parallel from day one, as it will in the future. Since, "Control of air

is vital for the successful execution of a nation's military strategy, joint operations and Service-specific operations, the degree of control of the air directly impacts the extent and effectiveness of Air-Land operations,"¹⁰ and therefore it must be a part of the nation's military strategy.

An overlooked vital takeaway from the 1971 war was the efficacy of interdiction and depth strikes on surface operations. In the East-"a little over two-thirds of IAFs air effort was in direct support of the Indian Army in the land battle",¹¹ which was able to severely disrupt the road, rail and waterways networks, over and above counterforce targets. In the Western sector, "long-range interdiction cut down Pakistan's ability to reinforce battle areas"12 with systematic attacks on road and railway networks, ammunition and fuel dumps, key bridges, etc. Strategic targeting impacted the fuel supplies and power generation capacity-"its fuel supplies became extremely scarce and fuel had to be imported in tankers by road from Iran."¹³ IAF's contemporary warfighting repertoire and concepts of operations have long been focused and dedicated to joint operations, and the achievement of the larger military objectives. And even today, 80 per cent of its offensive targeting includes strategic centres of gravity, deep strikes against enemy target systems of combat forces and reserves, and air interdiction (AI) of infrastructure, fuel, ammunition and combat logistic nodes, enemy road-rail communication systems, troop concentrations, command and control nodes, etc. Interdiction operations are vital to "destroy, neutralise or delay the enemy's reinforcements, supplies, or strategic military potential before it is brought to bear in the battlefield, to isolate the enemy forces in the battle zone and restrict his freedom of manoeuvre" and "their effects are cumulative, and must continue to degrade the war-fighting capacity of the enemy's land forces. Joint planning and coordination of fire are key to effective AI".¹⁴ And it must be emphasised here that interdictions and is a part of its coordinated air operations, is over and above battlefield air strikes (BAS).

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Close air support (CAS) or BAS as it is called today, remains the most challenging of all air power roles through history, and has been the key source of all dissent between Armies and Air Forces world over. Camouflage, concealment and dispersion of targets, identification of the enemy, and distinguishing them from friendly forces to avoid fratricide, are challenges which remain. US aviators argue that CAS merely duplicated the

abilities of artillery, whereas interdiction provides a unique capability, US infantry officers contend that with artillery being rarely available in sufficient quantity, the flexibility of air power enables massing firepower at critical points, and also produces a greater psychological effect on friendly and hostile forces alike.¹⁵ In the Korean and Vietnam War, senior Army generals believed that air power primarily was a source of firepower to augment ground artillery, essentially in support of localised ground combat. They wanted that there should be some minimum number of CAS sorties provided per unit per day that could not be taken away. They also wanted entire Air Force fighter units placed directly under the operational control of the field army commander, ignoring the limited aircraft resources, which may or may not be used given the large demand for platforms for other mandated missions. This contradictory viewpoint has persisted in all US wars including the Gulf War, where CAS formed only 26 per cent of all the sorties flown during the five-day ground war, most of the missions actually became interdiction during execution. Post-war analysis concluded that tactical air power was used as it has always been used in the past. It was not integrated into the ground scheme of manoeuvre, and once again CAS was flying artillery.¹⁶ Despite the persistent coincidences in thinking amongst some in the Army, the IAF is acutely aware of the

importance of BAS. Its doctrine highlights the need for joint planning, disposition of own forces, integration and close coordination of the fire plan, electronic warfare and communications jamming, tactical ISR, and crucially, airspace coordination with the integrated air defence operations, over the tactical battlespaces which directly impact the efficacy of BAS. Since proliferation of man-portable air defence systems (MANPADS) raises the safe operating envelope of air operations— unlike in the past— it will reduce the 'visibility' of BAS efforts to the troops on the ground.

