

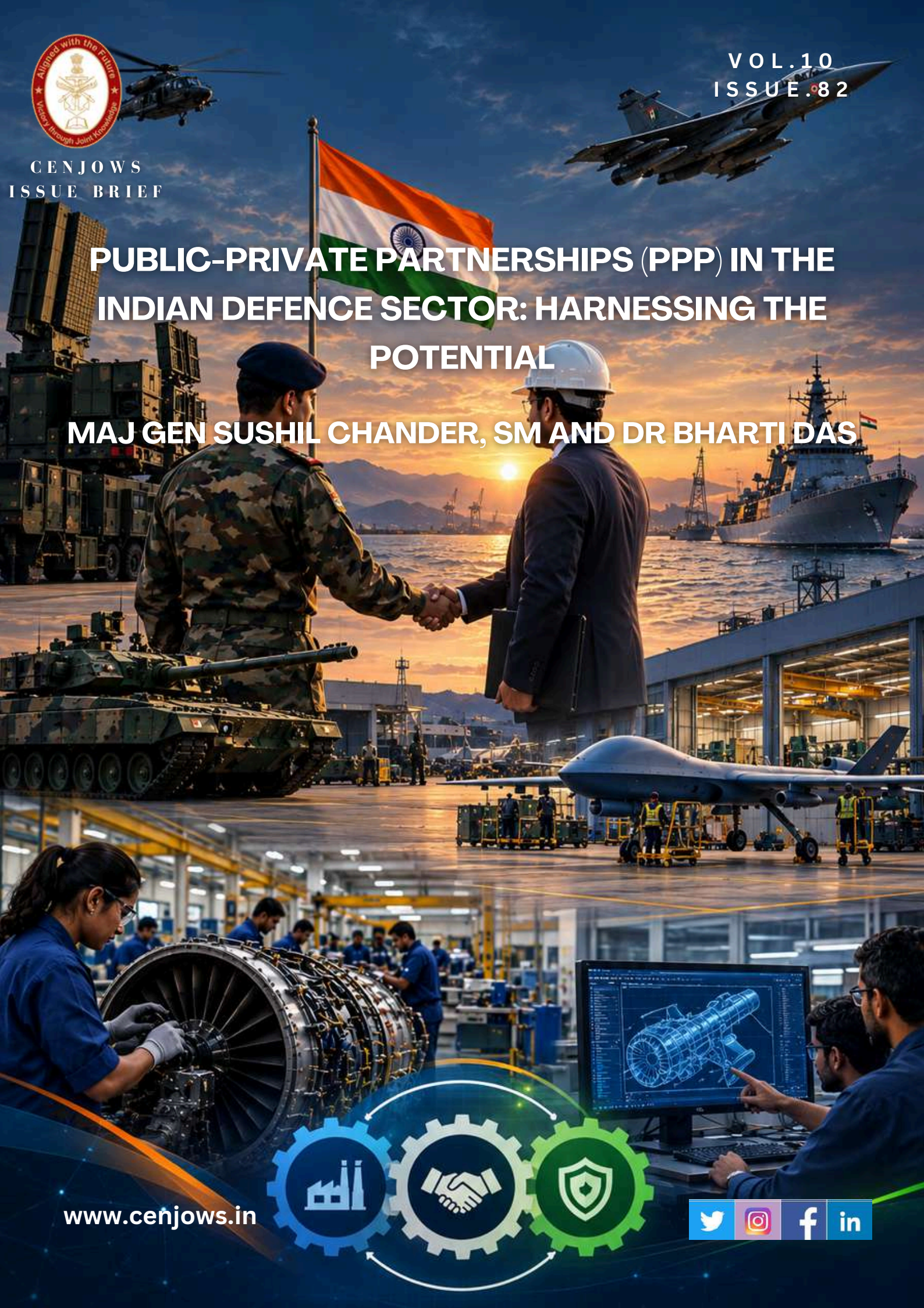


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PUBLIC-PRIVATE PARTNERSHIPS (PPP) IN THE INDIAN DEFENCE SECTOR: HARNESSING THE POTENTIAL

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ABOUT US

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**PUBLIC-PRIVATE PARTNERSHIPS (PPP) IN THE
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CENTRE FOR JOINT WARFARE STUDIES



CENJOWS

Public-Private Partnerships (PPp) in the Indian Defence Sector: Harnessing the Potential



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“Public-Private partnerships can bring a Defence Production Revolution.”

Raksha Mantri Shri Rajnath Singh ji
(Address at SIDM Annual Meeting),
Sep 2021.

Introduction

Opening the Defence Sector for participation of the domestic private industry, in May 2001 was a milestone event, an unprecedented step taken by the then Atal Bihari Vajpayee government to unshackle the monopoly enjoyed by the public sector enterprises hitherto with respect to defence R&D and productionisation. Post-independence, the Defence Sector, primarily ‘Arms and Ammunition’, was reserved solely for the Public Sector Enterprises, vide Industrial Policy Resolution of 1956, Schedule A.¹ The Indian Military-Industrial Complex saw substantial expansion over the decades, becoming one of the top 15 in the world. However, the private industry was not permitted to participate in the Defence Sector until 2001. Besides, the procurement of the arms, ammunition and defence

equipment, in India was known for the legendary bureaucratic maze, highly complex & cumbersome acquisition processes & procedures, and lingering doubts over the capacity & capability of the private industry to effectively fulfil the demands of military platforms and munitions that carry stringent qualitative requirements.

