Make in India in Defence: A Reality Check

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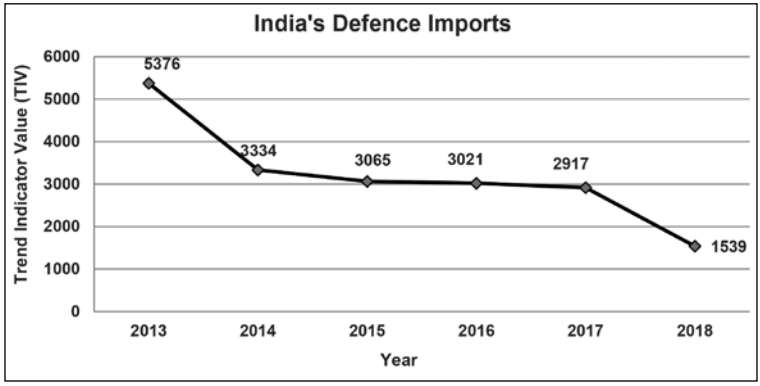
Prowess in design, development and production of weapons, equipment and munitions is a sure indicator of a country's capability and resolve to guard its national interests. It is a prerequisite for any country that aspires to have a say in global affairs, become a great power and have an enviable standing in the comity of nations. An economically strong and militarily self-reliant country evokes the envy of friends, instils caution among foes, and deters potential adversaries from misadventure, with the threat of unbearable punishment in return.

It's an irony that although India is ranked among the top 15 producers of defence hardware in the world,[1] the existing defence industrial base has not been able to meet the requirements of modern weapons, equipment and munitions of our armed forces. The drying up of assemblies and components for tanks, fighter planes and a host of other military equipment, post break-up of the erstwhile USSR, is a stark reminder of the helplessness that resulted due to heavy dependence on imported weapons, equipment, specialist vehicles and munitions. The armed forces experienced real hardship in the upkeep, repair and overhaul of imported equipment due to the low availability of spares and assemblies. Out of action sensitive equipment and the high off-road state of tanks and imported specialist vehicles forced the field units to undertake extensive cannibalisation of equipment and vehicles to retain minimum acceptable operational worthiness. It's a well known fact that critical deficiency of artillery ammunition during the Kargil War was made up by import from South Africa, amongst other nations.

India is the third largest defence weapons market in the world. Simultaneously, India also wore the unenvious crown of being the largest importer of arms (by value), that stands at 12 percent of the total global arms imports, for the five-year period from 2013 to 2017.[2] The quantum of defence imports, however, came down significantly for the years 2017 and 2018. The latest report on 'Arms Trade' by the Stockholm International Peace Research Institute (SIPRI), uploaded on the web on March 11, 2019, places India at the 4th rank, with 5.6 percent share in the global arms imports for the year 2018, behind Saudi Arabia, Australia and China among the highest importers of arms.[3] India currently imports 60 percent of its requirements of weapons and equipment under capital procurements. The country also imports nearly 50 percent of its ammunition requirements (by value), with an annual spending of more than Rs 10,000 crore on ammunition.[4]

A chart depicting India's defence products import, based on Trend Indicator Values (TIVs), accorded by SIPRI for the period from 2013-18, is as under:



Source: SIPRI arms trade data, maintained till 2018, at http://armstrade.sipri.org. The TIVs, used by SIPRI, are based on the known unit production costs of weapons and represent the transfer of military resources rather than the financial value of the arms transfers.

Currently, India is one of the select few countries with cutting edge space capabilities. The Indian Space Research Organisation (ISRO) has set the world record for placing the maximum number of satellites in orbit in one launch, yet we are unable to build indigenous modern weapon platforms and munitions for our armed forces.

Though 100 percent private industry participation in the defence sector was permitted in May 2001, progress in the field of indigenous defence manufacturing remained slow. The indigenisation process got an impetus when Prime Minister

India presently imports 60 percent of its weapons and equipment.

Narendra Modi, during his first Independence Day speech, on August 15, 2014, gave the call to convert India into a manufacturing hub. When the government launched its flagship initiative 'Make in India' to boost manufacturing in the country, the defence sector, because of its direct implication on national security, lay at the 'heart' of it.

It was expected that the shift from focussing primarily on the Public Sector Undertakings (PSUs) to simultaneously also encouraging the private industry's participation in the defence sector would set the tone to unleash the humongous potential of the private sector and transform the landscape of defence manufacturing in the country, leading to greater indigenisation and self-reliance. In line with the stated aim, the Armed Forces HQ, bureaucracy and other stakeholders got into action, which culminated in a series of consultations and proactive policy initiatives by the government.

Initiatives under 'Make in India' in Defence

Roadmap for Indigenisation and Self-Reliance in Defence: In consultation with the armed forces headquarters and all important stakeholders, a draft roadmap was prepared and refined by the government over a few months in 2014. The government came up with the roadmap for indigenisation and self-reliance in defence enlisting numerous ways to boost the private industry's participation in the defence sector.

