India's Quest for Self-Reliance in Defence Sector
Reality Check, Challenges and Way Ahead

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Given the prevalence of numerous security challenges, India's high dependence on other countries for its defence requirements stands out as a serious vulnerability in the national security calculus. In 2024, India was the world's second largest importer of arms, just behind Ukraine, with an 8.3 per cent share of global arms import between 2020 and 2024. This situation can be largely attributed to the absence of a long-term national security strategy due to lack of political direction marked by narrow perspective, absence of indigenous research and pursuit of technology unaligned with military objectives. While India did make attempts to achieve self-reliance, the outcome was not encouraging due to the domination of the public sector entities coupled with bureaucratic gridlocks. To revitalise India's armament industry, the present government, under 'Atmanirbharta/Make in India' programme has initiated slew of defence reforms which include rationalisation of the acquisition and procurement procedures, restructuring of the key bodies and the establishment of Defence Industrial Corridors (DICs). While the Indian defence industry has made significant progress,

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including increase in defence exports, it still has a long way to traverse. The indigenisation achieved so far pertains to low-technology items, while many initiatives remain non-starters. To overcome these challenges, India requires a National Security Strategy, robust ecosystem to scale up the overall industrial capacity, deregulation and initiation of a second round of defence reforms.

Keywords: *Atmanirbharta, Self-reliance, Indigenisation, Defence Industry, Defence Reforms*

Introduction

Over the last few decades, the geopolitical environment has become increasingly complex following tectonic shifts in the international order. India's security concerns have compounded, given its enlarged strategic interests. However, it is ironic that, despite the prevalence of a serious security scenario, India remains highly dependent on other countries to fulfil its defence requirements. In 2024, India was the second largest arms-importing country, just behind Ukraine, with 8.3 per cent of the global share[1] and averaging around US$ 2.5 billion in yearly imports over the last decade.[2]

India's dependence on arms import stands out as a serious lacune in its security calculus due to the vulnerability of supply chains and impingement on its strategic autonomy. The absence of a national security strategy, coupled with constraints of arms procurement in the international markets, has led to adhocism. Stephen Cohen, in his book *Arming Without Aiming-India's Military Modernization*, aptly points out that most of India's weapons for modernisation have been sourced from foreign suppliers due to its failure in indigenous research and development. Further, India's military modernisation has been found to be haphazard, lacking political direction, remaining limited by narrow perspective planning and being driven by the pursuit of technology unaligned with military strategic objectives.[3]

Although India did make varied attempts to achieve self-reliance in its defence requirements from time to time, the outcomes were not very encouraging. Public-sector entities dominate the Indian defence industrial sector, with the Ministry of Defence (MoD) exercising direct control over the Defence Public Sector Undertakings (DPSUs). The Defence Research and Development Organisation (DRDO), established in 1958, has been involved in developing technologies for both conventional and strategic weapon systems. The private sector played a rather limited role before the defence industry was opened up in 2001, being barred before that.

Over the last few years, India's defence procurement policy has undergone significant changes, with reduction in long-standing dependence on Russian weaponry, the imports of which were valued at US$ 60 billion over the past several decades. The strategic shift is marked by the diversification of defence acquisitions and focus on indigenisation. The Indian Prime Minister Narendra Modi's government has made concerted efforts to transform India's arms industry from a net importer to a major exporter of defence equipment. Under the 'Atmanirbhar Bharat Abhiyan' (Self-Reliant India Mission) and 'Make in India' initiatives, the central government has announced several reforms covering various facets of the Indian economy. Specific to the defence economy, the key measures include restructuring of the existing bodies, revising the acquisition process and reviewing industrial regulations and budgetary provisions. Ambitious goals have been set to achieve the defence production target of US$ 360 billion and exports of US$ 60 billion, besides an investment of US$ 6.01 billion to establish two Defence Industrial Corridors (DICs) in the country in future.[4] Given that many of the projects have not achieved the desired progress, these targets would merit a pragmatic review.