The participation and contribution of the domestic private defence industry improved over time, and the possibilities of Public-Private Partnership (PPp) in varied projects were increasingly explored. The change in mindset of stakeholders, rising acknowledgement of the management acumen of private industry, the requirement of private investments in major defence projects, and the desire to acquire self-sufficiency in military hardware all acted as catalysts for encouraging the PPp route for defence manufacturing and R&D. The PPp in defence, formally gained traction in the country only in the last two decades, however, certain private companies like Walchand Industries had been participating in specific projects, even prior to 2001. The PPp model is seen to be extensively utilised by the leading powers, viz. the United States of America, China and South Korea, etc, for development of niche technology, military items' productionisation and execution of complex mega projects in the defence sector.

In 1999, during Operation Vijay (Kargil War), the ammunition for Bofors guns had to be imported at short notice, even though India boasted of a large military-industrial base. With the Indian Army staring at the perils of dependence on other countries for military hardware, the Kargil Committee was formed post-war. Finally, acting on the recommendations of the Kargil Committee, in 2001, the Indian Government permitted full participation of the domestic private industry, subject to licensing,² to break away from the heavy import dependence in the defence sector.

India was rated as the top importer of arms by SIPRI (Stockholm International Peace Research Institute), and imported 10 (ten) per cent (by value) of all global arms imports for two decades (2001-2020) and was closely followed by China at 7.2 percent and Saudi Arabia at 5.9 percent.³ In the year 2020, the value of imported defence items by India, as per All India Association of Industries, was estimated at US\$ 463 million.⁴ The import of 'Arms', for the period 2020-2025, as per SIPRI data, reduced to 8.6 per cent of the global arms imports, yet India was the top importer, with Ukraine, Saudi Arabia, Qatar and Pakistan making up the top five.⁵ However, with the thrust on Atmanirbharta, the situation has changed considerably in the last decade, and the import of defence equipment has

seen a significant decline, while the exports have witnessed a multi-fold rise, owing to numerous policy initiatives and a multi-pronged approach adopted by the government.

PPp, which is essentially a contract between the government and a private entity, has strengthened the Military-Industrial Complex and contributed to the country's efforts to make rapid strides towards Atmanirbharta. The private entity makes investment, accepts the risk, and receives a return on investment, as per the specified terms and conditions of the PPp contract, based on its performance.

Why is the PPp in Defence required?

- The need for rapid development in the fields of drone and anti-drone systems, advanced materials, 3D printing technologies, unmanned weapon platforms, AI and cyber technologies, modern active and passive camouflage systems, quantum technologies, etc., has necessitated collaboration with private industry, and PPp is an effective route for ensuring close cooperation. The PPp route can also be taken to facilitate joint efforts in acquisition, military equipment maintenance, supply-chain integration and infrastructure initiatives.
- Substantial investment from the private industry contributes to building better infrastructure in a shorter time frame, improving existing capacities or capabilities, and sustaining them than a wholly public or wholly private enterprise.
- Along with the investment, the private entity brings with it management skills and expertise. Input from private entities during the consultation phase helps establish realistic expectations for the proposed venture.
- A timely project completion is invariably incorporated as a performance-measurement parameter. Besides, the risk assessment is considered during the 'Feasibility Study' and shared among the cooperating entities.
- Reasonable assessment of the proposed costs can be made, barring exceptions, leading to better price discovery. Besides, with mutual consultation and due diligence, the parties can amicably reach solutions in most cases.

Major Defence PPp Projects

The Integrated Guided Missile Development Program, Space Technology Projects, naval ship and submarine building, weapon platforms, and numerous other defence projects have seen successful collaboration between public and private entities. Some of the defence projects of significance, undertaken through the PPp route, are briefly discussed hereunder: -

- **INS Vikrant.** The Indian Navy's Warship Design Bureau designed the biggest indigenous warship, and Cochin Shipyard Limited (CSL) built it. The aircraft carrier operates 30 aircraft (both indigenous and imported) and was commissioned into the Indian Navy on 2 September 2022. With 76 per cent indigenous content, the project includes active participation from over 550 OEMs, 100 MSMEs,⁶ and numerous Indian public entities. It symbolises India's growing self-reliance in the defence sector.
- **BrahMos.** The joint venture (JV) between India and Russia to develop this state-of-the-art supersonic cruise missile saw the participation of over 200 small, medium and large-scale companies. Besides, many Indian companies also invested to sustain the program.⁷
- **Pinaka.** DRDO carried out the overall design and development, while Tata Power SED, Larsen & Toubro (L&T), and the erstwhile Ordnance Factories' Board (OFB) developed the sub-systems and components.⁸ This Multi-Barrel Rocket Launch (MBRL) System is already inducted in the army, while the upgrade of munitions is in progress. Munitions India Limited manufactures the rockets at its factories in Chanda, Maharashtra, and Badmal, Orissa.
- **Air Defence System - Akashteer.** Akashteer works seamlessly with the Integrated Air Command and Control System (IACCS) and Trigun (the Indian Navy's maritime domain awareness and operational system) to provide a real-time battlefield picture and enable timely employment of offensive and defensive weapons. DRDO developed this fully indigenous system with multiple public and private sector partners, and it performed exceedingly well during Operation Sindoor.