Ease of Doing Business (EODB): Efforts to minimise the red tape and consequent bureaucratic delays and other measures to make the business environment conducive have positively impacted the country's place on the EODB index. India has jumped 23 places in the last one year and a whopping 65 places in the last four years. India is currently at 77th place in the global ranking among 190 countries.[5]

Defence Products List: The list of defence items was finalised and promulgated in 2014;[6] and further pruned down to facilitate the participation of domestic private industry in defence manufacturing. The defence products list replaced the "Wassenaar Arrangement List of Munitions"[7] that was being followed by India till its own list was promulgated on June 26, 2014. Removal of dual-use items and most components from the list opened the doors for their unrestricted manufacture by the private industry, which hithertofore needed an 'industrial licence', thus, giving a major impetus to the private sector's participation in defence.

Strategy for Defence Exports and Grant of Industrial Licences

- A defence export strategy and the Standard Operating Procedure (SOP) for grant of the 'No Objection Certificate (NOC)' were formulated, in consultation with all stakeholders, including the armed forces headquarters, and promulgated in September 2014.[8] The strategy and procedure were aimed at streamlining and facilitating defence products' export by both the public and private industries.
- The procedure for the grant of industrial licences was simplified, streamlined and the facility for 'on-line' application was introduced. A total of 353 industrial licences had been issued to the private industry till July 2018.[9]

Foreign Direct Investment (FDI) in Defence: The revised FDI policy-effective from June 7, 2016, later clarified on June 24, 2016, permitted up to 49 percent FDI through the automatic route and up to 100 percent FDI through the government route, wherever it is likely to result in access to modern technology;[10] thus, opening the doors for greater participation by foreign defence manufacturers.

Procurement from Small and Micro Enterprises (SMEs): The Public Procurement Policy for SMEs has been effective since April 1, 2012. Every Central Ministry, including the Ministry of Defence (MoD)/Department/(Public Sector Undertaking (PSU) shall set an annual target for 20 percent procurement from the SME sector. As a further proactive step, the overall procurement goal of minimum 20 percent was made mandatory from April 1, 2015. The measures include giving tender sets free of cost and exemption from payment of earnest money to registered SMEs and have been implemented. SMEs quoting a price within the price band L1 + 15 percent, when the L1 is from someone other than an SME, shall be allowed to supply at least 20 percent of the tendered value at L1 subject to lowering of the price by SMEs to L1. Some 358 items are reserved for exclusive procurement from SMEs.[11] Also, during October 2017, the Government of India mandated all major PSUs to join the Trade Receivables electronic Discounting System (TReDS) platform to facilitate payments to the Medium, Small and Micro Enterprises (MSME) vendors.[12]

Guidelines for Joint Ventures (JVs): The guidelines issued by the Department of Public Enterprises and the Finance Ministry that are applicable to all Central PSUs, will be applicable for the Defence PSUs (DPSUs) too. The government is of the view that the enhanced participation of the private industry in defence and the changes effected in the defence acquisition procedures, precluded the

need for separate JV guidelines for the DPSUs. In addition, having multiple sets of guidelines could cause confusion in the environment and was not desirable. The government, therefore, abolished the previously existing guidelines that had been notified in February 2012, for establishing JV companies by the DPSUs.[13]

Public-Private Partnership (PPP): The government has encouraged the Indian industry, both public and private, to collaborate successfully and boost indigenous design, development and manufacturing of defence equipment. PPP, including the consortium approach, has proved its ability to deliver the desired results in some notable defence projects.

Outsourcing and Vendor Development Guidelines: The outsourcing and vendor development guidelines have been formulated and implemented to encourage tiered manufacturing and participation of SMEs in defence manufacturing. The guidelines mandate that the DPSUs and Ordnance Factories Board (OFB) are required to have short-term and long-term outsourcing and vendor development plans to gradually increase the outsourcing from the private sector, including SMEs.[14] The guidelines also include vendor development for import substitution.

Defence Offset Policy: Revision of the contract value for the applicability of defence offsets has been raised to Rs 2,000 crore from the erstwhile Rs 300 crore.[15] The mechanism has been simplified, to an extent; and additional options have been made available to facilitate execution of the resultant obligation. The current policy is vendor-driven. The vendors can freely choose from a wide range of options and select their offset partners and formulate proposals to discharge their offset obligations.

Establishment of Defence Corridors: The government has decided to establish Defence Corridors, one each in UP and Tamil Nadu, for the creation the of a Defence Industrial Complex. With the setting up of these Defence Corridors, not only will defence manufacturing be operationally streamlined; these will also open up a plethora of opportunities for SMEs situated along the corridors. An entire eco-system of Tier-2 and Tier-3 suppliers is expected to come up.