There is a host of impediments in India's quest to transition from being a net importer to achieving self-reliance and emerging as a major exporter of arms and equipment. The country's performance so far is a mixed bag and remains sub-optimal. This article undertakes a review of India's quest for self-reliance in the defence industry, assesses the significant challenges and makes salient proposals for the way ahead.

India's Quest for Self-Reliance in Defence

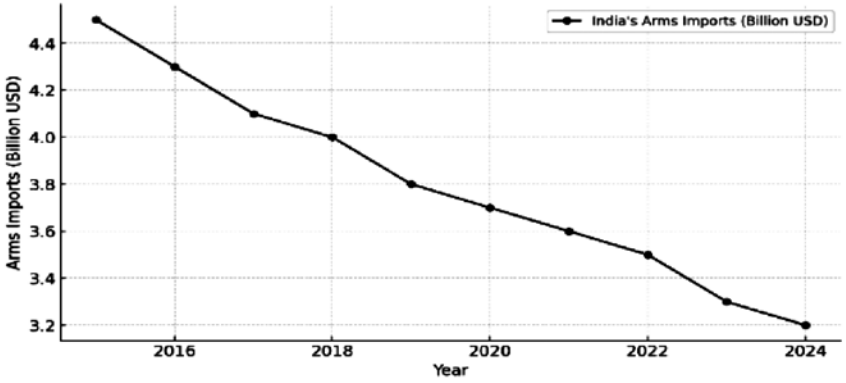
At the time of independence, India possessed a rudimentary defence industrial base that was suited to cater to the needs of the British Indian Army during World War II. Post independence, the Ordnance Factory Board (OFB) was nationalised to oversee defence production, in sync with India's socio-economic model. Hence, India's military–industrial complex was naturally dominated by the public-sector entities. Regrettably, the performance of these establishments remained suspect.

A major drawback was the lack of an overall perspective towards defence manufacturing. The DRDO and Director General Ordnance Factories (DGOF) were assigned the overall responsibility to cater to the country's defence requirements. The OFB's entities were highly inefficient, marred by red tape and bureaucratic culture. While the Army accounted for over

80 per cent of the ordnance factories' orders, with items ranging from arms to mess tiffins, it had no representation on the OFB. The key stakeholder being out of the decision-making loop obviously had an adverse impact on both manufacturing and procurement processes, leading to inordinate delays and substandard products.

India's defence spending has largely hovered around 2 per cent of GDP, with a huge chunk going towards revenue expenditure, leaving just around 26.43 per cent for capital acquisition.[5] Indigenous manufacturing meets barely 30 per cent of the requirements, with the rest being imported, thus making India one of the biggest arms importers in the world. Even the indigenously manufactured defence equipment continues to have a large import component. Around 58 per cent of India's procurement is through license manufacturing.[6] However, over the past decade, India's arms imports have shown a steady decline, as evident from Figure 1.

Figure 1 India's arms imports trend (2015–2024)



Note: The above chart shows the average arms imports by India from 2015 to 2024. The data indicates a general downward trend in arms imports over the last decade, reflecting India's efforts to enhance domestic defence production and reduce dependency on foreign suppliers.

Source: 'Arms Transfers Database', SIPRI, available at https://armstransfers.sipri.org/ArmsTransfer/CSVResult.

Atmanirbharta—Make in India: Key Reforms

To revitalise India's armament production industry and mitigate the risk on account of disruption to critical supply chains, the central government, over

the last few years, has initiated a slew of reforms and taken policy decisions to facilitate investment, technology transfer and ease of doing business. This has resulted in the transformation of the defence ecosystem in many key areas and has given impetus to the process of indigenisation, additionally encouraging local capital procurement and scaling up defence exports. Some of the notable policy reforms undertaken are enumerated in the following sections.