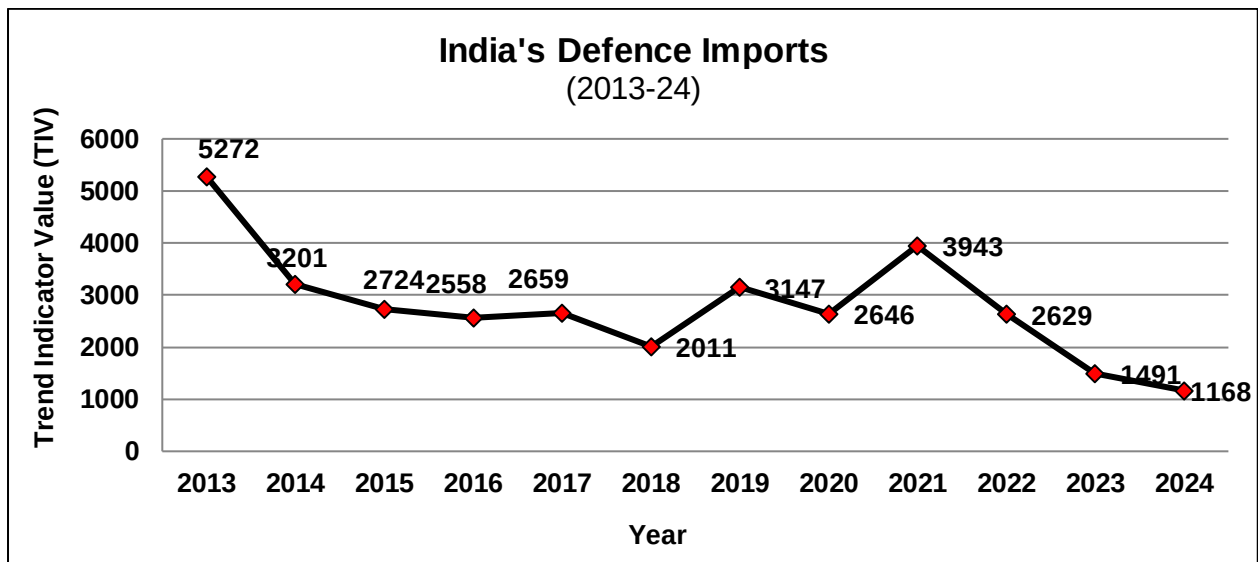
- **Advanced Towed Artillery Gun System (ATAGS).** The ATAGS (155mm x 52 Calibres) is a product made on PPp model jointly by the ARDE (Armament Research and Development Establishment),⁹ in partnership with Tata Advanced Systems and Kalyani Group.¹⁰
- **SSBN (Ship Submersible Ballistic Nuclear) Submarines.** SSBN submarines were developed by the DRDO, Indian Navy and Bhabha Atomic Research Centre (BARC) jointly, while the private industry, to include Tata Power and Larsen & Toubro (L&T), actively contributed to the project.¹¹ Developed under the PPp model, Arihant was commissioned in August 2016, INS Arighaat in August 2024 and Aridhaman in Apr 2026.
- **Development of Missiles.** In 1983, the DRDO, with close cooperation of academia, domestic entities and the defence forces, initiated the strategic missile development program named IGMDP (Integrated Guided Missile Development Programme) to indigenously develop Agni, Prithvi, Akash, Trishul and Nag missiles. The ecosystem of public and private industries and the human capital created by the programme have made possible hypersonic technology demonstrators and the MIRV test of the Agni-V missile in March 2024 under Mission Divyastra.¹²
- **LCH (Light Combat Helicopter).** The ADA (Aeronautical Development Agency) designed and developed the LCH, and HAL (Hindustan Aeronautics Limited) built it. It is essentially a PPp project, as a number of public and private industries, research establishments, defence forces, and academia participated in it. The LCH 'Dhruv' was followed by LCH 'Rudra' and the recent LCH Prachand. Private industry's involvement in LCH Prachand is estimated at 40% of the total project value of ₹62500 crore, and it would manufacture different sections, viz. fuselage, wings, and other components.¹³
- **Pralay - The Canisterised Missile.** The solid-fuelled, short-range, surface-to-surface tactical missile caters to address targets up to 500 km. MSMEs (Micro, Small, and Medium Enterprises) supplied materials and structural components for the mobile launch systems and thus contributed effectively to supporting the high-tech defence project. Further, the government is already considering the

participation of the private industry as development & production partners as a part of the manufacturing ecosystem. Domestic private companies, namely Adani Defence and Bharat Forge, etc., may participate along with public entities.¹⁴

- **New Projects.** Apart from the above, many new projects are underway in which the domestic private industry has been assigned the lead role. A significant decision by the Indian government is to shortlist three companies, viz., Tata, L&T and Bharat Forge, to develop the Advanced Multirole Combat Aircraft (AMCA). The selected firm, in partnership with the Aeronautical Development Agency (ADA), will manufacture five AMCA prototypes.¹⁵ Go-ahead for the AMCA project was given by the government in Feb 2026, amongst several other projects, giving a big boost to the PPp in the Defence Sector.¹⁶ In addition, work on several advanced technologies, including AI-powered pilots, quantum computing, robotics, land platforms, and net-centric warfare systems, is progressing quickly.

