



Evolving Warfare and Need for India's Defence Transformation

For Prelims: [Chief of Defence Staff](#), [Quantum computing](#), [Make in India](#), [Advanced Towed Artillery Gun System](#), [SRIJAN portal](#), [Defence Research and Development Organisation](#)

For Mains: India's Defence Modernization and Indigenous Capabilities, 21st Century Warfare

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Why in News?

At **Aero India 2025**, [Chief of Defence Staff \(CDS\) General Anil Chauhan](#) emphasized the need for the Indian Army to evolve to adapt the **emerging warfare trends**, stressing the importance of **holistic transformation beyond technological advancement**.

Aero India

- Aero India, organized by the **Defence Exhibition Organisation**, Ministry of Defence, is India's premier **biennial aerospace and Defence exhibition** held at **Yelahanka Air Force Station, Bengaluru**.
 - Aero India features global aero vendors and aerobatic displays by the Indian Air Force, it was first held in 1996.

How is Warfare Evolving in the 21st Century?

- **Multi-Dimensional Conflicts:** Warfare now extends beyond **land, sea, and air** to **cyberspace, the [electromagnetic spectrum](#), and outer space**.
 - The emergence of **unmanned platforms** and **autonomous weapons** is redefining battlefield engagements.
- **Rise of Non-Contact Warfare:** **Precision-guided munitions, cyberattacks, and electronic warfare (EW)** have reduced direct combat engagements.
 - The use of **long-range missiles, [drones](#), and AI-powered systems** allows adversaries to strike without direct confrontation.
- **Technologies in Warfare:** The US, China, and Russia are at the forefront of advancing [Quantum computing](#), [Artificial intelligence \(AI\)](#), and hypersonic weapons that are transforming war strategies and are set to redefine combat scenarios, potentially leading to **machine-vs-machine warfare**.
 - Additionally, **sixth-generation fighter jets** and autonomous weapons systems are expected to play a crucial role in future battles.
 - However, the exact impact of these technologies **remains uncertain, necessitating**

adaptable military strategies.

- **Perpetual and Irrational Wars:** Earlier, wars were **finite** with political negotiations following combat.
 - Today, conflicts have become **prolonged, hybrid in nature** (involving a mix of conventional warfare, cyber operations, and information warfare), **and driven by technological asymmetry** (uneven distribution of technological capabilities between different countries).

Why Does the Indian Defence Need a Holistic Transformation?

- **Evolving Security Challenges:** India faces a **two-front threat** from **China and Pakistan**, with persistent border tensions (e.g., **Eastern Ladakh, Doklam**) and **Pakistan's proxy war in Jammu & Kashmir**.
 - Their strategic collaboration, including **China Pakistan Economic Corridor (CPEC)**, raises the risk of a collusive two-front war.
 - China's growing presence in the **Indian Ocean** requires India to strengthen its maritime power and **out-of-area contingency (OOAC) operations**.
- **Structural and Doctrinal Limitations:** India's Defence faces structural challenges, including the **Indian Army's dominance in Defence planning** and a **large standing force of over 1.4 million**, straining the budget and hindering modernization.
 - India's doctrinal limitations, marked by reactive responses to threats (e.g., **Kargil War, Mumbai 26/11**), highlight the need for **proactive deterrence** and updated operational doctrines for enhanced security.
- **Modernization Deficiencies:** India's **Defence inventory is outdated**, affecting operational efficiency. The **Indian Army still uses T-72 tanks (over 40 years old)** and Bofors howitzers from the 1980s, despite modern advancements.
 - Despite the **'Make in India' initiative**, India remains the **world's largest arms importer** (9.8% of global imports from 2019 to 2023), relying on **Russia, France, and the U.S. for advanced weaponry**.
 - This is due to delays in **modern equipment induction**, such as **Tejas fighters and Future Infantry Combat Vehicles**.
 - Lack of synergy between the **Indian Army, Air Force, and Navy** hinders **integrated air-land-sea warfare** and expeditionary strategies.
- **Budgetary Constraints:** India's 2025-26 Defence budget is **USD 78.7 billion, very less compared to China's USD 236 billion in 2023**.
 - Since 2001, India's Defence sector has attracted only Rs 5,077 crore in **Foreign Direct Investment (FDI)**, despite the FDI limit being raised to **74% via the Automatic Route and up to 100% through the Government Route**.
 - **Manpower costs (salaries and pensions)** consume a large portion of the Defence budget, leaving little for capital acquisitions. Balancing Defence needs with financial constraints remains a challenge for India.