Rationalisation of Acquisition and Procurement Processes

The Defence Acquisition Procedure (DAP) 2020 was instituted to enhance and rationalise the role of the domestic industry in the procurement process. Additionally, it aims to incentivise the foreign Original Equipment Manufacturers (OEMs) to set up manufacturing and maintenance facilities in India. To this end, five procurement categories have been introduced. In first three categories, i.e., (i) Buy Indigenously Designed Developed and Manufactured (IDDM), (ii) Buy Indian and (iii) Buy and Make Indian, the domestic industry has been assigned the primary role of the system integrator. In the contracts awarded under these categories, the overseas companies, as equity partners, will play a secondary role. Category (iv) is Buy Global and Manufacture in India and Category (v) is Buy Global. The maximum foreign direct investment (FDI) varies from 49 per cent in Category (i) to 74 per cent in Categories (ii) to (iv).[7]

One of the key facets of the acquisition reform was proscribing of provision of 50 per cent indigenous content (IC) in the procurement, which includes parts, components, raw material and software. The minimum IC required for the first four prioritised categories as indicated above was pegged at 50 per cent. The MoD also released four Positive Indigenization Lists (PILs) that indicated items that must be procured from domestic manufacturers. The first negative list included 411 items, including sensors, ammunition and field guns, that could be procured exclusively on the 'Make in India' platform.[8] Another list of 928 items was released to include training simulators and weapons on a phased import ban list, eventually to be manufactured exclusively locally.[9] Currently, almost 5,000 items that are being imported by DPSUs figure in these lists. The Srijan Indigenisation Portal (SIP) was launched in 2020. Over 36,384 items currently being imported have been uploaded on the portal.[10] DAP 2020 is set to be revised again towards the end of 2025 to further streamline the acquisition procedure and telescope the time-cycle.

To incentivise the Indian defence R&D sector, traditionally dominated by DRDO, the government launched Innovation for Defence Excellence (iDEX) in 2018.[11] Under this scheme, a prime framework was launched in 2022 to support start-ups with 'grant in aid' up to Rs 10 crores. Allocations under Technology Development Fund (TDF) have been enhanced from Rs 10 crores to Rs 50 crores. The DRDO also launched the 'Dare to Dream' innovation contest to support start-ups and innovations. Furthermore, the 2025–26 Central Budget set aside 0.39 per cent of the total budget for R&D.[12] To boost 'atmanirbharta' in defence and reduce imports by DPSUs, the MoD has released the fifth PIL with 346 items, replacing imports worth Rs 1,048 crore (US$ 126.57 million). The list includes critical components, assemblies and raw materials to enhance self-reliance.[13]

The government had constituted a nine-member Vijay Raghavan Panel to undertake a holistic review of the functioning of the DRDO. The panel, in its report, recommended that the DRDO return to its original goal of focusing on research and development and refrain from productisation, deemed more suitable for the private sector. It also advised the DRDO to narrow down its focus to specific areas.[14] The Department of Defence Science, Technology and Innovation (DDSTI) has been formed under the direct purview of the Prime Minister's Office (PMO) and reporting to the PM.

Restructuring Key Entities

As part of the structural reforms, to enhance functional autonomy and efficiency and unleash new growth potential and innovation, the government took a decision to convert the production units of the OFB. Consequently, of the 16 DPSUs, seven were converted out of erstwhile ordnance factories (OFs) in October 2021. These new defence companies are Munition India Limited (MIL), Armoured Vehicles Nigam Limited (AVNL), Advanced Weapons and Equipment India Limited (AWEIL), Troop Comforts Limited (TCL), Yantra India Limited (YIL), India Optel Limited (IOL) and Glider India Limited (GIL).[15]

Of the remaining nine DPSUs, four—namely Mazagon Dock Shipbuilders Limited, Goa Shipyard Limited, Garden Reach Shipbuilders and Engineers & Hindustan Shipyard Limited—were dedicated to the construction of warships for India's naval forces. The remaining five DPSUs have specific expertise, i.e., Hindustan Aeronautics Limited (HAL): aircraft; Bharat Dynamics Limited (BEL): missiles; Bharat Electronics Limited (BEL): electronics; Bharat Earth Moving Limited (BEML): vehicles and earth-moving equipment; and Mishra Dhatu Nigam (MDN): special alloys.

