Assessment of India's Indigenous Defence Manufacturing Capabilities

"Operation Sindoor is a powerful symbol of India's courage and a testament of country's commitment to self-reliance"[1]

Prime Minister Narendra Modi
Mann ki Baat, 25 May 2025[2]

Introduction

The success of Operation Sindoor highlighted two significant milestones in India's defence capabilities. First, it showcased the technological prowess and capabilities of indigenously manufactured equipment and second, it laid bare the strategic imperative to enhance defence spending and reduce import dependency. The article seeks to examine India's domestic capabilities and ascertain if critical gaps persist in high-end technology and production infrastructure. India's military capabilities have undergone overwhelming transformation since 2014, metamorphosing from a largely import-dependent military to one focused on self-reliance and domestic production. Under the *Atmanirbhar Bharat* (self-reliant India) initiative, the government further aims to localise production through technology transfer and co-development with foreign partners and align it with its efforts to develop local capabilities across the entire defence manufacturing ecosystem—from design and Research and Development (R&D) to production. The government's initiatives are focused on building a resilient and competitive domestic defence industry that can meet the upcoming security challenges and operational requirements of Indian Armed Forces.[3]

Indigenisation and Strategic Autonomy: The Core of India's Defence Policy

The Government has strongly pursued the indigenisation agenda by boosting the 'Make in India' initiative for defence and by incentivising the private sector and start-ups to work alongside public sector units. It aims to attain cost effectiveness, technological independence, and enhance exports of Indian defence products. Attaining self-sufficiency will safeguard strategic autonomy in critical defence technologies and systems, minimising vulnerabilities arising from external geopolitical factors. Consequent to the government's ascendancies, India's accomplishments include the following:

- **Domestic Production**. India has achieved a record INR 1.27 lakh cr in domestic defence production for Financial Year (FY) 2023-24, with a growth of approximately 174 per cent from INR 46,429 cr in 2014-15. It aims to reach INR 3 lakh cr in defence production by 2029.[4]

- **Defence Exports**. Defence exports have surged from INR 1,941 cr in FY 2014-15 to INR 21,083 cr in FY 2023-24, with a 32.5 per cent growth over the previous fiscal year. India now exports to over 100 nations, including the United States (US), France, and Armenia. India aims to increase defence exports to INR 50,000 cr by 2029 and become a reliable global defence partner.[5]

- **Indigenous Technologies**. India produces cutting-edge equipment such as bulletproof jackets, Dornier aircraft, Chetak helicopters, fast interceptor boats, and lightweight torpedoes. Major defence platforms like Dhanush Artillery Gun System, advanced towed artillery gun system, main battle tank Arjun, Light Combat Aircraft (LCA) Tejas, and Indian Navy Ship (INS) Vikrant have been developed indigenously.

- **Ammunition Production**. India has achieved 88 per cent self-sufficiency in ammunition production, a significant leap from previous years.

Between 2020 and 2024, India remained the world's second-largest arms importer, just behind Ukraine, accounting for 8.3 per cent of global imports. Operation Sindoor has underscored the urgent need to boost India's defence spending from the current 1.9 per cent of gross domestic product to at least 2.5 per cent.[6] The present 26 per cent capital outlay is grossly inadequate, as a significant share is directed towards expensive foreign acquisitions rather than indigenous capability-building.

Russia has continued to be India's primary arms supplier during this period, contributing 36 per cent of total imports, while France and the US together accounted for another 46 per cent. Major defence imports in the recent past include Rafale jets (France), C-17 and C-130J aircraft, Apache and Chinook helicopters (US); and submarines such as the Kilo-class (Russia) and Scorpène-class (France). Other key acquisitions comprised S-400 air defence systems (Russia), Spike missiles (Israel), M777 howitzers (US), Unmanned Aerial Vehicles (UAVs) like Heron and Searcher (Israel) and MQ-9B Predator drones (US).[7] Additionally, India heavily relies on imported engines and advanced avionics for platforms like the Tejas fighter and naval vessels, reflecting a critical gap in indigenous propulsion and electronics capabilities.

Assessment of India's Indigenous Capabilities

Indigenisation is a nation's ability to develop and manufacture defence equipment locally, with the twin goals of achieving self-reliance and reducing dependence on imports. According to the 2025 report by the Stockholm International Peace Research Institute, global military expenditure touched a record USD 2,718 bn last year, marking the third consecutive year when it crossed the USD 2 tn threshold. India continues to be the fourth-largest military spender and the second largest importer of military equipment globally.[8] Despite possessing an extensive defence industrial base,

including Defence Public Sector Undertakings (DPSUs), 52 Defence Research and Development Organisation (DRDO) laboratories[9], and a growing and vibrant private sector, India is yet to achieve significant self-sufficiency in defence production. This is particularly striking, given India's strengths in key sectors such as automotive, aerospace components, shipbuilding, infrastructure, chemicals, and information technology.

India has lagged in building a strong manufacturing industrial base due to several intertwined factors. The country has not been able to fully harness the tremendous potential for technological breakthroughs by its superlative academic institutions. Similarly, despite possessing substantial expertise in metal refining, its headway in advanced metallurgical capabilities has been limited.[10]

India is looking at enhancing its defence imports to INR 50,000 cr by 2030.[11] It is in a remarkable transition stage where it has set up a target of achieving 70 per cent self-reliance by the said time. Current indigenous production hovers around 60 per cent, and is heavily reliant on DPSUs and DRDO-led R&D. The private sector is growing but still restricted in scale. However, critical capability gaps remain in high-performance aircraft engines, advanced avionics, stealth technologies, and complex naval platforms.