India's Progress in Defence Modernisation

- As part of the Make in India initiative, India has developed major defence systems such as the **Dhanush Artillery Gun System, Advanced Towed Artillery Gun System (ATAGS), Main Battle Tank (MBT) Arjun, Light Combat Aircraft (LCA) Tejas, Fifth-generation (5G) Fighter Aircraft**, submarines, frigates, corvettes, and the recently commissioned **INS Vikrant**, showcasing the nation's growing defence capabilities.
- The **Defence Acquisition Procedure (DAP) 2020** boosted defence production to Rs **1.27 lakh crore in 2023-24**, with a target of Rs 3 lakh crore by 2029, positioning India as a global defence manufacturing hub.
 - India's defence exports soared from **Rs 686 crore in 2013-14 to Rs 21,083 crore in 2023-24**, a 30-fold increase in a decade.
- The industrial licensing process has been streamlined, and the **IDEX scheme** encourages startups and MSMEs to innovate in defence. The **SRIJAN portal aids indigenization ("Make" procedure)**, while Defence Industrial Corridors in **Uttar Pradesh and Tamil Nadu** boost regional manufacturing.

- **Defence R&D is now open to private players** for enhanced collaboration.

What Steps Can India Take to Align with Emerging Warfare Trends?

- **Indigenous Defence Innovation:** Increasing funding for [Defence Research and Development Organisation](#) technology clusters, **private defence startups**, and **academia** to develop cutting-edge military technologies.
- **Technology in Defence:** AI-powered **autonomous drones**, **decision-making systems**, and **cyber warfare tools** need faster integration. **Quantum communication & cryptography** will secure India's strategic military assets.
 - A unified command structure will improve **strategic coordination and operational efficiency**.
- **Cyber and Electromagnetic Warfare Force:** Establishing dedicated **Cyber and Electromagnetic Commands** to counter **digital warfare threats** and expanding [NavIC satellite](#) surveillance and electronic warfare capabilities for a tactical advantage.
- **Military Training and Strategy:** Revising military training to **incorporate AI, robotics, and asymmetric warfare strategies**. Conducting joint military exercises with **global tech-driven armies like the US, Israel, and France**.
- **Enhancing India's Global Defence Standing:** Competing with Western military standards requires **investment in indigenous defence production and innovation**.
 - Aligning with emerging [North Atlantic Treaty Organization \(NATO\)](#) and [QUAD](#) **military doctrines** will help India prepare for global security challenges.
- **Future-Ready Military Strategy:** India's future-ready military strategy should balance **land, sea, air, cyber, and space capabilities**. Leveraging the planned [Bharatiya Antariksha Station \(BAS\)](#) will enhance **space surveillance and communication**.
 - To stay ahead, India must prepare for emerging threats, including **"robot warfare," "drone battles," "autonomous vehicle engagements,"** and **"mechanized clashes."**

Conclusion

India's defence transformation demands a holistic approach, balancing technological advancements with strategic adaptability and aligning with emerging warfare trends, India can enhance its global defence standing and ensure national security.

Drishti Mains Question:

In the era of modern warfare evolving into a multi-domain battle. Discuss the key challenges and necessary reforms for the Indian military to adapt to emerging threats.

UPSC Civil Services Examination, Previous Year Questions (PYQs)

Prelims

Q. What is "Terminal High Altitude Area Defence (THAAD)", sometimes seen in the news? (2018)

- (a) An Israeli radar system
- (b) India's indigenous anti-missile programme
- (c) An American anti-missile system
- (d) A defence collaboration between Japan and South Korea.

Ans: (c)

Q. In the context of the Indian defence, what is 'Dhruv'? (2008)

- (a) Aircraft-carrying warship
- (b) Missile-carrying submarine
- (c) Advanced light helicopter
- (d) Intercontinental ballistic missile

Ans: (c)

Mains

Q. Foreign Direct Investment (FDI) in the defence sector is now set to be liberalized: What influence this is expected to have on Indian defence and economy in the short and long run? (2014)

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