Cochin Shipyard Ltd (CSL), a PSU, is under the administrative control of the Ministry of Ports and Shipping.[16]

Besides the above key establishments, there are several partnerships between the central government (MoD-controlled establishments) and overseas entities. One of the most successful joint ventures is BrahMos Aerospace between DRDO and its Russian collaborator. The involvement of the private sector has provided a big boost to India's defence production. The government has issued 606 licenses to 369 companies as of April 2023.[17] Some of the key manufacturing initiatives by major private players include C-295 transport aircraft venture between Tata Advanced Systems Limited (TASL) and Airbus; artillery guns between L&T, Tata and Bharat Forge; and Pinaka Rocket Launcher System by Tata and L&T, besides L&T's contract with MoD to manufacture high-powered radars.[18]

Whereas the DPSUs, DRDO and major private companies are pivots of defence production, the Micro, Small and Medium Enterprises (MSMEs) and new ventures lend valuable support as well, as evident from their fast-growing numbers. As of early 2025, India's defence industrial base includes 16 reorganised DPSUs as mentioned earlier, 430 licensed firms and over 16,000 MSMEs, which are actively participating in India's defence manufacturing.[19] In addition, 194 defence tech start-ups are building innovative tech solutions to empower and support the country's defence efforts.[20] The central government has stipulated that a substantial portion of the defence procurement budget should be diverted to the domestic industry. Consequently, since 2020–21, the capital acquisition budget for local procurement has increased from approximately 40 per cent of the total capital procurement budget (Rs 52,000 crores) to around 75 per cent (Rs 99,223 crores) in 2023–24. Private-sector companies contributed nearly Rs 27,000 crore towards defence production in 2023–24.[21]

Establishment of Defence Industrial Corridors

The establishment of two Defence Industrial Corridors (DICs) by the central government, one in Uttar Pradesh (UP) and the other in Tamil Nadu (TN), marks a significant milestone in promoting the nation's indigenous defence manufacturing capabilities. The DIC's 'hub and spoke' model offers 'plug and play' support, infrastructural amenities, connectivity, single-window clearances with simplified procedures and conducive working conditions, while facilitating downstream opportunities for the MSMEs sector. The DICs have attracted an investment of around Rs 8,331 crores as of September

2024; in addition, MoUs for potential investments worth Rs 50,083 crores have been concluded.[22]

Each node is dedicated to a specific product line. The DIC in UP has six nodes: Lucknow (missile and radars), Kanpur (aerospace), Jhansi and Chittarkoot (ammunition, missiles, land systems), Aligarh (drones) and Agra (parachutes). The TN DIC includes Chennai (aerospace), Coimbatore and Hosur (metallurgy, precision engineering components and repair), and Salem and Tiruchirappalli (major industry). These corridors will go a long way in developing an in situ pool of skilled workforce and providing job opportunities for the locals. The DICs are expected to contribute significantly towards building a strong defence industrial base in the country. However, their success will largely depend on the engagement of the private sector and incorporation of the MSMEs.

Reality Check

The significant progress achieved by the Indian defence industry and considerable enhancement of its capabilities over the years has been attributed to several factors, primarily the initiation of several path-breaking reforms and extensive investments. Salient facets are summarised below.

Production Turnover

The production turnover of the defence industry has continuously increased, reaching a figure of US$ 15.37 billion in 2023–24.[23] There has been laudable progress in the production of high-end weapon systems, be it naval, air or ground-based platforms, showcasing India's confidence and capability. *INS Vikrant* aircraft carrier, the largest warship ever built in India, was commissioned in 2022. Frigate *INS Vindhyagiri* (Project 17 A), built by Cochin Shipyard Limited with over 70 per cent indigenous content, was launched in 2023. On 15 January 2025, the Indian Navy commissioned three new frontline combatants—Destroyer *INS Surat* (Fourth and final vessel under Project 15B), Frigate *INS Nilgiri* (Project 17 A) and Kaveri Class Submarine *INS Vaghsheer*.