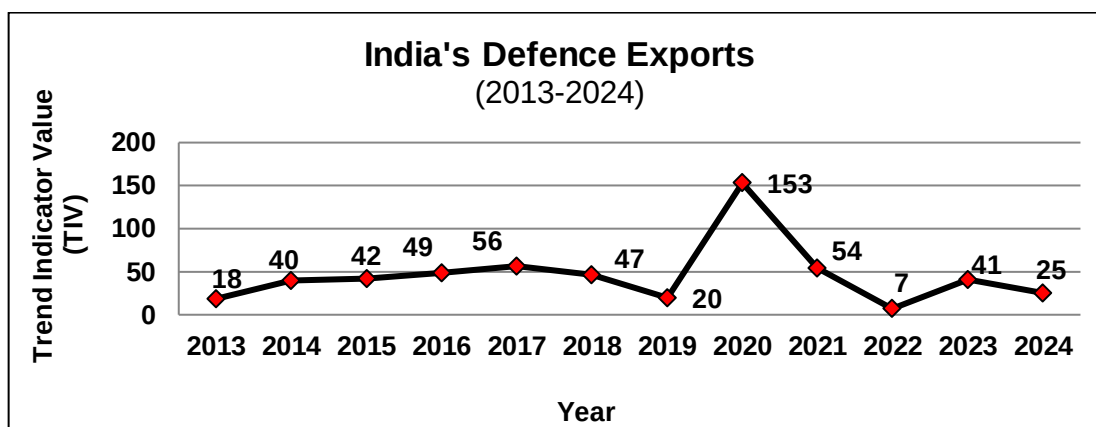
Impact of PPp

- **Defence Imports – The Downward Spiral.** A drastic reduction in defence imports is evident, as per SIPRI's Arms Transfer data, for the period 2013-2024, as depicted in the chart hereunder: -



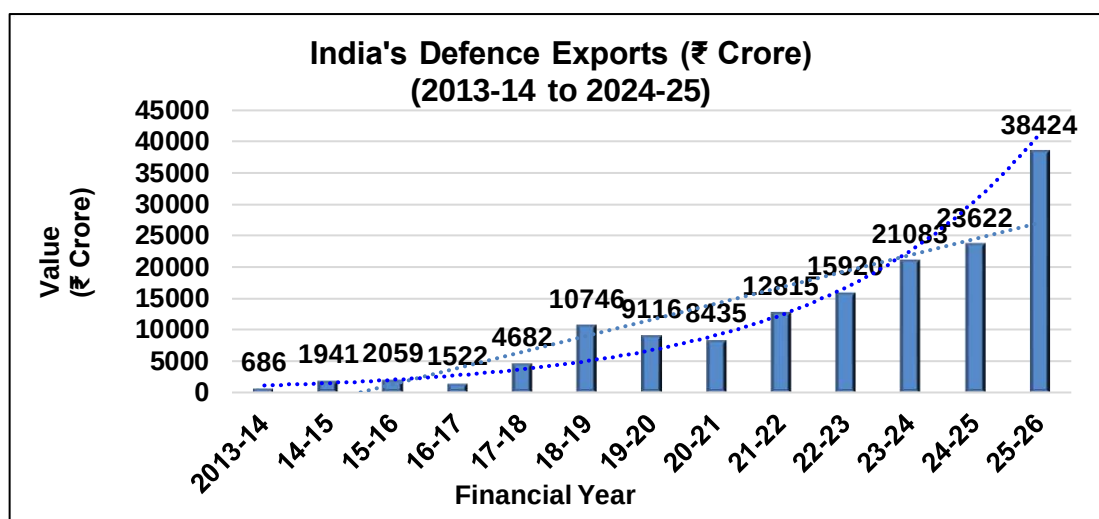
(Source. SIPRI 'Arms Trade Data'. TIV is a measurement unit created to track the volume of major conventional weapons transferred between countries rather than their actual financial price.)

- A significant downward trend is evident in the transfer of arms/military resources to India from foreign countries, indicating enhanced emphasis on self-reliance and indigenous defence equipment production. PPP, supported by the Positive Indigenisation Lists promulgated by the Indian Government, have significantly contributed to meeting the country's domestic defence requirements and thus helped reduce imports of defence equipment.
- **Growing Defence Exports.** Overall, Indian defence exports account for 0.2 per cent of global exports, according to SIPRI's 'arms trade data'. Except for the year 2022, when a downturn was evident due to India's standoff with China on the country's northern frontiers, defence exports have exhibited a positive trend,¹⁷ as depicted by the trend indicator values in the chart hereunder: -



(Source. SIPRI's 'Arms Transfer Database').