- **Government Initiatives**. In pursuit of self-reliance, the government's policies and initiatives have proved to be enablers, cutting red-tapesim and attracting Foreign Direct Investment (FDI). The government has stived to boost *Atmanirbharta* (self-reliance) by enacting policies like Make in India and initiating guidelines to simplify industrial licensing. Key ingenuities like the Defence Acquisition Procedure (DAP) 2020, Defence Production and Export Promotion Policy 2020, and increased FDI limits have stimulated domestic manufacturing. Participation of enterprises like Larsen and Toubro, Tata Advanced Systems, and Bharat Forge in manufacturing advance platforms, artillery guns, drones, and aerospace components has been facilitated by the 'Positive indigenisation list', which mandates procurement of specific equipment only from domestic sources. The ecosystem has also grown substantially because of the enhanced role of start-ups in defence (artificial intelligence [AI], drones, robotics) supported by incubators and innovations for defence excellence. The government has now earmarked 25 per cent of the defence R&D budget for collaboration with private industry, academia, and start-ups, aiming to foster innovation and reduce reliance on foreign technology.[12]

- **Niche Home-Grown Capabilities**. India has made significant strides in developing indigenous defence capabilities across several domains. Key achievements include missile systems like the Agni series, BrahMos[13], and advanced streaming application; aircraft such as the Tejas fighter jet, Advanced Medium Combat Aircraft (AMCA), and twin engine deck based fighter; and naval

assets like INS Arihant, INS Vikrant, and advanced destroyers. In land systems, the Arjun tank and Zorawar light tank represent domestic design efforts, while emerging technologies include laser-based directed energy weapons like DURGA II and KALI.

- **Futuristic Technologies**. India is also investing in futuristic technologies to build next-generation warfare capabilities. Ongoing R&D focuses on AI-driven intelligence, surveillance, and reconnaissance systems, quantum technologies, hypersonic glide vehicles (e.g., BrahMos-II, hypersonic technology demonstrator vehicle), military exoskeletons, cyber warfare tools, and autonomous defence platforms.[14] These initiatives aim to reduce dependency on foreign systems and equip the armed forces with advanced, networked, and high-speed capabilities for modern warfare.[15]

- **Major Weaknesses**. Despite these progressions, India continues to face critical gaps in high-end defence technologies. Indigenous jet engine development (e.g., Kaveri), submarine propulsion, active electronically scanned array radars, electronic warfare systems, long-range missile tech, and advanced UAVs remain areas of weakness. Dependence on imports continues for carrier-based aircraft, military microelectronics, and space-based assets. Bridging these gaps requires continued investment in R&D, stronger private sector involvement, and international collaboration with a focus on technology transfer.[16]

Challenges Hindering Complete Self-Reliance

India's journey towards complete defence self-reliance faces several systemic challenges, particularly in incubating advanced technologies and filling critical capability gaps. Key limitations exist in areas like stealth materials, advanced composites, high-end sensors, next-generation submarines, and directed energy systems. Insufficient investment in R&D further hampers progress in emerging fields such as quantum computing, AI, and hypersonic technologies. While immediate operational needs often necessitate imports, the lack of robust indigenous alternatives in niche domains remains a persistent obstacle.

The defence procurement process is plagued by bureaucratic delays, affecting key projects like Tejas Mk-2, AMCA, and the Kaveri engine. Despite recent reforms under DAP 2020 to reduce procurement timelines, challenges remain. The industrial ecosystem is heavily dominated by DPSUs, with the private sector contributing only 20.8 per cent of defence production in FY 2023–24. A lack of testing infrastructure, weak supply chains for defence-grade materials, and limited fiscal space further impede indigenous development and scalability.[17]

Moreover, India's defence exports still lag in global competitiveness due to issues in product quality, pricing, and inadequate support infrastructure. Concerns

over technology transfer, intellectual property rights, and limited access to global markets, as seen during Operation Sindoor, highlight the vulnerabilities of overdependence on foreign systems.[18]

Overall Evaluation and Way Forward

Critical gaps persist in areas such as jet engine development, stealth technology, electronic warfare, air-independent propulsion-equipped submarines, and long-endurance UAVs. While strategic autonomy depends on control over core technologies, international collaborations are essential in the near term to accelerate capability development, reduce costs, and maintain operational readiness amidst global uncertainties.

To achieve long-term self-sufficiency, India must adopt a phased and a balanced approach combining indigenous capability-building with selective imports and strategic partnerships. This includes prioritising high-impact technologies, such as aero engines, missiles, and advanced electronics, while strengthening the innovation ecosystem through increased R&D funding, greater and enhanced industry-academia collaboration, and start-up engagement. Joint ventures, technology transfer agreements, and offset policies with trusted partners should be leveraged to fill immediate gaps and foster co-development.

Policy and institutional reforms are crucial to maintain momentum. These include simplifying procurement processes, building a robust Tier-1 supplier base, modernising training and education, and developing defence industrial corridors. Export-oriented manufacturing, diversification of procurement sources, and fostering public-private partnerships, especially for programs like AMCA and LCA Mk-II, will help enhance quality, reduce foreign dependence, and position India as a global defence manufacturing hub over the next 10–15 years.

Conclusion

India’s defence manufacturing lacks depth, integration, and technological independence in several critical areas. Addressing these gaps requires long-term commitment, enhanced R&D, global collaborations with tech transfer, and a streamlined ecosystem that encourages innovation and scale. A dual track approach of indigenisation and strategic partnerships is vital to achieve comprehensive self-reliance. Through focused investment, technology partnerships, and sustained indigenisation, India can bridge many of these technology gaps in the coming decade. Though, to become a global defence manufacturing hub, it requires targeted investments, systemic reforms, and technological collaborations.

Endnotes

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Article uploaded on 27-6-2025