HAL has received the order from the Indian Air Force (IAF) for 83 LCA Mk I (Tejas), with 97 more cleared for purchase.[24] It is working on the Advanced Medium Combat Aircraft (AMCA), the fifth-generation fighter jet. The AMCA programme is set to accelerate with the central government's approval for design and prototyping phase. The first prototype is expected by 2028, with testing possibly starting in 2029. Certification and production

are planned for 2032–33, with induction into IAF by 2034.[25] It is pertinent to note that fifth-generation fighter aircraft projects of South Korea's KF 21 Boramae and Türkiye's KAAN began almost at the same time as that of India's AMCA programme. Incidentally, both these aircraft have already undergone successful prototype flights.

The DRDO has developed advanced main battle tanks, artillery systems and a variety of missiles, such as the Agni and BrahMos series. Additionally, the defence industry is focused on developing electronic warfare tools, unmanned aerial vehicles (UAVs) and secure communication networks for command and control. Research in robotics, cybersecurity and AI, alongside efforts by CERT-In, aims to further strengthen national defence capability. Given the growing capacity of the domestic industry, MoD is now awarding complex projects to local manufacturers in both public and private sectors. Bharat Electronics has been awarded the contract for the medium-power radar and integrated warfare system; HAL is to produce HTT-40 basic trainer and Dornier 228 aircraft; L&T is to build cadre training ships; and Goa Shipyard Limited and Garden Reach Shipbuilders are to produce offshore patrol boats and missile vessels.[26]

Defence Exports

India's total defence exports during the last decade totalled around US$ 11 billion. There has been a significant increase in defence exports, reaching an all-time high sales of US$ 2.63 billion in the financial year 2023–24, marking an increase of nearly 32 per cent.[27] India now exports arms, ammunition and equipment to over 90 countries and figures in the list of top 25 countries in defence exports. The surge in exports of defence arms and equipment can be attributed to key initiatives such as the Defence Production and Export Promotion Policy (DPEPP), focus on quality and cost-effectiveness of products and the ongoing conflicts in Ukraine and Middle East, along with tensions in various regions.

The defence exports towards ASEAN countries have picked up, with India bagging a major deal to supply BrahMos to the Philippines, valued at US$ 375 million in 2022.[28] The first batch was delivered in April 2024. The Philippines land forces have shown interest in acquiring the land-based version of the BrahMos missile system, while Malaysia, Thailand, Vietnam and Philippines have expressed interest in importing the Akash Weapon System.

The US, France and Armenia have emerged as India's top three defence customers. Defence exports to the US include a significant quantity of aircraft

and helicopter components for leading global defence firms such as Lockheed Martin and Boeing, besides personal equipment like helmets and bulletproof jackets. Exports to France include software and electronic equipment. A firm implementation of the offset policy, coupled with other initiatives, has contributed significantly to India's defence exports success story. The country has emerged as Armenia's largest defence partner, with big-ticket export items including Akash 1S Short Range Air Defence SAM (SRSAM), Pinaka Multi Barrel Rocket System artillery howitzers, anti-tank rockets and anti-drone systems, valued at around US$ 2 billion.[29]

India's defence exports to Africa are also steadily rising and account for around 15 per cent of the total exports.[30] Main exports items include small arms, ammunition, land warfare equipment, armed personnel carriers, drones, helicopters, offshore patrol vessels and lightweight torpedoes. Seychelles, Mauritius and Mozambique are major defence import partners of India. TASL has signed a deal with Morocco to set up the final assembly line for the production of 8×8 wheeled armed platform (WhAP).[31] In an effort to scale up defence capabilities of Africa, India hosted army chiefs from 20 African nations in March 2023 to inspect indigenously manufactured defence equipment.[32]

Many nations have shown interest in purchasing major defence equipment manufactured in India, including fighter jets, helicopters and artillery systems. However, there is intense competition from countries like South Korea, China, Türkiye and even Pakistan. Case in point: India's LCA Tejas lost the Malaysian fighter jet deal to South Korea's FA 50 light attack aircraft.[33] Moreover, JF-17 fighter jets, co-developed by China and Pakistan, have been purchased by Nigeria, Myanmar and Azerbaijan, while Iran and Bangladesh are touted as potential buyers, whereas Tejas is yet to open its export account.