Incentivising Research and Development (R&D): Introduction of 'Buy Indian Designed Developed and Manufactured (IDDM)', as a category, with the highest priority in the capital procurement procedure, will encourage investment in R&D by both public and private defence enterprises. 'Centres of Excellence' have been set up by the Defence Research and Development Organisation (DRDO) for focussed research in the defence sector. Innovations for Defence Excellence (iDEX), was launched by the government in April 2018. It primarily aims at the

creation of an eco-system to foster innovation and technology development by engaging industries, including MSMEs, start-ups, individual innovators, R&D institutes and academia. iDEX will be funded and managed by a 'Defence Innovation Organisation (DIO)'.[16] Besides, the Defence India Start-up Challenge has been launched by the government in partnership with the Atal Innovation Mission, aimed at supporting start-ups/MSMEs/innovators to create prototypes and/or commercialise products/solutions in the area of national defence and security.[17]

Transfer of Technology (ToT) by DRDO to Private Industry: The transfer of technology by DRDO to select domestic private defence industries for productionisation has given an impetus to defence manufacturing. For instance, bullet-proof helmets and jackets are being manufactured by MKU Ltd, post ToT by the DRDO.

The Exchange Rate Variation (ERV) Protection: The ERV protection, which was a long standing demand of the private industry, has been allowed on the foreign exchange component to all Indian companies, including private companies, in all categories of capital acquisitions. This is a positive step to create a 'level playing field' between the domestic and foreign industries.

Promulgation of the Defence Procurement Procedure (DPP-2016): In 2015, the MoD set up a Committee of Experts to formulate a sector specific strategy for defence, evolve a policy framework to facilitate 'Make-in-India' and bring about the necessary procedural changes to achieve the objective.[18] The committee submitted its report in July 2015. The DPP-2016 (less Chapter VII, on Strategic Partnership) was promulgated in March 2016 during the inauguration of the Defexpo by the then Raksha Mantri, Shri Manohar Parrikar.

Refining of DPP-2016: In December 2018, amendments were promulgated by the government in DPP-2016, with the aim to further streamline the procedure and reduce timelines by obviating procedural delays.[19] Some of the amendments are listed as under:

- Directions given to include details of Independent Monitors (IMs) in the Request for Proposal (RFP) for defence capital acquisitions.
- Immediately on receipt of the Trial Report in the Service Headquarters (HQ), permission to commence benchmarking of the cost.
- Doing away with the Bank Guarantee for Essential Parameters 'B', if the same are trial evaluated during the field evaluation trials.
- Legislating provisions for exchange rate variations when considering procurement with an 'option clause'.

- Providing guidelines for the imposition of the Liquidated Damage (LD) clause in upgradation/alteration cases.
- Automatic incorporation of the applicability of the latest legislation changes or amendment of any act or law, rule or regulation.
- Time period for a repeat order limited to five years from the date of completion of the warranty of final delivery in the previous contract.

Progress Achieved under 'Make in India' in the Defence Sector

The 'Make in India' initiative has been a major driver that has prompted the domestic private defence industry to play an active role in defence manufacturing. The overwhelming response of over 600 vendors of military hardware, a majority of whom represented domestic defence industry, in the Aero-Shows and Defexpos, in the last two editions, is testimony of the interest exhibited by the private sector in indigenous defence manufacturing. The industry captains have expressed on various occasions that the 'Make-in-India' initiative has been very helpful in creating a demand for indigenous solutions. Some notable aspects of the progress made in the past five years are discussed as under:

- **Effort to Kick-Start the Strategic Partnership (SP) Model:** Procurement of utility helicopters for the Indian Navy will kick-start the SP model and give a boost to the 'Make-in-India' programme in the defence sector.[20] The Indian partner will form a JV with the foreign Original Equipment Manufacturer (OEM), acquire the required technology and create manufacturing facilities within India. The long-term objective is to establish India as a defence equipment manufacturing hub, enhance indigenisation and self-reliance, set up a defence industrial and R&D eco-system that would not only cater to future requirements of the armed forces but also become part of the global supply chain.
- **Defence Exports:** Based on the No Objection Certificates (NOCs) issued by the MoD, the value of exports by all public and private defence enterprises for the year 2016-17 was Rs 1,495.27 crore.[21] The exports for the year 2017-18 were estimated at Rs 4,500 crore and are likely to cross Rs 10,000 crore for the current financial year. Approximately 15 companies in the private sector are contributing to defence exports and more are likely to join in the current fiscal year. Exports of defence products have been made to Sri Lanka, Russia, France, Nepal, Israel, Italy, Saudi Arabia, Spain, Poland, Philippines, Chile,

Bhutan, etc. Offshore patrol vessels, personal protective items like bullet-proof jacket/helmet, radars, Advanced Light Helicopters (ALHs) and coastal surveillance systems are some of the items that have been exported.

