

Transformation of the Indian Air Force for Future-Ready Joint Operations

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Abstract

This essay explores the strategic transformation of the Indian Air Force (IAF) into a future-ready force capable of executing seamless joint operations across air, land, sea, space, and cyber domains. This evolution is driven by shifting geopolitical dynamics, emerging non-traditional threats, and rapid technological advancements. The IAF aims to enhance jointness with other military services, strengthen multi-domain capabilities, and adopt cutting-edge technologies such as artificial intelligence, unmanned aerial vehicles, and 5th generation fighters. Key focus areas include modernisation of airbases, improved command and control systems, integration of space and cyber domains, and human capital development through advanced training and leadership programs. The transformation also addresses interoperability challenges, cybersecurity threats, and the need for cost-effective modernisation. By fostering innovation and unity, the IAF aspires to bolster India's strategic deterrence, operational flexibility, and global defence posture in an increasingly complex security environment.

Introduction

The Indian Air Force (IAF), a cornerstone of India's military power, is undergoing a pivotal transformation to meet the demands of modern warfare. As technological advancements and

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This is the First Prize winning entry of the USI-Chief of Air Staff Essay Competition.

Journal of the United Service Institution of India, Vol. CLV, No. 641, July-September 2025.

geopolitical complexities redefine the contours of global conflict, the IAF's evolution into a future-ready force is not just an aspiration but an imperative.¹ Central to this transformation is the goal of achieving seamless integration across land, sea, air, space, and cyber domains, enabling joint operations that enhance India's strategic edge. The need for inter-service cooperation, technological advancement, and operational flexibility has never been greater, as threats become more complex and multifaceted. The IAF's preparedness for future joint operations will be central to India's strategic defence outlook and ability to maintain air superiority in a rapidly changing global security environment.²

Objectives

The transformation of the IAF has three overarching objectives:

- **Enhancing Holistic Joint Operations.** As warfare becomes increasingly complex and multi-dimensional, the importance of joint operations and co-ordinated efforts between the IAF, Indian Army, Indian Navy, and other defence arms cannot be overstated.³ This involves refining Command and Control (C2) systems, standardising procedures across different services, and promoting interoperability between air, land, and sea forces. Furthermore, these endeavours also extend to fostering interoperability with international military forces. This collaborative approach will ensure agility and adaptability in a dynamic and volatile geopolitical landscape, allowing for rapid responses to emerging global security challenges, joint training exercises, and the sharing of intelligence and resources across borders. Strengthening these international partnerships will significantly enhance operational readiness and global strategic positioning—ensuring a robust and unified defence posture on the international stage.
- **Strengthening Multi-Domain Capabilities.** The evolving nature of warfare, especially in the context of hybrid and non-traditional threats, demands that the IAF strengthen its capabilities across multiple domains like air, space, cyber, and even the electromagnetic spectrum. This involves the integration of assets and forces across these varied dimensions to provide enhanced flexibility and strategic depth.

- **Future-Proofing National Defence.** As geopolitical dynamics evolve and new threats emerge, future-proofing national defence is crucial for maintaining strategic deterrence and operational readiness. For the IAF, this entails adopting cutting-edge technologies, such as Artificial Intelligence (AI), Unmanned Aerial Vehicles (UAVs), and next-generation fighter aircraft like the 5th generation stealth fighters. Futureproofing also includes modernising airbases, upgrading weaponry, and ensuring sustainability in defence capabilities.

Changing Geopolitical and Security Environment

The shift in global power dynamics, emerging threats, and evolving alliances significantly impact India's defence strategy, necessitating the adaptation of its military forces to ensure national security and regional stability as under:

- **Shifting Global Power Dynamics.** The rise of China as a military and economic superpower and the ongoing competition between major global powers such as the United States, Russia, and China are altering the global security landscape. China's growing military assertiveness in the Indo-Pacific, coupled with its advancements in technologies like hypersonic weapons and cyber warfare, presents a unique challenge to India's security. The IAF must adapt by not only enhancing its deterrence capabilities but also strengthening regional alliances.
- **Regional Instability and Border Security.** India's geographical position, surrounded by both stable and unstable regions, demands a dynamic approach to its security. The ongoing tensions with neighbouring countries, such as Pakistan and China, require the IAF to maintain high levels of readiness and to adapt its air defence strategies. The unresolved territorial disputes in regions like Kashmir continue to be flashpoints, necessitating advanced surveillance, reconnaissance, and rapid-response capabilities.
- **Asymmetric and Non-Traditional Threats.** The changing security environment is also characterised by the rise of non-traditional threats such as terrorism, cyberattacks, and hybrid warfare. These threats often transcend traditional military domains, requiring the IAF to enhance its capabilities in both cyber defence and Electronic Warfare (EW).