Aerial reconnaissance, with whatever limited assets are available, has played a vital role in all wars. While in 1947 surface operations were mostly dependent on aerial recce, in all subsequent wars photo recce (PR) missions revealed vital dispositions and movement of the enemy. Shortage of assets and centralisation of this role led to inordinate delays in the 1965 war,¹⁷ which in 1971 with an increase of Fighter Recce (FR) capability was invaluable,¹⁸ but post-mission photo development, analysis and dissemination from a joint perspective, emerged as an area needing attention,¹⁹ as also brought out by Candeth,²⁰ and Krishna Rao.²¹ Today, space-based constant stare is needed over designated areas in depth, for close monitoring of the enemy key ports, airfields, road-rail-river communication hubs, strategic assets, military reserves, missiles and air defence assets, etc., and equally importantly to provide targeting imagery. At the operational levels, up to depths of 40-50 km, fighter recce, and specialist platforms, with stand-off imagery capability will be vital. Though Intelligence Surveillance and Reconnaissance (ISR) capability has expanded with space-based imagery, key challenges of persistent stare capability, time-criticality, and analysis capacity remain.

Considering the wide swath of coverage desired across our long borders and vast hinterland depths of the adversaries, four important factors must be considered. First, ISR assets and their utilisation will always be at premium, given the limited availability of indigenous satellites, limited dedicated aerial ISR and EW platforms, and limited

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ground environmental stations (GES) for download, analysis and dissemination. Second, their limited availability compels centralised utilisation. Third, is the vulnerability of tactical aerial assets to enemy air defence. This makes use of remotely piloted aircraft extremely vulnerable to MANPADS, and they can only be employed in benign air defence environments. Even then, they would

be vulnerable to enemy fighters with long-range beyond visual-range missiles. The use of small drones are a viable option, but are limited by their range, area of coverage and the choice of sensors. And finally, weather and environmental conditions impact ISR, and therefore multisensor capability is a necessity.

AD is the veritable glue which underpins each and every air operation, directly impacts the level of enemy interference in land operations, and is a conjoined twin of offensive air operations. It involves defensive and offensive missions for the protection of friendly airspaces, civil and military assets, and most importantly ensures freedom of own air and surface operations. Defensive Counter Air (DCA) also includes combat air patrol (CAP) missions over its own territory, to protect civil and military assets and tactical battlespaces against enemy air strikes and their air defence aircraft, and allow friendly BAS to operate safely. Offensive Counter Air (OCA) comprises of hi-tech air defence fighters tasked to ingress into hostile airspace to draw out and shoot down enemy CAP before friendly strikes enter. Depth strategic strikes and high-priority interdictions are covered by these missions in time and space, and also provided with dedicated AD escorts wherever necessary. BAS are covered by these missions when in the vicinity, else are provided air defence by TBA CAPs. The volume of air defence surveillance coverage today has expanded exponentially with advanced radars capable of vast threedimensional airspace coverage. IAF's extended integrated air defence (IAD) is a multi-tiered 'system of systems' with an array of radars and multiple surface-to-air guided weapons (SAGW) of different capabilities and engagement ranges, integrated and arranged in tiers, which provides a much larger area of air defence coverage. Combined with long-range SAGW like the S-400 Triumf, the offensive air defence coverage extends well into adversarial airspaces, capable of shooting down air threats over their own territory.²²

Across Terrains: Leveraging Air Power

"The swift and extensive offensive air power activation in the Ladakh crisis of 2020, with a clear intent to undertake all operational tasks and provide support to the entire range of military operations envisaged in a possible high-altitude conflict, was a display of asymmetric deterrence of India's offensive air power capability".²³ Similarly in the 2019 Balakot strike, the ability to penetrate Pakistan's robust air defence system and decision cycle, to carry out a stand-off precision strike well inside its territory was clearly demonstrated by the IAF. Both these are indicative of its presentday significant operational capabilities, which are kept honed across all terrains of envisaged land operations, despite the reduced combat bench strength. Each terrain type presents unique operational advantages and challenges for both land and air warfare, and also provides synergistic employment opportunities, tailored to the adversary-specific warfighting requirements.