- **Defence Manufacturing**
  - **Indigenous Modern Artillery Gun System:** The development of the Advanced Towed Artillery Gun System (ATAGS, 155 mm x 52 calibres) was recently completed by DRDO. The Armament Research and Development Establishment (ARDE) partnered with the Kalyani Group, Tata Power SED and OFB for this project.[22] The gun was introduced into the Army in 2018. The government has approved the procurement of 150 ATAGS for the Indian Army at an approximate cost of Rs 3,364.78 crore.[23] During the full-scale manufacture, an entire eco-system of smaller Tier-2 and Tier-3 suppliers is expected to come up.
  - **Indigenous Version of Ultra Lightweight Howitzers (ULH) M777:** Bharat Forge has made the indigenous version of the ULH M777, one in titanium (4.5 tons) and another in steel (6.7 tons).
  - **Airframe Assembly for the Brahmos:** Godrej Aerospace won the order for 100 sets of airframes for the air-launched BrahMos missile in December 2017 and successfully delivered the first airframe assembly on August 31, 2018.[24] The public-private partnership among Godrej Aerospace, DRDO and BrahMos brings together the planning abilities of the DPSUs and innovation of the private enterprises.
  - **Assemblies and Components for Boeing Aircraft:** Currently, there are more than 160 suppliers providing assemblies and components for Boeing commercial and defence aircraft as part of an integrated global supply chain. These advanced, complex components and assemblies include aero-structures, wire harnesses, composites, forgings, avionics and ground support equipment for aircraft like the 777, 787, P-87, F/A-18 Super Hornet, F-15, etc.
  - **Individual Under-Water Breathing Apparatus (IUWBA):** The government accorded approval for the design and development of the IUWBA (fitted when carrying out deep fording to negotiate water obstacles like rivers/canals/DCBs), by DRDO Lab DEBEL, for the T-90 tanks.
  - **Short Range Missile System for the Indian Navy:** Vertically launched short range missile systems for Indian Navy ships, to boost the self-defence capability against anti-ship missiles, were approved by the government in 2018.[25]

- **International Cooperation:** The government has taken the initiative to forge international cooperation with friendly foreign countries in the defence sector. A few notable developments are discussed as under:
  - **Indo-Russian Cooperation:** India and Russia set up a high level committee on cooperation in 'high technologies', to identify concrete projects in areas of mutual interest for joint R&D. India and Russia also agreed to extend bilateral cooperation on defence JV manufacturing projects on December 13, 2018, at the 18th meeting of the India-Russia Governmental Commission on Military Technical Cooperation (IRIGC-MTC). Intensive discussions were held on joint manufacturing projects, including the Kamov-226T helicopters, naval frigates, other projects related to land systems and spares of Russian origin equipment.[26]
  - **Indo-US Cooperation:** During the Indo-US 2+2 Dialogue, emphasis was laid on the Defence Technology and Trade Initiative (DTTI) for the progressive development, designing and manufacturing in India of the equipment imported from the US. Also, a Memorandum of Intent (MoI) was signed between the US Defence Innovation Unit (DIU) and the Indian Defence Innovation Organisation-Innovation for Defence Excellence (DIO-iDEX),[27] which is likely to play a significant role in taking the defence partnership to a higher level. The initiative is likely to enable transfer of modern defence technology to India and provide a fillip to defence manufacturing under the 'Make-in-India' programme.
- **Joint Ventures (JVs):** Many steps have been taken to encourage formation of JVs between the Indian and foreign defence industries. As a result, more than 50 JVs have already been inked and some of them have commenced production activities. Some of the notable products are discussed as under:
  - **Artillery Systems**
    - Bharat Forge Elbit Advanced Systems: The JV between Bharat Forge and Elbit (Israel) for manufacturing of artillery systems, is offering solutions in the artillery guns and mortars segments.[28]
    - Bharat Forge has indigenously developed the Garuda 105 mm hybrid recoil gun, in collaboration with Mandus, a US company. The metallurgy (new hybrid technology) reduces the weight and the recoil force of the gun. The gun that can be mounted on the truck, weighs 900 kg, just 25 percent of the Indian Field Gun (IFG) which weighs 3,500 kg.[29]
  - **Components for Tanks and Missile Testers:** Under the 'Make-in-India' programme, Si2 Microsystems, in collaboration with M/s

UralVagonZavod, Russia, manufactures track links for the T-72 and T-90 tanks. The company also carries out design and manufacture of missile testers for the MBDA missile systems, France; and various micro-systems for ISRO.[30]