- **New Domains of Warfare:** The technological revolution in areas such as AI, robotics, and space has introduced new dimensions to warfare. Space is a vital domain that has become increasingly contested, with adversaries developing capabilities to disrupt or destroy satellites critical for communication, navigation, and intelligence.

Need for Jointness

The concept of jointness involves the integration and coordination of all branches of the military to achieve a unified operational approach, enhancing overall efficiency, effectiveness, and strategic impact as given below:

- **Synergy and Operational Efficiency.** Jointness allows the Indian Armed Forces to leverage the unique strengths of each service. The IAF, with its air superiority, can provide crucial Intelligence, Surveillance, and Reconnaissance (ISR) capabilities, along with strategic bombing and close air support. The army, with its ground-based operations, and the navy, with its maritime capabilities, can benefit from this support in real-time combat scenarios.
- **Improved Interoperability.** The integration of platforms allows for better coordination and communication. With the increasing reliance on technology, a joint approach ensures that all services can operate in tandem, even when using different technologies. This interoperability is crucial not only in real-time combat situations but also during peacekeeping operations, humanitarian missions, or natural disaster response, where multiple military services might be involved.⁵
- **Cost-Effective Resource Utilisation.** Jointness allows the Indian Armed Forces to make more efficient use of resources by combining assets such as transport aircraft, reconnaissance systems, and logistics networks. The IAF, for instance, can assist the army by deploying forces to remote or inaccessible regions, while the navy can provide maritime security or evacuate personnel during crises. By sharing these assets across services, the military can reduce redundancies and ensure that resources are deployed most strategically and cost-effectively.

- **Strategic Decision-Making and Political Objectives.** Jointness ensures that the military's strategic decision-making aligns with national political objectives. By establishing a unified military command structure, political leaders can have a clearer understanding of military capabilities and limitations, leading to more coherent defence policies and quicker decision-making during crises.

Key Drivers for Transformation

The following key drivers are central to the IAF's transformation:

- **Evolving Geopolitical and Security Landscape.** As India faces increasingly complex regional security challenges, the need for a modern and responsive military force becomes more urgent. The rise of China as a strategic competitor, coupled with ongoing tensions with Pakistan, necessitates a transformation in how India's air power is utilised. The need to secure India's borders and maritime interests in an era of strategic ambiguity drives the push for a more adaptable and technologically advanced air force.
- **Advancements in Military Technology.** The rapid development of new technologies such as stealth aircraft, drones, AI, cyber capabilities, hypersonic weapons, and unmanned aerial systems demands that the IAF continually evolve its operational doctrines and adopt these technologies to stay ahead of potential adversaries.
- **Integration of Multi-Domain Operations.** Modern warfare is multi-domain, extending beyond air and ground forces to include space, cyber, and the electromagnetic spectrum. The IAF must evolve to operate seamlessly across all these domains.
- **Resource and Budgetary Considerations.** The IAF must balance the need for modernisation with the resources available, driving efforts to prioritise cost-effective yet high-impact upgrades. Investments in indigenous defence technologies, such as the development of advanced fighter aircraft under the 'Make in India' initiative, reflect a strategic push to reduce dependency on foreign defence suppliers and increase self-reliance in defence production.