Impediments to Indigenisation

India's defence industry has a long way to go as the indigenisation achieved so far largely pertains to low-technology items. Out of 36,000 items offered for local production, 12,300 items claimed to have been indigenised by the MoD include spares like valves, nozzles, washers, nut bolts and screws, etc.[34] MoD's restrictive approach and tedious process towards transfer of technology (ToT) from foreign firms in critical areas impede the indigenisation of the larger platforms. Case in point is the unduly delayed Project-75 India (P-75I) submarine programme, a critically required addition that has been in limbo for over 15 years. The project involved building six diesel-electric conventional

submarines (SSKs) by either Mazagon Dock Shipbuilders Limited (MDL) or L&T in tie up with overseas OEM builders. As per recent reports, finally the contract is likely to be awarded to German's Thyssen Krupp Marine Systems.

While India's arms imports have come down by almost 32 per cent since 2015, it remains the second largest buyer of weapons and equipment in the world.[35] It is a pity that while India is developing and manufacturing major weapon systems, it has not achieved self-reliance even in small arms. Around 72,400 SIG Sauer rifles were imported following Chinese incursions in Ladakh in 2020. India had to engage in joint manufacture with Russia (Indo-Russian Rifles Private Limited) to manufacture the assault rifle AK 203 at Amethi.[36]

Challenges

India's defence industry faces numerous challenges, the foremost being the scaling up of existing production capacities to meet the requirements of the armed forces. A holistic ecosystem is required to synergise national-level efforts to exploit prevailing opportunities as the global environment is favourable to India. This entails the formulation of a long-term vision accompanied by a strategic roadmap over next two to three decades, fully factoring the geopolitical milieu. Despite numerous initiatives by the central government to promote 'Atmanirbharta' and the 'Make in India' drive, many enterprises have been non-starters. Post COVID-19, around 56 companies exited China but only a handful relocated to India, with the majority shifting base to countries like Indonesia, Thailand and Taiwan.

Currently, India's defence industry is highly technology-dependent. To overcome this challenge, there is a need to enhance investment in R&D, which today is barely 0.7 per cent of the GDP. Instead of reinventing the wheel, technology transfer should be the preferred option. However, ToT is dependent on OEMs, which often comes with restrictions, hence posing a major challenge. Case in point is the current ongoing deal of ToT of GE F414 engines between GE Aerospace and HAL, wherein the former has agreed to transfer only 80 per cent of the technology. Even the procurement of GE F 404 IN20 engines for the LCA Mk IA has been unduly delayed, which has resulted in HAL providing only two Tejas aircraft as against 18 promised.[37]

Another major challenge in defence production is India's narrow industrial base. Incidentally, the manufacturing sector contributes only around 15 per cent to the GDP. Then, there is the dominance of the public sector and over-reliance on state-run enterprises, which usually lack the agility and efficiency of the private sector. The limited involvement of the private

sector companies in defence manufacturing has been attributed to high entry barriers and complex regulatory frameworks. Even the procurement process is cumbersome due to bureaucratic hurdles, leading to delay in acquisition and production.

Lack of skilled manpower in specialised fields, which is vital for high-tech manufacturing, is yet another handicap. India is currently experiencing an alarming shortage of skilled workforce, estimated to be around 150 million. The situation is further compounded given the increasing trend of bright and talented young people migrating to Western countries in search of better opportunities. Coupled with this is insufficient funds allocations for defence projects and infrastructure.

The interface between the industry and academia is an area that is vital for commercialising the technology. While academia contributes to basic research, it is the industry which translates the idea into product. Hence, coordination and collaboration between the two becomes vital. The recent initiative of DRDO and IIT Kanpur joining forces to establish a centre of excellence (DIACoE) is the right approach. Even the Armed Forces are increasingly reaching out to the academia to exploit the in-house expertise.

Way Ahead

There is lack of clarity and mistrust among the private defence manufacturers due to procedural hurdles, especially when it pertains to big contracts, make it virtually impossible for them to enter high-tech manufacturing. Whereas single-source procurement from the private-sector entities is avoided, the same is not the case when it comes to imports. This requires a mindset change. The local industry has to be nurtured and incentivised so that it can gear up to play a key role in achieving self-reliance.