- **Missiles and AD Systems**
  - Larsen & Toubro (L&T) has entered into a JV with the European arms manufacturing group MBDA to supply missiles and missile systems to the Indian armed forces. L&T will hold 51 percent stake in the joint venture. Initially, the JV will focus on developing and supplying Fifth-Generation Anti-Tank Guided Missiles (ATGM5s), missiles for coastal batteries, and high-speed target drones.[31]
  - Kalyani Rafael Advanced Systems (KRAS): The Kalyani Group, with Rafael (Israel), has set up a manufacturing facility in Hyderabad (24,000 sq ft) for indigenous production of the SPIKE ATGM high-end technology systems. The JV will be engaged in the development of a wide range of advanced capabilities like missile technology, command control and guidance, electro-optics, remote weapon systems, precision guided munitions and system engineering for missile integration.[32]
- **Aero-Structures**
  - On April 12, 2018, Boeing announced a partnership with Hindustan Aeronautics Limited (HAL) and Mahindra Defence Systems (MDS) for manufacturing the F/A-18 Super Hornet in India for its armed forces and pursuing the joint development of future technologies.[33] This partnership brings the Indian public (HAL) and private (MDS) enterprises, together in partnership with the world's largest aerospace company (Boeing).
  - Tata Advisory Systems Limited (TASL): The Sikorsky JV is the first major aero-structure programme in the private sector in India; 120 plus S92 helicopter cabin assemblies have been delivered by the company.
  - The TASL-Lockheed Martin JV was established as the first programme for US defence in the country; 44 plus C130 J Empennage and 28 centre wing boxes have already been delivered to Lockheed Martin.[34]
  - Tata Boeing Aerospace Ltd (TBAL): Tata Advanced Systems, in collaboration with Boeing (a US company), became operational in July 2017 and on June 1, 2018, the company delivered, ahead of schedule, the first Apache combat helicopter fuselage from this facility.[35]

    - Dynamatic Technologies is manufacturing aero-structures, aft pylon and cargo ramp components for the H-47 Chinook helicopters. Some 75 aero-structures have already been manufactured by the company under the 'Make-in-India' programme.[36]
  - **Initiatives by the Army:** The Army took a proactive step by establishing the Army Design Bureau which has done commendable work as the facilitator for research and development efforts with industry, academia, DRDO and DPSUs to enable them to understand and appreciate user requirements in depth. Some of the initiatives of the Indian Army under the 'Make in India' programme are listed as under:
  - **Make Projects**
    - Terminal guided munitions.
    - Third generation anti-tank guided missile.
    - Augmented reality-based head mounted display system.
    - Combat freefall system.
    - Robotic surveillance platform.
    - Multi-target tracking system for tanks and several other projects.
  - **Projects Launched by the Army Technology Board in 2018**
    - Auto intelligent swarm of aerial platforms for extended surveillance.
    - Near space remotely piloted aircraft system.
    - Development of extended range ammunition using ramjet technology with precision guidance.
    - Habitation in high altitude areas and several other projects.
  - Many projects have also been pursued through the technology development fund. Lightweight bullet-proof material, exoskeletons, and load carrying drones are some of the projects that are being actively pursued by the Army.

Issues

Much progress has been made on the road to create a conducive atmosphere for the enhanced participation of the private industry in the defence sector, yet many issues remain to be resolved. Some of the issues that need to be tackled on priority are discussed as under:

- **Slow Decision-Making Process:** The process of decision-making in the MoD is very slow and has the potential to disillusion many motivated entrepreneurs. Sometimes, the process of analysis may take months and still a decision may not result. Moving cases on files tends to lead to subjectivity and interpretation

There is insignificant investment by private industry in R&D in defence sector.

at individual levels, while simultaneously causing delays in decision-making. In an interview with the *Economic Times*, SN Subrahmanyan, Deputy Managing Director and President of L&T had said that while the company is bullish on the defence sector, the pace of decision-making was "frustrating".

- **Risk Aversion for Fundamental Research:** Many players of our domestic private defence industry are risk averse to fundamental research in futuristic technologies that have potential usage in the armed forces. As a result, there is insignificant investment by the private industry in R&D in the defence sector. The defence R&D is centred primarily on the DRDO and to a limited extent, on the DPSUs. Fundamental research for development of futuristic weapons, equipment and related technologies is generally not taking place in the domestic private industry. We also need to understand that expectation of heavy investments in R&D, where the rate of failure is extremely high, would be futile. The domestic private defence industry needs hand-holding by the government to overcome its aversion for risks which also includes investment for fundamental research.
- **Low FDI in Defence Sector:** In spite of revision of the FDI policy in June 2016, the cumulative FDI in defence from 2014 onwards till December 2018 has been estimated at Rs 437 crore. One of the major reasons for the low FDI is that the foreign investors are deeply apprehensive about the safety of their investments. A delegation from Canadian government, during the interaction at the Centre for Land Warfare Studies (CLAWS) in November 2018, informed that the investment from their country in India would need assurance of protection from the Indian government. High risk and low feasibility of returns on investments are potential deterrents for foreign investors, and need to be tackled on priority. The foreign companies are also holding back investments till the time they get large committed orders that are to come under the strategic partnerships model, which has been hit by a series of delays.[37]
- **Lack of Level Playing Field:** The playing field needs to be made truly level for the domestic private defence industry. Overprotection of the public enterprises gives them unfair advantages over their competitors in the private sector, thus, dissuading their enhanced participation in the sector. Nomination of DPSUs for capital/revenue procurements, though reduced, has been continuing. The enhanced multiplication factor for ToT to DRDO,

during the discharge of offset obligations, is against the essence of a provision of a level playing field to the private sector.