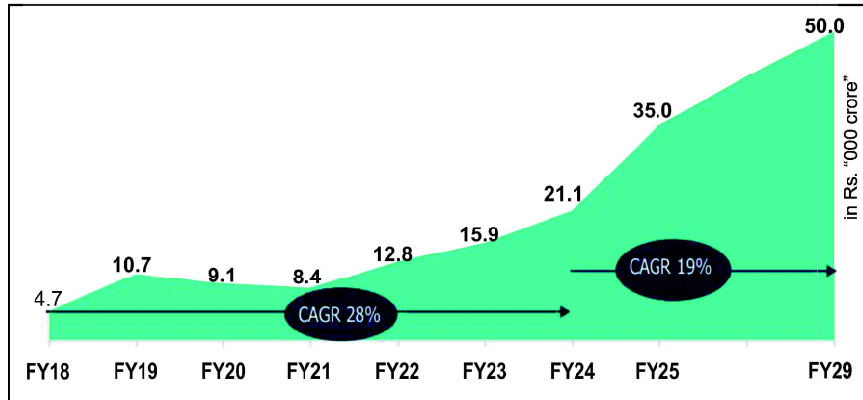
Indian Defence Exports to grow at a CAGR of about 19% during next 5 years

Figure 1: Indian Defence Exports to Grow at a CAGR of about 19 per cent during next five years

Source: Department of Defence Production, Press Information Bureau, and CareEdge Ratings

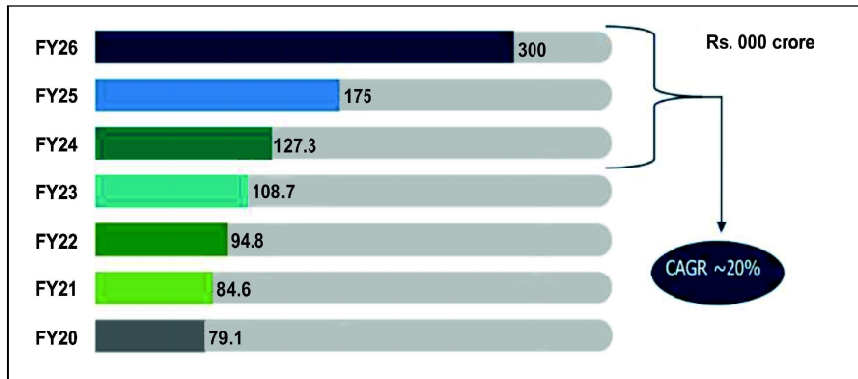
India's defence production set to grow at a CAGR of around 20% during FY24-FY29

Figure 2: India's defence production set to grow at a CAGR of around 20 per cent during FY24-FY29

Source: Department of Defence Production, Press Information Bureau, and CareEdge Ratings

Operational and Capability Transformation

The IAF is undergoing a comprehensive transformation driven by the need to address emerging security challenges, evolving technologies, and shifting towards multi-domain warfare. These focus on:

- **Enhanced Air Combat and Operational Flexibility.** Increasing the flexibility, speed, and precision of its air operations. Modern air combat requires adaptability in response to a wide range of scenarios, from conventional warfare to asymmetric threats. This transformation involves:
 - **Multi-Role Aircraft.** The IAF is upgrading its fleet with multi-role aircraft to increase versatility and combat readiness. These aircraft can perform a variety of roles like air superiority, ground attack, reconnaissance, and precision strikes, all while maintaining a high level of survivability in contested airspace.
 - **5th Generation Fighters.** IAF is focused on developing and inducting 5th generation stealth fighters (e.g., the indigenous Advanced Medium Combat Aircraft), which will give the force an edge in air superiority and countering emerging threats like advanced enemy air defences and stealth aircraft.⁸
 - **High-Speed Precision Strikes.** The IAF is integrating precision-guided munitions, such as laser-guided bombs and cruise missiles, to enhance strike capabilities with minimal collateral damage.
- **Strengthening Multi-Domain Warfare Capabilities.**
 - **Space and Satellite Capabilities.** The IAF is focusing on integrating space capabilities for surveillance, communications, and navigation. Space-based assets play a crucial role in intelligence gathering, missile warning, and satellite-based communication.
 - **Cyber Warfare and EW.** The integration of cyber and EW capabilities is a key aspect of operational transformation. The IAF is building specialised units for the cyber defence to protect critical air defence infrastructure and aircraft systems from cyberattacks. Additionally, the IAF is expanding its EW capabilities to neutralise enemy radar, communication systems, and missiles, ensuring air superiority in hostile environments.
- **Advancements in Surveillance, Intelligence, and C2.** One of the key elements in the transformation of the IAF is its shift towards improving situational awareness, surveillance,

and C2 systems. The ability to operate effectively in complex, fast-evolving situations is crucial, and modernising the IAF's C2 and ISR capabilities is essential for future operations.