The national policies must act as facilitator rather than regulator to enable leap-frogging. To this end, easing and streamlining regulations and procedures will lead to the creation of a conducive environment that increases the ease of doing business. Strategic partnerships and leasing options paving way for ToT must be encouraged. Establishment of Special Economic Zones (SEZs) in addition to DCIs for defence-related MSMEs would act as a force multiplier.

The Atmanirbharta programme needs to be practical and avoid overhype and unrealistic objectives. It will take a few decades before we acquire the capability to manufacture high-tech items like engines for aircraft, turbines for ships and advanced avionics and surveillance systems. For example,

China, which now possesses an advanced armament industry, depended on Russia till recently to power its aircraft. Even amongst the leading countries, collaboration is the norm to manufacture high-tech systems.

To emerge as a leading arms exporter, there is a need to scale up overall national defence exports. For example, China ranked fourth, accounting for 5.9 per cent of total global arms exports during the period 2020–24.[38] According to *Xinhua*, China's share of world merchandise exports in 2024 was around 14.5 per cent,[39] compared to around 1 per cent in 1973.[40] Defence exports, backed by a thriving defence manufacturing base, have enabled China to enhance its influence considerably, especially in our neighbourhood. On the other hand, India's arms export during the period 2020–24 accounted for barely 0.1 per cent.[41] Its share of world merchandise exports in 2024 was just 1.8 per cent[42] compared to around 0.5 per cent in 1973.[43] Research and development (R&D) investment made by China totalled US$ 495 billion in 2024, which is around 2.68 per cent of its GDP.[44] In India's case, in the Union Budget 2025, the Finance Minister announced a measly amount of around US$ 7.27 billion corpus for long-term funding of R&D projects, though this fund does not include deep defence technology.[45]

There is a need for higher allocations for the establishment defence innovation hubs and technology incubators. In many cases, when the quantities required are small, it is economical to import rather than manufacture locally by the MSMEs, which is commercially unviable. Lack of guarantees by the users for recurring orders is another commercial risk which adversely impacts domestic manufacturers. To this end, the efficacy of dual-use technology and products needs to be fully exploited. Further, the Qualitative Requirements (QRs) framed by the users must be realistic and frequent changes obviated as this results in undue delay in deliveries, besides cost overruns by the local suppliers.

One of the critical components of the industrial ecosystem is the creation of robust infrastructure through multipronged connectivity and dependable supply chains to support the manufacturing facilities and testing laboratories. It is imperative to establish state-of-the-art training facilities to develop skilled personnel and nurture talent. Specialised courses must be introduced to train and develop a highly specialised workforce. Simultaneously, concrete measures need to be instituted to curb the brain drain and incentivise exceptionally talented individuals to contribute to indigenous high-tech defence production.

All said, there is a need for fresh impetus through a second round of reforms to ensure further simplification of the systems across the spectrum,

enhancing the capability of domestic companies to absorb the transferred technology, making higher investment in R&D and unshackling existing gridlocks. This requires a holistic approach and requires a clear roadmap based on national security strategy, encompassing investment in R&D, fostering innovation, developing infrastructure, engaging in public–private partnership (PPP) and collaboration with foreign partners, nurturing a skilled workforce and scaling up the national comprehensive capacity. There is an urgent need to involve the private sector to augment the current manufacturing capacities of the PSUs. Case in point is HAL, which has grossly failed to meet the yearly targets, an issue recently flagged by the Chief of Air Staff with deep concern. The MoD has mandated HAL to deliver 16 Tejas aircraft in 2025, followed by an ambitious annual target of 25 from 2026 onwards. Consequently, to ramp up the production capacity, HAL is now collaborating with private-sector companies like L&T and Dynamic Technologies.