- **Low Defence Exports:** There has been a noticeable increase in the export of defence products to friendly foreign countries in the last five years from 2014 onwards. As per the arms trade data released by SIPRI on March 11, 2019, India's share still stood at 0.15 percent of the global arms exports for the five year period from 2014-18, up from 0.04 percent for the period from 2009-13. However, the exports are still insignificant in comparison with our imports, in value. The issue of low defence exports needs to be addressed on priority.
- **Uncertainty:** The air of uncertainty around projects, post commencement, due to financial constraints (high cost factor, low availability of funds), slow progress or any other reason, acts as a dissuasive factor for the participation of the domestic and foreign private industries in defence. Some examples are mentioned as under:
  - **Battlefield Management System (BMS):** The project stands abandoned due to the high cost factor, when the industry had already put in a considerable amount of effort and money into the project.
  - **Future Infantry Combat Vehicle (FICV):** In the absence of any tangible movement on the project in the last one decade, the fate of the project is uncertain.
- **ToT:** The OEMs are not generally keen to share defence technology, owing to concerns about the safety of the technology and ownership issues. In July 2018, a top official of the US-India Business Council (USIBC) said that they wanted a government-to-government agreement to facilitate the transfer of classified defence technology and information to the Indian private sector besides clarity on issues relating to liability, intellectual property rights and industrial safety.[38] Besides, a think-tank from the US, during the interaction in a seminar conducted by CLAWS in 2018, categorically stated that India should look for the transfer of only 'workable technology' and not 'state-of-the art' technology. It is reasonable to assume that without critical technology transfer from the OEMs, it would be quite difficult to indigenously manufacture high end defence weapons/equipment and their major assemblies/critical components in India. Experience indicates that so far, only Russia has been prompt in sharing defence technology with India.
- **Inability to Adhere to Timelines:** The Ordnance Factories (OFs) and DPSUs, due to various constraints inherent in the system, are not able to adhere to

the contracted timelines, resulting in dissatisfaction among the armed forces. A few examples are mentioned as under:

- **Close Quarter Battle (CQB) Carbine and Protective Carbine:** Both the weapons, which were being manufactured by the OFB under ToT, did not meet the qualitative requirements. The project of the CQB carbine had commenced in 2009 while that of the protective carbine started in 2005. Problems pertaining to reliability and consistency could not be resolved in time. Absorption of technology is another grey area that the defence industry needs to look into. Due to prolonged delays, the carbines are now being imported to meet the requirements of the armed forces.
- **Induction of Tejas Fighter Aircraft:** The project started three decades ago; however, its induction in the Indian Air Force could be carried out only in 2015. Indigenous manufacture of a complex aerial weapon platform is a great achievement; however, prolonged delays in project completion have an adverse impact on the security preparedness of the country.

- **Orders to Medium, Small and Micro Enterprises (MSMEs):** Consistency in defence procurement from the MSMEs is lacking. The lack of steady flow of orders to the MSMEs, in spite of the stipulation which makes it mandatory for all ministries (including the Defence Ministry) and departments to source 20 percent of requirements from the MSMEs, may lead to disillusionment. This is a significant hurdle in the expansion of our defence industrial base.

Assessment

A candid assessment, post detailed analysis and in-depth deliberation of all the relevant aspects, reveal that the government has taken a positive decision to promote the 'Make in India' programme and exhibited strong resolve by undertaking measures to create suitable conditions for ease of doing business and encouraging the participation of the domestic private industry in defence. Many companies have been granted industrial licences for the design, development and manufacture of defence products. The production of complex assemblies, sub-assemblies and components by certain private defence companies has commenced, which is indeed a creditable and noteworthy achievement.

The involvement of the private industry at the system level, like in the case of ATAGS, is a significant leap forward, a paradigm shift and has resulted in developing a 'state-of-the-art' weapon system in a short timeframe. Guidelines for forming JVs have been amended. With the formation and commencement of production by an increased number of JVs, the contribution of MSMEs

in the manufacturing of components is likely to get a tremendous amount of stimulus. Various government agencies have become facilitators and private industry associations like the CII, FICCI, ASSOCHAM, and PHDCCI (Confederation of Indian Industry, Federation of Indian Chambers of Commerce and Industry, Associated Chambers of Commerce and Industry and PHD Chambers of Commerce and Industry) have become policy influencers. These are positive developments which will help in creating an eco-system for defence manufacturing by the private industry.

Progress is indeed visible, but it is slow; and several issues remain to be resolved. The 'Make in India' programme in the defence sector has not yet taken firm roots. Barring a few exceptions viz ATAGS, Pinaka Multi-Barrel Rocket Launcher (MBRL), Akash missile system, Dhanush artillery gun and a few other weapon systems, there is nothing much to show, in terms of manufacturing of complete complex weapon platforms, under the 'Make in India' programme. A major proportion of our defence requirements continues to be imported. The roadmap for indigenisation and self-reliance was well formulated; but implementation of the measures outlined therein has not been carried out effectively. Hence, 'Make-in-India' in defence has not yielded the desired results. There is, therefore, a strong reason to find ways to expedite our march towards indigenisation and reduce the foreign component of our weapons and equipment.