- The real picture of defence exports emerges from data provided by the Press Information Bureau of the Ministry of Defence, which shows that India's defence exports rose 34 times over the past decade. The Indian defence exports stood at ₹38,424 crore in the financial year 2025-26, vis-à-vis ₹686 crore in FY 2013-14.¹⁸ In FY 2025-26, the private industry exports were ₹17,353 crore (45.16 per cent), while DPSU exports were ₹21,071 crore (54.84 per cent). Currently, India exports to 80+ countries, including the USA, France, and Armenia, and is strengthening its presence at the global level.¹⁹ The growth in defence exports is indicated in the chart hereunder: -



The Reform Drive. The Indian Government recognised that PPP is a viable and credible option for collaboration with the domestic private defence industry and to pursue the stated goal of Atmanirbharta in the defence sector. Some of the significant steps taken by the government are discussed hereunder: -

- o **Encouraging R&D.** The Defence R&D Organisation (DRDO) budget was enhanced by 12.4 per cent from ₹23,855 crore in FY 2024-25 to ₹26,816 crore in FY 2025-26 and further to ₹29,100 crore in the current financial year, and a major proportion (₹17,250 crore) out of this stands earmarked for capital procurement.²⁰ The R&D for developing advanced defence technologies, with a focus on fundamental research and hand-holding of the private entities through the Technology Development Fund as Development-cum-Production Partner, has received an impetus. DRDO has established fifteen Centres of Excellence and sanctioned 148 new R&D projects during 2022–23 to 2024–25. Proactive action and collaboration will stimulate the development of futuristic technology in the defence sector. Further, the Army Design Bureau (ADB) actively promotes and funds R&D projects. At the central level, the Vice Chief of Army Staff (VCOAS) is empowered to approve funds for research through the private industry up to ₹35 crore, and the Army Commanders at the Command HQ can approve up to ₹15 crore for research through the private industry, under Schedule 9.1 of army Schedule of Powers promulgated in 2026. In addition, government funding for R&D also enables research by public entities, alongside the indigenisation of imported items. However, attracting sufficient investment from private sector entities in defence research

projects is vital; without it, the domestic defence industry would continue to lag in technology and capacity vis-à-vis advanced countries.

- o **Nomination to Level Playing Field in Defence Procurement.** Of the total Buy (Indian) capital acquisition by the Indian Army, of Rs 52,700 Cr for the years 2016 to 2019, a significant part of the procurement was based on the nomination of public sector Enterprises. This issue of preferential treatment through nomination has since been resolved, with public and private entities competing in all procurement projects. In FY 2025–26, 75 per cent of the capital acquisition budget, i.e., ₹1.11 lakh crore, was reserved for procurement from the domestic defence industry. A similarly percentage of the capital acquisition budget amounting to ₹1.39 lakh crore was also earmarked in FY 2026-27,²¹ and DPM 2025 emphasises ensuring a level playing field in defence procurements.
- o **Excise Duty Exemption Withdrawn.** Effective from June 2015, the exemption of excise duty, which had been available to all Defence Public Sector Entities, was withdrawn.²² All Indian defence manufacturers have since been subjected to similar excise duty levies, thus negating the advantage that was enjoyed by the public sector entities, hitherto.
- o **Encouragement to MSMEs.** The Public Procurement Policy Order, 2012, for Ministries/Departments/Central PSUs, mandated an overall procurement goal of a minimum of 20 per cent from MSEs effective 01 April 2015.²³ To provide further stimulus, 25 per cent product reservation for MSEs (Micro and Small Enterprises) has been introduced in the Defence Procurement Manual (DPM) 2025.²⁴
- o **Splitting of Ordered Quantity among Vendors.** Splitting the order quantity among vendors in a development or procurement project, on fulfilment of the cost and quality criteria, is permissible if already included in the Request for Proposal at the tendering stage. The contract for quantity 307 ATAGS (Advanced Towed Artillery Gun System) was split in a 60:40 ratio between Bharat Forge Limited (184 guns) and TASL (Tata Advanced Systems Limited) (123 guns).²⁵

- **Technology Perspective and Capability Roadmap (TPCR) in Open Domain.** Placed in the open domain, the TPCR-2025 outlines the equipment envisaged for acquisition by the Indian Defence Forces.²⁶ The roadmap will facilitate better planning, partnerships, and manufacturing estimates and stimulate futuristic technology development to indigenously meet the requirements of the defence forces over the next few years.
- **Placing Make Projects' Lists in Open Domain.** Lists of 144 Make projects (including 38 Make-I, 102 Make-II and two Make-III projects) for indigenous manufacturing of armament/equipment, seeking participation of the domestic defence manufacturers, have been placed in the open domain.²⁷
- **Indigenisation of Imported Items.** The Defence Forces are already indigenising imported assemblies, sub-assemblies, and spares for in-service weapons & equipment, with respective Directorates of Indigenisation (DoI) of the three services, playing a pivotal role. The government has further boosted indigenisation efforts by placing 47916 items in the open domain on the Srijan portal, enabling participation by domestic industry.²⁸
- **Transformed Tax Structure.** The reform carried out in Sep 2025 has a significant impact: in a range of military equipment the GST (Goods & Services Tax) has either been exempted or significantly reduced. The GST reduction applies to military drones/UAVs, certain military transport aircrafts, communication systems, etc. Besides, heavy calibre rockets, missile systems, simulators, certain underwater platforms and spares of weapons/aircrafts now face zero GST.²⁹
- **Acceptability of Simulation Based Trials.** When trials are not visualised, or field evaluation is not feasible, the evaluation may be based on computer simulations or documented historical data to validate the vendor-provided parameters, and this should be included in the 'Statement of Case' when seeking the AoN.³⁰ With respect to 'User Trials', if the probability of deployment is 'not high' under certain conditions, appropriate certifications from vendors may be obtained, and simulation-based testing may be resorted to, wherever applicable,³¹ to save considerable time and speed up the acquisition process without compromising on assessment rigour.
- **Acceptability of Single Vendor Situation (SVS).** In procurement cases wherein a single bid is received at the bid submission stage, the DAP permits completion of