- **Modernisation of Airbases and Logistics Support.**

The ability to rapidly deploy and sustain air operations is a vital aspect of the IAF's transformation. Modernising airbases, improving logistics networks, and developing rapid deployment capabilities are critical for operational readiness as given below:

- **Strategic Airbases and Infrastructure.** The IAF is modernising and constructing new airbases with improved infrastructure to support advanced aircraft and provide greater operational flexibility, particularly in border areas or areas of high conflict.
- **Logistics and Maintenance Transformation.** The IAF is modernising its logistics and maintenance frameworks to ensure faster turnaround times and greater operational availability of aircraft. The introduction of new technologies in aircraft maintenance, such as predictive maintenance systems powered by AI, allows for proactive management of aircraft performance, and reduces downtime.
- **Rapid Deployment Capabilities.** Strategic airlift capabilities, including the induction of advanced transport aircraft like the C-130J Super Hercules, allow the IAF to rapidly move troops, equipment, and supplies to any part of India or its neighbouring regions in times of crisis.

Human Capital Development

To remain agile, effective, and future-ready, the IAF is focusing on the continuous professional development and well-being of its personnel as under:

- **Training and Education.** With the rapid advancements in technology and the increasing complexity of multi-domain warfare, IAF personnel need to be well-prepared to operate a variety of advanced systems.
- **Advanced Pilot Training.** The IAF has established world-class pilot training programs to ensure that its pilots are equipped to operate the latest aircraft, including multi-role fighters, UAVs, and advanced transport aircraft.

- **Simulation-Based Training.** The IAF is increasingly relying on simulators and virtual environments for training. This allows for realistic, low-cost, and high-frequency training, where personnel can experience combat scenarios, practice coordination with other services, and familiarise themselves with new technologies and operational systems.
- **Leadership Development.** Strong leadership is essential for maintaining operational readiness and executing complex, high-stakes missions.
- **Specialised Skill Development.** As warfare becomes increasingly technological and multifaceted, specialised skills are crucial for ensuring that personnel are equipped to handle the complexities of modern military operations.
- **Diversity and Inclusion.** A modern and progressive military force must reflect the society it serves. The IAF is committed to promoting diversity and inclusion by recruiting and training personnel from diverse backgrounds, including women and marginalised communities.

Space and Cyber Domain Integration

The IAF, acknowledging the significance of these domains in modern warfare, is working on an integrated approach to leverage space and cyber capabilities alongside its traditional air combat role as under:

- **Space Domain Integration.** The IAF recognises that integrating Space assets into its operational framework is vital for modern defence strategies.
 - **Surveillance and Reconnaissance.** Space-based surveillance platforms like satellites provide real-time ISR, which are crucial for monitoring adversary movements and gathering vital intelligence.
 - **Communication Networks.** Space-based communication systems ensure secure and uninterrupted communication channels, even in remote or contested areas. The seamless flow of information between various units, including aircraft, ground forces, and other military services, is enabled by space communication networks.

- **Space-Based Early Warning Systems.** The integration of space systems into air defence operations includes the development of space-based early warning systems to detect missile launches and other potential threats. These systems allow for timely warnings and enable defensive measures such as intercepting incoming threats before they reach their target.
- **Cyber Domain Integration.** As digital technologies increasingly influence military operations, the cyber domain has become a key area of concern. The ability to protect, defend, and even attack through cyberspace is essential for the IAF to maintain superiority.
 - **Cyber Defence of Air Systems.** The IAF must defend its cyber infrastructure including aircraft communication systems, radar, and C2 centres from cyberattacks that could disrupt operations.¹⁰
 - **Offensive Cyber Capabilities.** The IAF is also developing offensive cyber capabilities that can be used to disrupt the adversary's C2 systems, communication networks, and sensor systems. This allows the IAF to neutralise enemy systems without having to rely on traditional kinetic strikes, making cyber capabilities a force multiplier in modern warfare.
 - **EW.** This is an essential component in the modern battlespace, allowing the IAF to gain an advantage by blinding enemy systems, disrupting C2, and protecting its assets from similar attacks.