Fundamental/original research in defence technology by the private defence industry is lacking; while the involvement of the Indian Institutes of Technology (IITs) and other educational institutions is limited. There is, therefore, a need for hand-holding and stimulating R&D in defence by the private sector; and simultaneously pursuing greater involvement of the IITs and other educational institutions in fundamental/original research.

Recommendations

Some measures that are recommended to be adopted to give further impetus to indigenous defence manufacturing and development of a defence eco-system are discussed as under:

- **Prevent Stagnation in Defence Procurement:** Stagnation in defence procurement should not be permitted, as the private defence industry will not be able to sustain itself without orders from the government.
- **Focus on Quality:** The public and private industries need to focus on assuring high quality products: weapons, equipment and munitions. When the products meet quality standards expected as per the General Staff

Qualitative Requirements (GSQR), the armed forces would willingly accept the indigenously designed, developed and manufactured items.

- **Skilling, Training and Tooling:** The armed forces 'Modernisation', 'Make-in-India' and 'Skill India' initiatives are all inextricably linked. The public and private industries should select young/talented aspirants, train and skill them for the job; invest in tooling; and produce world class defence products.
- **Assure Protection to Foreign Investments:** The government needs to recognise the apprehensions of foreign investors and initiate steps to assure protection to foreign investments in the defence sector. Lack of confidence in receiving the expected returns while investing in the high risk defence sector, is one of the major hurdles on the road to enhance FDI in defence.
- **Encourage JVs:** Facilitate domestic defence industry, both public and private, to enter into JVs with foreign OEMs. The JVs are likely to bring the niche technology for advanced weapon systems, and address, to an extent, the critical needs of our armed forces. The focus of JVs should be to manufacture complex weapon platforms, equipment and assemblies for the Indian armed forces and global OEMs; and become an integral part of the global supply chain. The JVs also need to make calibrated investments in infrastructure development, enhance capacities, accelerate manufacturing processes to achieve economies of scale and incorporate internationally accepted standards of manufacturing in the facilities. This will assist in development of an indigenous defence eco-system while also enabling co-development of integrated weapon systems.
- **Level Playing Field:** A level playing field is required to be ensured, wherein the domestic private enterprises are considered at par with the DPSUs and foreign companies. Nomination of PSUs in procurement, both capital and revenue, should immediately cease. The domestic private defence companies are also discriminated against by putting onerous conditions and financial obligations which are not levied on foreign companies. The domestic private companies have to contend with an unfavourable tax structure which dissuades indigenous manufacturing and value addition. This is an undesirable situation, as domestic private companies have to slog it out to get issues resolved with the tax departments. Also, the enhanced multiplication factor in the discharge of offset obligations for ToT to DRDO, should be extended to the domestic private industry too.
- **ToT:** To allay the apprehensions about the safety of defence technology, post transfer to Indian domestic defence companies/JVs, the necessary

confidence-building measures should be undertaken. India's impeccable past record in ensuring secrecy and safeguarding of technology, should be leveraged. G to G agreements for assuring protection of coveted military technology, as expressed by the US-India Business Council (USIBC), to encourage ToT by OEMs to the domestic public and private industries, may be considered on an as required basis. The Indian defence industry should also be ready to make just payments to foreign OEMs for the technology intended to be acquired.

- **Absorption of Technology:** The domestic defence industry should be able to absorb technology and develop technology understanding to be able to manufacture defence equipment/munitions and achieve the desired quality benchmark. The weapon systems developed by the industry have to meet stringent qualitative requirements with respect to ballistics, accuracy, consistency and maintainability.
- **Encourage Fundamental Research:** For fundamental research, we need to take a cue from the US. Most modern technologies in the US were first developed for application in defence and funded by the government and later permitted for use in civil applications. On the same lines, the Indian government should provide 100 percent funding for carrying out fundamental research in technologies that have the potential for future use in the armed forces. Liberal R&D grants should be earmarked and their optimum utilisation by private industry, universities and educational institutions should be facilitated.
- **Competency Mapping:** Competency mapping should be carried out and a 'pool' of qualified vendors should be created. Limited tenders should be floated for weapon systems/equipment/munitions that involve high end technology and precision, and require complex engineering equipment and infrastructure.
- **Selection of Strategic Partners:** There is an urgent need to make the Strategic Partnership Policy functional and let the real results start showing. The exercise to select prospective Indian strategic partners should be carried out expeditiously. Till this is done, the manufacturing of aircraft, submarines, helicopters and armoured platforms will continue to get delayed. Strategic partnerships should also be considered for the development of futuristic military technology.
- **Capital Procurement:** Piecemeal changes in procurement procedures indicate an incremental approach. Evolving a pragmatic policy and refined procedure which is less complex, for defence capital procurement, is essential.