the TEC without retracting the RFP. Based on a fair assessment, such a single-vendor case may be progressed with the approval of the AoN (Acceptance of Necessity) according to authority. The DAP emphasises that efforts should be made to complete the acquisition process within the original validity of the commercial bid in single-vendor cases.³²

- o **Accessibility to the Defence Forces.** The private defence industry has greater access to the Indian Army through the Army Design Bureau (ADB) and direct contact at the level of Command Headquarters. This institutionalised mechanism has largely evolved to encourage better communication with the defence authorities and helping the industry to understand the ongoing/future military procurement projects and plan accordingly.
- o **Government and Public Entities as Facilitating Agencies.** Various departments of the Ministry of Defence (MoD), viz., the Defence Production (DDP), DRDO, and DPSUs, act as facilitating agencies for private companies to enter into Joint Ventures (JVs) for the manufacturing of modern weapon platforms and munitions for the defence forces. The DRDO has also shared technology, without charging any fee for ToT (Transfer of Technology), with the shortlisted companies as Development cum Production Partner (DcPP)/Production Agency (PA)/Development Partner (DP),³³ and encouraged productionisation of military platforms/equipment by the domestic private defence industry.
- o **Participation by Joint Ventures (JVs) in 'Buy and Make' Procurement Category.** This category permits an initial direct purchase from a foreign vendor, followed by manufacturing by a domestic Production Agency (PA) with transfer of technology (ToT) as per the contract. Vendors eligible for participating in the higher category can participate in the lower category.³⁴ Thus, a weapon system/ equipment which is developed abroad by a Joint Venture (JV) between an Indian company and a foreign partner may be fielded under this category while ensuring compliance with the guidelines for indigenous content and ToT.
- o **Government Lines of Credit for Export of Defence Equipment.** Promotion through the 'Lines of Credit' for indigenously manufactured defence equipment/items is being actively carried out.³⁵ A \$500 million credit line to Vietnam has enabled the procurement of high-speed patrol vessels from India.³⁶ Similarly,

India offered lines of credit for \$500 million to Bangladesh (2019/2021), \$100 million to Mauritius (2021), and \$1 billion to African countries to enable them to buy Indian defence equipment.³⁷

Has the Potential of PPp in Defence been Adequately Harnessed?

Let us consider the participation and contribution of the domestic private defence industry in PPp projects and through other private industry-led initiatives. In the high profile PPp projects as discussed in the preceding paragraphs, the domestic private industry has actively provided assemblies, spare parts and services. However, spectacular breakthroughs by the private industry in terms of new technologies or weapon systems/equipment are yet to be witnessed, barring exceptions in the development and manufacturing of ATAGS, certain naval vessels and few other weapon systems/equipment. The manufacturing of the K9 Vajra Self-Propelled Artillery Gun System, loitering munitions, etc., by the private industry is primarily relying on the ToT from foreign OEMs or Indian public entities/DRDO. The indigenous design, development & manufacturing of the majority of the modern military weapons/equipment is still being led by the public enterprises. The potential of the domestic private defence industry can be said to be “Truly Realised”, through the PPp or otherwise, when the contribution of the private industry in the design, development & manufacturing of futuristic projects, equals or exceeds the share of public enterprises.

Indian private companies, viz. Tata Advanced Systems, Reliance Defence, Mahindra Defence Systems Limited, Larsen & Toubro Defence, and Adani Defence & Aerospace, amongst others, are leading the domestic defence industry push and collaborating with foreign and Indian companies to be part of the global defence supply chain. Numerous steps to promote transparency, merit-based competition and equitable opportunity have been taken by the Indian government, yet certain issues remain to be addressed, and additional measures need to be instituted to give further boost to the domestic private defence industry.

Issues that Merit Attention

Certain issues of significance that need addressal are discussed hereunder: -

- o **Dominance of the Public Entities.** The DPSUs contributed 79 per cent and 77 per cent of the total domestic defence items manufacturing output in FY 2023-24 and 2024-25; the rest was from the domestic private industry.³⁸ The domestic

private defence industry still has a long way to go before it matches the public sector entities in contribution to the indigenous defence design, development and manufacturing.