In the Rann and the desert sector, the terrain, relatively lesser obstacles, and population density, enable speed and depth of penetration, rapid manoeuvre, and a higher possibility of success for an offensive air-land operation. The coastal sector, with its high density of strategic targets, makes it a centre of gravity for a synchronised offensive pincer of air-sea operations. Offensive counter air of the front-tier active air

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bases, to reduce the flexibility and level of interference of the enemy air, is essential for swift manoeuvre warfare. Offensive air defence and extensive interdiction will enable strategic isolation of the Southern sector, by targeting the vulnerability of its linear road-rail-river communication system, which forms a part of the strategic China-Pakistan Economic Corridor. Stand-off precision weapons and longrange vectors will be effective for strategic targeting in-depth, and minimising civilian collateral in urban areas. Fighter and attack

helicopter BAS will be most effective in this sector given the terrain and the nature of surface operations likely.

In the developed sector with its densely populated obstacle-ridden terrain, the land campaign in all probability will be a force-on-force attritional one. Given the strategic importance of Punjab to Pakistan, the battlespaces here will be highly contested both on the ground and in the air. Here, the greatest asymmetric advantage will be the high volume and intensity of IAF's offensive operations demonstrated during Exercise Gagan Shakti in 2018, which will invaluable.²⁴ Given the concentration of high-value target systems of military infrastructure, reserves, C2, key airfields, power, energy, logistics, communication nodes, etc., depth strikes and interdiction will be invaluable for shaping land operations by isolating critical battlespaces. Since this region has the highest density of quality PAF assets and SAGW systems, Suppression of Enemy Air Defence (SEAD), offensive and defensive counter missions will be preponderant to all air and land operations. Being a highly contested air and battle space, FAS will be contested, and combined with the high density of MANPADS, fighter BAS will be a challenge-while attack helicopter

and RPA missions will be extremely high risk. The offensive capability of IAF's IAD and IA's air defence systems will play a critical role in this region. The high possibility of threat from the enemy air in the initial days, will need dynamic mobility for their safety, which will impact their 24x7 availability. Standoff precision targeting will be needed for highvalue interdiction to increase mission survivability, and reduce civilian collateral damage in the high-density urban areas. The need for close integration of IA and IAF AD assets, excellent air space management, near continuous tactical ISR, and closely synergised tactical fire-plan, will be definitive for the success of land operations. In the plains, unlike in 1971, large-scale airborne operations even by night are unviable in highly contested air spaces. However, it may be possible on a smaller scale in benign airspaces, dictated by opportunity.

In the North West, the immense learning post-Balakot activation, combined with the retained lessons and skillsets of Kargil, will pay dividends in all air operations in this region. Challenges in radar and SAGW coverages will make control of air dynamic and therefore, counter air against key airfields here will dictate the efficacy of all operations, especially in the North. The enemy's operations have followed a repetitive pattern in all the wars in this region, and the weight of IAF's offensive thrust in the Punjab region will affect the quantum of enemy air effort in the region. BAS will be constrained by enemy air defence, predictable attack directions, and target acquisition challenges due to the terrain. Therefore, interdiction of vital communication networks, logistic nodes and artillery positions will be more effective, and offensive helicopter operations will be governed by their high-altitude capabilities and hostile air defence. Preserving our own airfields which are vital for the troop and logistic movements, safety of inter-valley troop movements, and safety of our key communication lifelines, will need dedicated air defence in this region. Special operations by air will be effective with tactical use of terrain cover and darkness.

Depth offensives against the enemy's layered defences will be possible only by the IAF, by extensive parallel targeting.