The integration of space and cyber domains is a key strategy in modern warfare, and the IAF is working to create a seamless synergy between the two domains to enhance operational effectiveness.

Challenges in Transformation

The transformation of the IAF into a future-ready, multi-domain, joint force is an ambitious and complex process. While the IAF has made significant strides in modernising its technology, enhancing jointness with other services, and adapting to new domains such as space and cyber, the journey is not without its

challenges such as:

- **Technological and Operational Challenges.**
 - **Integration of Advanced Technologies.** While newer technologies like 5th generation fighter jets, drones, and space-based surveillance systems promise enhanced capabilities, they require a substantial overhaul of training programs, maintenance procedures, and operational doctrines.
 - **Interoperability of Modern and Legacy Systems.** The IAF's modernisation efforts involve upgrading its existing fleet of aircraft and equipment while introducing cutting-edge technologies. However, this creates challenges in ensuring the interoperability of modern platforms with older systems. Bridging this gap is essential for maintaining the IAF's operational efficiency during the transformation phase.
 - **Cybersecurity and Space Vulnerabilities.** Space assets like satellites and communication systems are highly vulnerable to cyberattacks, jamming, and other forms of disruption. Similarly, the increasing reliance on cyberspace for operational control and communications makes the IAF's cyber infrastructure a potential target for adversaries.
- **Resource Constraints.**
 - **Financial Limitations.** With limited defence budgets, allocating sufficient resources for the transformation process while maintaining existing operations is a difficult balancing act. Moreover, the high costs associated with acquiring state-of-the-art equipment can strain the budget, leading to delays or the scaling back of some projects.
 - **Procurement Delays and Bureaucratic Hurdles.** Procurement is often delayed due to bureaucratic hurdles, lengthy decision-making processes, and challenges in negotiating with foreign suppliers.¹¹ These delays can affect the timely induction of critical technologies.

- **Organisational and Structural Challenges.**

- **Cultural Shift Towards Jointness.** The transformation of the IAF into a more joint and integrated force with the army and navy requires a cultural shift towards greater collaboration and cooperation. Historically, the IAF has operated as an independent service, and fostering a joint operational mindset among personnel is a significant challenge.

- **Adapting to Multi-Domain Warfare.** Adapting to multi-domain operations requires a major shift in how the IAF plans, executes, and coordinates missions. The challenge lies in developing a robust and agile C2 system that can handle the complexities of multi-domain battlespaces.

- **Resistance to Change.** Like any large organisation, the IAF faces some resistance to change, particularly among senior personnel who may be accustomed to traditional methods and systems. Adapting to new technologies, doctrines, and organisational structures can be met with scepticism or reluctance, which can slow down the pace of transformation.

- **Strategic and Geopolitical Challenges.**

- **Emerging and Evolving Threats.** Adversaries are rapidly advancing their technological capabilities, especially in areas like hypersonic missiles, stealth aircraft, and space warfare, creating a constant need for the IAF to stay ahead in terms of innovation and capability development. The challenge lies in predicting future threats and ensuring that the IAF's transformation is forward-looking, adaptable, and capable of countering emerging technologies and tactics.

- **Strategic Autonomy and Indigenisation.** The IAF is focusing on achieving greater self-reliance through initiatives like 'Make in India'. While domestic defence manufacturers are making progress, the IAF remains dependent on foreign suppliers for certain high-end technologies. This reliance could pose strategic risks, particularly in the event of a crisis that disrupts supply chains or diplomatic relations.

- **Policy and Regulatory Challenges.**

- **Regulatory and Legal Issues.** The transformation of the IAF also involves navigating complex regulatory and legal frameworks. The procurement of advanced defence technologies often involves navigating export control laws, intellectual property concerns, and international regulations. These legal barriers can slow down the pace of modernisation and complicate collaboration with international defence partners.

- **Adapting to Changing Defence Doctrines.** The IAF's transformation is also tied to the evolution of India's broader defence doctrine. As national security priorities shift in response to new threats and strategic partnerships, the IAF must continuously adapt its strategies, training, and capabilities. The challenge lies in aligning the IAF's transformation with national defence policies while maintaining flexibility to respond to unforeseen circumstances.