Conclusion

Given the enormity of India's security challenges, self-reliance in defence is no longer an option but an imperative as national security cannot be outsourced. India's past quest for self-reliance in defence manufacturing did not yield the desired results due to several factors. The main reason was the lack of a basic grasp of the complexities of security dynamics and understanding as to what it takes to achieve self-reliance. This is feasible only when a nation anticipates the threat well in advance and prepares to meet it through a well-planned strategy. It implies undertaking deep-rooted defence reforms aimed at modernisation, which are doctrine-cum-technology-driven. Unfortunately, in India's case, long-term assessment and preparedness to counter the threats has been deficient, evident from the fact that except for 1971 Bangladesh War, the rest of the major wars and conflicts were largely in the form of crisis responses. Consequently, the acquisition of arms and equipment was undertaken to meet the immediate requirements, and procurements depended upon the availability in the global arms markets.

The aim of self-reliance is to equip the armed forces with matching equipment of the adversary, if not superior. With regard to defence requirements, at present, four countries can be identified as self-sufficient to a large extent, namely US, Russia, France and China. The other countries procure varied quantities of defence requirements from outside, either by way of outright imports or through collaborative efforts. India could not have obviated its reliance on the defence imports as our civil industry was

not geared to even manufacture sub-contracted parts of small arms like the carbine. Post independence, during the 1960s and 1970s, efforts to develop fighter aircraft (e.g., HF-24 project), tanks or missiles did not make much headway due to the absence of the required ecosystem and meagre allocations of funds. Therefore, successive governments opted for the licensed production of fighter jets, artillery guns and naval vessels without absorbing the technology and designing the next-generation equipment.

The Indian government has launched the 'Atmanirbharta' and 'Make in India' programmes to achieve overall self-reliance in the defence and aeronautical domains. To ensure success of the initiatives, it is imperative that the programmes are backed by long-term sustainable planning mechanisms aimed at the growth of the defence industry. It entails the promotion and increasing role of the civilian industry, especially in the high-tech arena. Building state capacity requires a top-down approach, fresh thinking and avoidance of over-intrusive controls to nurture an entrepreneurial spirit. Overcoming the plethora of challenges facing the Indian defence manufacturing industry requires close monitoring and course corrections.

Despite some tangible achievements, the performance of India's defence manufacturing remains modest and disjointed. According to the report on 'Arms Production Capabilities in Indo-Pacific Region' by Stockholm International Peace Research Institute (SIPRI) in October 2022, it is unlikely that India will be able to significantly reduce its dependence on imports in the short or medium term. Going by the above report, 84.3 per cent of the major arms procured by India during the period 2016–20 was of foreign origin, with licenced production accounting for 57.8 per cent and domestic production comprising barely 15.7 per cent. However, the domestic shipping industry was an exception, accounting for over 78 per cent of the total procurement of the naval vessels procured by MoD.[46] Even in air defence systems, the local industry was able to meet the requirements to a fair extent. For major components like engines, turbines and radars, dependency on the foreign sources is set to continue. Going by the above report, the predominance of DPSUs may not be conducive to achieve self-reliance in the Indian defence production sector.

To effectively meet the complex security threats in the future, the Indian Armed Forces should develop requisite capabilities to be future-ready. To this end, the national security policy and defence strategies need to align technology with the warfighting doctrines. A comprehensive National Security Strategy is indispensable for sustained defence modernisation and indigenisation process which, regrettably in our case, still remains a work in

progress. Consequently, it adversely impacts standardising of the tri-service organisational structures and the selection and development of suitable weapon systems to ensure optimal jointness. The post of Chief of Defence Staff (CDS) was created in 2020 to achieve greater tri-service integration and capacity-building, but little progress has been made so far due to dichotomy in the structural framework and lack of robust higher direction.

Development of indigenous capabilities is crucial for achieving self-reliance to ensure strategic autonomy and sovereignty. It implies capability of the local industry to design, develop and manufacture state-of-the-art arms and equipment to cater to the requirement of the armed forces in the given timeframe. However, the quest for self-reliance should not adversely impact operational efficiency. India's defence industry has made tangible progress over the years. To achieve a high degree of self-reliance, enhancing the overall industrial capacity of the nation is vital, which requires decades of collective effort.

Notes

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