Let the procedure be simple, streamlined, easy to implement and assist the cause of indigenisation and self-reliance in defence. Time-bound progressing of cases, discipline to ensure that the procurement process gets completed effectively within one year; while simultaneously establishing accountability of the bureaucracy and financial advisers to speed up the decision-making process are the need of the hour. In the meantime, the government should speedily promulgate the changes that stand already approved, in DPP-2016.

- **Selection Parameters:** L1 should not comprise the sole criterion for selection of a company to take up critical projects for indigenisation and during capital procurements. The criterion for selection should be revised to accord due weightage to quality by following the L1T1 concept (selecting better technology, not necessarily at the lowest price). The methodology for according weightage to technology parameters that surpass the minimum qualitative requirements projected by the armed forces should be worked out in detail, without leaving any room for subjectivity and/or manipulation for pecuniary benefits.
- **Implement Public Procurement Policy for MSMEs Effectively:** The Public Procurement Policy, mandating 20 percent procurement by ministries/ departments, should be sincerely implemented for defence products (assemblies and components) too. In addition to the 358 items already earmarked for procurement from the MSMEs, more items are required to be identified and included in the list. In addition, developing MSME vendors in accordance with the 'Vendor Development Guidelines' is essential.
- **Offset Policy:** Suitable amendments to further streamline the policy with the aim to enable the OEMs to discharge offset obligations with ease, are required to be incorporated. A change in approach is recommended to enable the MoD to channelise offsets into the areas where investments are required the most to strengthen the defence industrial base in the country. The revised guidelines should empower the government to insist on investments by the OEMs under offset obligations in specific areas.
- **Exhibit Certainty in Projects** All major projects must be launched after a detailed feasibility study and cost analysis. Once a project is launched, frequent changes should be avoided and the project should be progressed to successful culmination. Uncertainty should be replaced with certainty.
- **Framework for Reforms:** A framework for comprehensive reforms to further enhance ease of doing business, FDI rules and ownership issues, etc., should be formulated and implemented expeditiously.

- **Formulate Comprehensive Strategy:** There is an immediate need to formulate a comprehensive and implementable strategy to galvanise defence manufacturing in the country. We need to adopt a 'target oriented approach' so that some tangible results start showing within a short timeframe. The government should declare that all major defence capital acquisitions from April 01, 2030 onwards will be from indigenous sources. This would definitely encourage the domestic private industry, with 'Make in India' as the core element of its business strategy.
- **Set up Defence Corridors':** Setting up of Defence Corridors needs to be expedited and made time-bound. The government also needs to ensure that these corridors should generate enough business for companies to establish manufacturing units/service facilities and sustain them—many existing companies are not able to bag defence contracts and find the going difficult.
- **Enhanced Role of Armed Forces:** The armed forces, being the ultimate users, have to take the lead in guiding the defence industry, in both the public and private sectors, in understanding the desired parameters, operational and technical requirements, and provide inputs where required to facilitate R&D of futuristic weapon platforms. The interactions between the armed forces and the defence industry should be carried out more often and an institutional mechanism evolved.
- **Assess Feasibility to Adopt Cooperative Model:** The cooperative model, if adopted in defence manufacturing, for PPP, could be a game changer. The model would entail proportional distribution of benefits/losses, collective inputs based on skills, collective decision-making and collective responsibility for success/failure. Feasibility studies for its implementation may be carried out.
- **Create Positive Atmosphere:** The government has done well to convince the industry about its good intentions. Now it also needs to assure full support to both the public and private defence industries; not only for indigenisation and R&D, but also for the export of defence products. Support to the 'Skill India' and 'Start-up India' initiatives, with a focus on the defence sector, is strongly recommended. A little extra effort will help to create a positive atmosphere and give further impetus to the domestic defence industry.

Conclusion

The Indian armed forces must get the right products (weapons, equipment and munitions), at the right time and right price, thus, ensuring maximum bang for

the buck. Indigenisation and self-reliance in defence is the only option, which will insulate the country from the likelihood of embargoes by foreign suppliers during a war and also enhance India's stature. Deep involvement in modern technology projects like the BrahMos missile programme, will contribute to strengthening of bilateral defence cooperation and, simultaneously, obviate any third party interference.

There are 'No Quick Fix Solutions'. We must build on the momentum already gained, bring in more liberalisation to encourage domestic private defence industry and focus on the establishment of a vibrant military-industrial complex. Shedding of the myopic vision and adoption of a transformational shift in approach, with an emphasis on effective implementation of the 'Make in India' programme in defence is required, so that the policy percolates down to the level where the industry, the armed forces and the bureaucracy actually interact. The translation of measures into real results must be monitored so that the benefits accrue to the private industry. Bold decisions, effective implementation and involvement of the armed forces and all other stakeholders can actually turn around the Indian defence industry and make the country a defence manufacturing hub.

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