Implementation Roadmap

The implementation roadmap as projected here outlines key steps to achieve the IAF's vision of modernisation, integration, and operational readiness. This roadmap will span multiple years and requires sustained efforts in technological advancement, human resource development, strategic planning, and inter-service coordination.

Phase 1: Foundation Laying (Short-Term Goals—1 to 3 Years).

This phase focuses on short-term objectives like organisational restructuring, technological upgrades, and initial integration efforts.

- **Strategic Planning and Policy Development.¹²**

- Establish the 'IAF Transformation Steering Committee' to guide and oversee the process of transformation.

- Develop a comprehensive long-term modernisation and multi-domain integration strategy aligning with national defence policies and strategic objectives.

- **Technological Upgradation.**
 - Procurement of advanced air assets.
 - Upgradation of existing platforms for enhanced capabilities and integration with advanced systems.
 - Laying a standard operating system to assess advancement requisites.
- **Cyber and Space Initiatives.**
 - Establish a dedicated 'IAF Cyber and Space Command'.
 - Develop space-based ISR capabilities, focusing on satellite communication, reconnaissance, and navigation.
- **Training and Human Capital Development.**
 - Revamp training curricula at the Air Force Academy and other institutes to include multi-domain operations, focusing on space, cyber, and joint operations.
 - Begin specialised training programs for emerging roles, including cyber defence experts, space operators, and drone operators.
- **Jointness and Inter-Service Coordination.**
 - Establish joint operational commands to facilitate coordinated, multi-service operations.
 - Initiate joint training exercises involving all three branches, with a focus on interoperability and understanding the operational roles of each service in a joint environment.

Phase 2: Expansion and Integration (Medium-Term Goals—3 to 7 Years). Focus on expanding technological capabilities, enhancing joint operational structures, and further integrating space and cyber domains into IAF operations.

- **Advanced Technological Integration.**
 - Integrate 5th generation fighter jets, advanced drones, and unmanned systems for surveillance, reconnaissance, and precision strikes.

- Deploy space-based early warning and missile defence systems.
- **Cyber and Space Infrastructure Development.**
 - Strengthen cyber warfare capabilities with offensive and defensive cyber operations units designed to target adversaries' C2, Communications, Computers, and ISR systems.
 - Expand the space surveillance and reconnaissance network to ensure 24/7 operational capability for tracking threats and gathering intelligence.
- **Enhanced Multi-Domain Operations.**
 - Develop multi-domain operations centres to coordinate and control operations across air, space, cyber, and land domains.
 - Implement real-time data sharing and communication protocols.
 - Begin the development of AI-driven C2 systems.
- **Human Capital Growth.**
 - Expand specialised training in emerging areas like AI, space, and cyber.
 - Collaboration with international defence organisations.

Phase 3: Full-Scale Integration and Force Modernisation (Long-Term Goals—7 to 15 Years). Focus on achieving full operational integration, and complete modernisation.

- **Achieving Full Technological Integration.**
 - With the indigenous development of fighter jets like Ligh Combat Aircraft and its advanced versions.
 - Integration of AI, machine learning, and data analytics into mission planning, targeting, and operational decision-making processes.
 - Integration of space assets, including high-resolution surveillance satellites and communication relays, for round-the-clock operational support.

- **Strengthening Jointness and Multi-Domain Warfare.**
 - Ensure that all IAF units are capable of operating in joint, multi-domain scenarios by regularly participating in joint force exercises.
 - Operationalise multi-domain battle networks that integrate all assets into a unified operational structure that can rapidly adapt to evolving threats.
 - Establishment of permanent joint headquarters.
- **Cyber Resilience and Space Security.**
 - Implement cyber resilience across all critical operational systems.
 - Strengthen space security measures, including the development of anti-satellite capabilities, to deter adversaries from targeting India's space assets.
- **Sustainment and Innovation in Human Capital.**
 - Establish a continuous learning culture within the IAF, ensuring that personnel are always updated on the latest developments in technology and tactics.
 - Create a robust talent retention strategy that ensures the IAF retains its top performers and maintains a high level of expertise in emerging domains.
- **Global Collaboration and Strategic Partnerships.**
 - Strengthen strategic defence partnerships with key global powers, enhancing interoperability, and knowledge exchange.
 - Expand participation in international defence initiatives and peacekeeping missions to showcase IAF capabilities in real-world scenarios.