Against China, the dynamics of land operations are significantly different. Targeting the deployed People's Liberation Army (PLA) forces, military assets, logistic nodes and communication infrastructure,²⁵ will be vital in IA's defensive operations. Interdiction behind the frontlines and at intermediate depths, along with simultaneous targeting of

depth strategic military assets, will shape the operations. PLA Air Force's inability to exercise air superiority in the region,²⁶ coupled with the IAF's offensive capabilities, provides an asymmetric advantage for high-altitude land operations. Given its limited air-to-ground strike ability, China has attempted to compensate it by the ballistic missiles of the PLA Rocket Force, against the IA's target systems and IAF bases.²⁷ But their total numbers in the theatre, warhead capacity and accuracy, vis-à-vis a large number of IA targets, number of IAF's bases, its dispersal plans and use of civil airfields, mitigates much of the risk. Also, China's critical vulnerabilities on its Eastern and Southern sea boards, and the large geographical distances in between, reduce the options of redeploying them against India. The weapon and deployment densities, which are presently specific areas of China's focus against India in Ladakh and Arunachal Pradesh, will keep the IA engaged in the assessed like-for-like retorts.²⁸ Depth offensives against the enemy's layered defences will be possible only by the IAF, by extensive parallel targeting-in the frontages to assist the IA in its defensive operations by keeping the PLAAF off its back, and targeting PLA's offensive elements; in the intermediate depths, to cut off the logistic and communication lifelines; and in the depths, to target the PLAAF on the ground by striking its key air bases in the region,²⁹ its fixed air defence radars and missile sites, its aircraft and UAVs in the air, and identified long-range vector deployments. Penetrating the region's equivalent of Anti-Area-Access-Denial deployment will therefore

be critical not only to all IAF operations, but it will also be the deciding factor in giving the IA, with its significant high-altitude warfare experience and skills, a fighting chance.

The terrain dictates that the majority of the assistance to the IA will be interdiction heavy like in the Kargil war. BAS will face similar challenges as in the North, and will be a challenge in the dense jungle terrain of the North East. The enemy air defence deployment will necessitate the IAF to use terrain masking tactics for penetration and targeting. This is where its vast professional experience and relentless training in offensive strikes, SEAD, and air-air combat will enable it to breach the regional A2AD, by going 'below, above, and around' it, using multi-mode penetration, saturation, decoying, etc.-skill-sets which the IAF regularly trains for. The current advantage of force ratios, better payload capacity, higher mission rates, larger number of airfields, dispersed launch and recovery capabilities at lower altitudes,³⁰ swift turn-around between missions, airair refuelling (AAR) and AWACS/AWEC integration, long-range multimission offensive air defence capabilities, will all play a significant role in carrying the fight to the enemy. Coordinated offensive air and air defence operations will enable the IA to even carry out limited offensives. Spacebased ISR will be critical.

CLAWS

End Thoughts

Air power has lots to offer, but it has not been leveraged adequately and has been restrained in all past wars, except for 1971. Today, despite the reduced numbers, the IAF has immense capabilities critical in accelerating land operations in all terrains, provided it is synergised at every level from planning to execution. While structural military reorganisation is some time away,³¹ there are enough robust organisational structures to enable true joint planning and execution. Bolstering IAF's ISR, EW, long-range air defence systems and standoff precision targeting capabilities, IA's BAS communications and investing and integration of GES with IAF's ISR,

plugging in IA's air defence assets into IAF's IAD, will prove invaluable. Joint planning, conduct and analysis of adversary-specific joint exercises will enable development of realistic and implementable concepts of operations. Mutual trust, faith and respect are the Sine Qua Non.