- o **PPp in the Digital Domain.** PPp in the digital domain remain challenging because of changing requirements, project complexity, and rapid technological change, which currently exceed the flexibility allowed under prevailing rules and regulations. As a norm, a PPp should last longer to turn profitable for the private investor and therefore needs a long-term contract or an extension of existing contracts through renegotiation. In certain cases, the PPp in the digital domain has been undertaken by the Indian Army. For instance, in the late 1990s, the Computerised Inventory Control Group collaborated with Tata Infotech Limited to digitise the inventory control functions of Central Ordnance Depot Delhi Cantt as a pilot project. Since then, the group has developed various packages and implemented ERP (Enterprise Resource Planning) in all the Central Ordnance Depots of the Indian Army. Apropos, adopting incremental partnership models and exploring collaborations may be considered as viable options.
- o **Competence Mapping.** Competence mapping, in terms of the capabilities and capacities of all private and public-sector defence entities, needs to be undertaken deliberately by a specially deputed organisation. It is vital and would serve the purpose if India were required to face a two-front or prolonged conflict. Comprehensive competence mapping of the Indian private defence industry is yet to be carried out. Diligently carried-out competence mapping can assess, with reasonable accuracy, the mass production capability, surge capacity, resurgence ability, and resilience of the domestic military-industrial complex.
- o **Lack of Flexibility in Procedures.** Rigid implementation of procedures and strict compliance with the rulebook, with no scope for discretion, leads to inflexibility and delayed procurements. The DAP (Defence Acquisition Procedure)-2020 is a 'Linear, Sequential, Paper-Based, Manual Digitisation, Life Cycle Focused Process' that involves varied trials and takes years (not months) to field the equipment. Typically, existing procurement processes often take longer than a single technological cycle (of 18 to 36 months) that witnesses the rapid development of artificial intelligence, drones, space technologies, and cyber tools. The trend was bucked in the procurement case of the Rafale M fighter jet acquisition, wherein the

process was completed in under two years. The new DAP 2026, likely to be promulgated soon, is expected to address some of the procedural aspects and enhance the responsiveness and efficiency to complete defence acquisition projects in a sub-two-year cycle. However, the changes are incremental in nature and may not lead to transformational results.

The Road Ahead

“The decisive edge in warfare belongs to those who can adapt faster and strike unexpectedly”, was famously said by the Raksha Mantri (the Indian Defence Minister), Shri Rajnath Singh, in his address at the North Technology Symposium (NTS) at Prayagraj, on 04 May 2026. In this regard, the Indian Govt has formulated and implemented certain path-breaking policies to instil confidence in the private defence industry by creating a suitable business environment for effective contributions to the defence sector. The review of capital acquisition and revenue procurement procedures has made positive incremental changes to the existent processes. Further, the withdrawal of exemption of excise duty to public enterprises, increased limit of FDI (up to 74 per cent) through the Automatic Route, in the defence sector, promulgation of the Positive Indigenisation Lists, promulgating of the defence exports strategy, simplification of the process for obtaining defence industrial licenses, guidelines for forging joint ventures (JVs), review of the procedure for imposition of penalties for deliberate errors, and earmarking a significant proportion of the R&D funds for development of technologies by the private industry are some of the noteworthy measures that have already been successfully implemented. Though substantial ground stands covered, certain steps to encourage participation and appropriately harness the potential of the domestic private industry in defence R&D and manufacturing are deemed essential, as discussed hereunder: -

- o **List Specific Projects for PPP.** Identification and earmarking of military equipment for development under the PPP model has been implemented, and the details are placed in the public domain on the MoD website/ Make in India.³⁹ However, the MoD needs to launch more projects under the Make-I category. The project lists need to be revised periodically to keep the domestic Private Defence Industry updated on emerging requirements and encourage them to invest in defence indigenisation efforts on a large scale.

- o **Maintaining Sustained Capacity of domestic Military-Industrial Complex.** To encourage and maintain the sustained capacity of the domestic military/defence industry, consistent supply orders/contracts are vital. Sustenance is not feasible through orders from the Indian Defence Forces alone. The industry should be able to produce quality products at competitive rates and seek export orders to sustain and grow.
- o **Competence Mapping.** The competence (capability and capacity) mapping of the domestic defence industry (both private and public sector) to assess its surge capacity in wartime needs to be undertaken by the Defence Ministry, along with the Defence Forces and Commerce & Industry Ministry. Identifying competencies, surge, and resurgence capacity is vital to plan expansion and upgradation of the military-industrial complex over the next 10-15 years. The 'competence mapping' would also be useful in planning long-term futuristic, strategic defence projects (including through PPp) and for making accurate assessment of the outcomes.
- o **Integrated Innovation Ecosystem.** An integrated innovation ecosystem must be strengthened to encourage a bi-directional flow of technologies between civil and military establishments. Military technologies, with suitable modifications, may be used for civil applications, and civilian technologies could be adapted for effective use in the military. The HQ Integrated Defence Staff/Department of Military Affairs can identify such technologies in consultation with the Defence Ministry and domestic industry. The ecosystem needs to address key aspects of smooth technology transfer & absorption and follow up on production coordination.
- o **Developing the Futuristic Defence Technologies.** Incentivising private investment in futuristic defence technology R&D, with suitable handholding that includes liberal/full funding for strategic projects, is the need of the hour. The government should launch a public campaign to widely publicise public financing/subsidising of defence R&D. It should also consider a dedicated process to enlist credible research institutes, select MSMEs, private entities, and academia for R&D grants, with a specified methodology for measuring outcomes. The procedure for government funding for defence R&D projects should be available in the open domain. Further, all cases should be decided through a collegiate mechanism to avoid the influence of personal biases in the bureaucratic chain. The PPp in defence R&D is promoted by the government through various initiatives such