Phase 4: Review and Adaptation (Ongoing—15+ Years). As the transformation reaches its full scale, the IAF will enter a phase of continuous evaluation, adaptation, and innovation to stay ahead of emerging threats and technological advancements.

- **Continuous Technological Refreshment.**
 - Regularly update the IAF's technological assets, including aircraft, drones, cyber-infrastructure, and space

systems, to keep pace with rapidly evolving technology and tactics.

- Constantly reassess national security threats and adjust the IAF's operational strategies and capabilities accordingly.
- Invest in future technologies, such as quantum computing, directed energy weapons, and autonomous systems, to ensure that the IAF remains technologically superior.
- **Feedback and Lessons Learned.** Implement a feedback loop that gathers insights from joint exercises, combat missions, and peacekeeping deployments to refine operational concepts, training programs, and organisational structures.

Conclusion

The transformation of the IAF into a future-ready, multi-domain, joint force is crucial for maintaining national security and strategic dominance in an increasingly complex and dynamic global environment. As threats evolve and the nature of warfare shifts towards integrated, technology-driven, multi-domain operations, the IAF must adapt by embracing new technologies, enhancing joint operational capabilities, and fostering synergy between the air, space, cyber, and land domains. However, this transformation journey is not without its challenges. Overcoming technological integration hurdles, addressing resource constraints, fostering a culture of jointness, and adapting to rapidly changing geopolitical dynamics require sustained efforts and strategic foresight. The IAF will need to navigate these challenges through strong leadership, continuous innovation, and effective policy and defence strategies.

Endnotes

¹ Anil K. Khosla, *India's Air Power: Defining the Vision* (New Delhi: Atlantic Publishers, 2016).

² RK Gupta, *The Indian Armed Forces: A History of the Air Force* (New Delhi: Knowledge World, 2014).

³ The IAF's participation in multinational exercises, such as Exercise Tarang Shakti, underscores its commitment to fostering interoperability and strengthening partnerships with allied nations. These efforts position

the IAF as a formidable force capable of executing complex joint operations in an increasingly dynamic and challenging security environment, accessed 28 Mar 2025, https://en.wikipedia.org/wiki/Exercise_Tarang_Shakti

⁵ The IAF's participation in multinational exercises, such as Exercise Tarang Shakti, underscores its commitment to fostering interoperability and strengthening partnerships with allied nations. These efforts position the IAF as a formidable force capable of executing complex joint operations in an increasingly dynamic and challenging security environment, , accessed 28 Mar 2025, 2025.<https://en.wikipedia.org/wiki/Akashteer>

⁸ Institute for Defence Studies and Analyses (IDSA), "Transformation of the Indian Air Force," IDSA Issue Brief, accessed 20 Mar 2025, https://www.idsa.in/system/files/IB_TransformationoftheIAF.pdf

¹⁰ Ministry of Electronics and Information Technology, Government of India, "National Cyber Security Policy 2020" (New Delhi: Ministry of Electronics and Information Technology, 2020), accessed 25 Mar 2025, <https://www.dsci.in/files/content/knowledge-centre/2023/National-Cyber-Security-Strategy-2020-DSCI-submission.pdf>

¹¹ Ministry of Defence, Government of India, Defence Acquisition Procedure (DAP) 2030, accessed 25 Mar 2025, <https://www.mod.gov.in/dod/sites/default/files/DAP2030new.pdf>

¹² Smruti Deshpande, "How IAF, Army Are Moving Towards Jointness with Integration of Air Defence Systems," ThePrint, 15 January 2025, accessed 28 Mar 2025, <https://theprint.in/defence/how-iaf-army-are-moving-towards-jointness-with-integration-of-air-defence-systems/>; "Indian Air Force Aims to Have a 1000 Combat Jet Fleet by 2047," Indian Defence Research Wing (IDRW), 13 March 2025, accessed 28 Apr 2025, <https://idrw.org/indian-air-force-aims-to-have-a-1000-combat-jet-fleet-by-2047/>