Notes

- 1. Jasjit Singh, Defence From The Skies (KW Publishers, New Delhi, 2013), p. 40.
- 2. Bharat Kumar, An Incredible War (KW Publishers, New Delhi, 2013).
- 3. PVS Jagan Mohan and Samir Chopra, The India-Pakistan Air War of 1965 (Manohar Publishers, New Delhi, 2009), p. 302.
- 4 ACM PC Lal, My Years With The IAF (Lancer International, 1986).
- 5. Diptendu Choudhury, Jointness: An IAF Perspective, India@75 Reflections, Perspectives, Challenges (KW Publishers, New Delhi, 2023), pp. 20-29.
- 6. Coordinated Air Operations are carried out for and in coordination with land and maritime forces, emerging from the military strategy. It includes all air operations carried out in cooperation or in direct coordination with friendly surface forces to deter, contain neutralize or defeat the enemy's surface forces over land and sea. From the Army's perspective Air-Land Ops include Air Interdiction and BAS. Doctrine of the IAF, IAP2000-22, Air HQ, New Delhi, pp. 53-54.
- 7. Choudhury, n. 5, p. 26.
- 8. Philip S. Mellinger, Ten Propositions on Air Power, Air Force History and Museum Programme, Washington DC, 1994, Proposition I.
- Fazal Muqueem Khan, Pakistan's Crisis in Leadership (National Book Foundation, 9. Islamabad, 1973), p. 241.
- 10. Doctrine, n. 6, pp. 51, 55.
- 11. SN Prasad, The India-Pakistan War of 1971: A History, History Division, MOD, New Delhi, 1992, p. 614. ROUGH VISION
- 12. Ibid., p. 450.
- 13. Singh, n. 1, p. 146.
- 14. Doctrine, n. 6, p. 54.
- 15. Peter A. Costello, A Matter of Trust: Close Air Support Apportionment and Allocation for Operational Level Effects (Air University Press, 1997). JSTOR, http://www.jstor.org/ stable/resrep13804
- 16. Ibid.
- 17. Harbaksh Singh, War Despatches: Indo-Pak Conflict 1965 (Lancer International, New Delhi), p. 196.
- 18. Lal, n. 4, p. 323.
- 19. Ibid.
- 20. AK Tiwary, IAF and its Wars (Lancer, Delhi, 2012), p. 245.

- 21. K V Krishna Rao, *Prepare or Perish, A Study of National Security* (Lancer Publishers Pvt Ltd, New Delhi, 1991), p. 249.
- 22. Diptendu Choudhury, *Air Defence is Everywhere*, VIF, July 24, 2020, at https://www. vifindia.org/article/2020/july/24/air-defence-is-everywhere
- Diptendu Choudhury, Security Vision 2047: A Hundred Years since Independence, VIF, November 4, 2022, p. 28, at https://www.vifindia.org/paper/2022/november/04/ security-vision-2047-a-hundred-years-since-independence.
- 24. Arvind Gupta, *Significance of Exercise 'Gagan Shakti-2018'*, VIF, May 27, 2018, at https://www.vifindia.org/article/2018/may/07/significance-of-exercise-gagan-shakti-2018.
- 25. Rezaul H Laskar, "China Bolstering Tibet Military Infrastructure", *Hindustan Times*, February 8, 2021, at https://www.hindustantimes.com/india-news/china-bolstering-tibet-military-infrastructure-101612808993838.html
- 26. MS Pratibha, "PLA Western Theatre Command Lays Stress on Joint Operations Capabilities", MPIDSA Issue Brief, November 2, 2022, at https://www.idsa.in/ issuebrief/PLA-Western-Theatre-Command-msprathibha-021122
- 27. Ravinder Singh Chatwal, "Enter the PLA Rocket Force: Assessing China's Missile Capabilities", *Air Power Journal* Vol. 11, No. 3, Monsoon 2016 (July-September).
- Prakash Menon, "Army's Most Potent Weapon Against China on Indian borders—Human Force", The Print, January 17, 2023, at https://theprint.in/opinion/armys-most-potentweapon-against-china-on-indian-borders-human-force/1317146/.
- 29. Anil Chopra, "Xinjiang Military Region: Air Assets to Monitor", CAPS Issue Brief 137/21, June 16, 2021, at https://capsindia.org/xinjiang-military-region-air-assets-to-monitor/.
- 30. Ibid.
- 31. The Wire, at https://thewire.in/security/delay-in-,creation-of-theatre-commands-formilitary-report.