as Technology Development Fund (TDF), Dare to Dream, Transfer of Technology (ToT), Development cum Production Partner (DcPP) and Innovations for Defence Excellence (iDEX) etc. However, the quantum of funds available for R&D under these schemes is very limited and needs substantial enhancement. A non-lapsable corpus of Rs ten thousand crores (₹10,000 crores) is recommended to be earmarked for defence R&D projects to boost private-sector participation.

- o **Simplify the Procurement Procedures and Processes.** Flexibility in the acquisition procedure and a simplified process, while ensuring requisite transparency and probity, will facilitate expediting capital procurements and curtailing the timelines to one year. While the draft DAP-2026 addresses some teething issues through proposed incremental changes, it needs transformative reforms. Some suggestions are as discussed hereunder: -
 - **Emergency Procurement Procedure (EPP).** The EPP has been tested adequately and is recommended to be converted into a permanent process for procurement of capital and revenue assets. The process has been found effective for procuring urgently required armament/equipment post “Operation Sindoor” and presents a viable method to fast-track the process. The timelines can, thus, be brought down to 6-12 months, and the modernisation of the defence forces expedited.
 - **Implementation of e-Office.** All procurement cases need to be processed in digital format through the e-Office. Currently, the physical paper files are processed in the procurement chain, leading to delays and lack of accountability. Resistance to implementing the e-Office in the Ministry and bureaucratic circles must be tackled, and the e-Office package implemented with need-based amendments.
- o **Forecast the Procurement Numbers.** Promptly forecast the approximate numbers of weapons & equipment planned for future procurement. Continuity of orders will help mitigate the uncertainty that currently envelops the domestic private defence industry.
- o **Effectively Implement Policy on Public Procurement from Micro & Small Enterprises (MSEs).** Effective implementation of the mandated 25 per cent⁴⁰ share of public procurement from MSEs by the ministries/government departments

is essential for all defence items, including spares/assemblies. This would further encourage MSE participation in defence manufacturing and help in expansion of the domestic military-industrial complex.

- o **Test Infrastructure.** Inadequate availability of testing infrastructure is a constraint that needs to be addressed as a priority. As more domestic private defence companies engage in the production of defence equipment and munitions, the need for testing will also increase. Establishing a greater number of accredited labs that adhere to Indian Certification Standards is one step the government needs to take. The defence sector ecosystem needs to cater for adequate test infrastructure.
- o **Prioritise Consortium Approach.** For large, complex projects, a single company would struggle to cover all aspects, including system integration. Execution by a consortium of companies is likely to yield better and faster results. To achieve Atmanirbharta in a real sense, dependence on foreign entities for system integration should be avoided. The development and production of the BrahMos missile system by a consortium of companies present a successful example. Hence, for complex development-cum-production projects, participation may be restricted to the consortiums of companies. Such consortiums may include public entities as partners on an as-required basis.
- o **Encourage Venture Funds to Finance Defence Start-ups.** Encouragement is given to the establishment of venture funds, their early-stage institutional investment in new start-ups and as long-term development partners. The availability of finance to start-up companies and small businesses is likely to enable investment in R&D and encourage young entrepreneurs to convert advanced scientific projects into production-grade systems. Venture funds, including private investment, will enhance participation by start-ups, research organisations and non-traditional vendors, and accelerate prototyping and fielding timelines.
- o **Enhance Scope of Defence “Credit Policy”.** The defence credit policy/lines of credit enhance our country’s standing among the comity of nations, besides leading to the sustainment and expansion of the Indian Military-Industrial Complex. The scope of credit could be further enhanced by allocating more funds for the same and adopting aggressive outreach programmes led by Defence Attachés of Indian

Embassies for generating more demand for Indian-manufactured weapons and equipment.

Concluding Thoughts

PPp in the defence sector is vital to harness the potential of private and public entities and make rapid progress in the design & development and manufacturing of defence items, with a special focus on strategic ventures and futuristic technology projects. The relationship has already transformed from 'Buyer and Seller' to 'Partners', and an earnest endeavour is essential to adopt aggressive marketing strategies to sell 'Made-in India' defence equipment to friendly foreign countries, post fulfilling the own military's demands. The government would do well to act as a facilitator, guide, and insurer, demonstrating its unambiguous readiness to minimise risks in this sector of national importance. Leveraging the financial and techno acumen of private entities to expand indigenous design, development and manufacturing capability through the PPp will strengthen the domestic military-industrial complex and provide the required fillip to India's march towards Atmanirbharta in the defence sector.

Declaration

I declare that this manuscript is being submitted exclusively to CENJOWS for publication consideration, is original, and has not been published or submitted elsewhere. I further certify that it contains no classified, restricted, or sensitive information and is based entirely on open-source material suitable for publication in the public domain.

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