CHALLENGES & WAY FORWARD FOR INVIGORATING PRIVATE SECTOR PARTICIPATION IN DEFENCE TO ACHIEVE ATMANIRBHARTA IN DEFENCE

Dissertation Submitted to the Panjab University, Chandigarh for the award of degree of Master of Arts in Public Administration and Public Policy, in partial fulfillment of the requirement for the Advanced Professional Programme in Public Administration (2024-25

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INDIAN INSTITUTE OF PUBLIC ADMINISTRATION

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CERTIFICATE

I have the pleasure to certify that Brig Raj Narain Tewari has pursued his research work and prepared this dissertation titled 'Challenges & Way Forward for Invigorating Private Sector Participation in Defence to Achieve Atmanirbharta In Defence' under my guidance and supervision. The dissertation is the result of his individual research and to my best of my knowledge and belief, no part of it has earlier comprised any other monograph, dissertation or book. This is being submitted to the Panjab University, Chandigarh, for the award of Master of Arts in partial fulfillment of the requirement for the Advanced Professional Programme in Public Administration (APPPA) (2024-25).

I recommend that the dissertation of Brig Raj Narain Tewari is worthy of consideration for the award of Master of Arts of Panjab University.

Dated: 28th March 2025
Place: New Delhi

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25th March 2025 Brig Raj Narain Tewari

DISCLAIMER

The findings, interpretations, views, and conclusions in the dissertations are those of the author and should not be attributed in any manner to any authority, organization or individual.

25th Mar 2025 Brig R N Tewari

LIST OF ABBREVIATIONS

Abbreviations	Full Form
A&D	Aerospace and Defence
ABW	Army Base Workshop
ADB	Army Design Bureau
AIP	Approval-in-Principle
ANOVA	Analysis of Variances
AON	Acceptance of Necessity
BEL	Bharat Electronics Limited
BEML	Bharat Earth Movers Limited
BRD	Base Repair Depot
CAG	Comptroller and Auditor General
CFA	Competent Financial Authority
CIMD	Centrally Indigenisation and Manufacturing Depot
CNC	Commercial Negotiation Committee
CVC	Central Vigilance Commission
DA	Development Agency
DAP	Defence Acquisition Procedure
DARPA	Defence Advanced Research Projects Agency
DcPP	Development cum Production Partner
DDP	Department of Defence Production
DGAQA	Directorate General of Air Quality Assurance
DGQA	Directorate General of Quality Assurance
DIB	Defence Industrial Base
DIC	Defence Industrial Corridor
DIO	Defence Innovation Organization
DISC	Defence India Start-up Challenge
DMA	Department of Military Affairs
DOD	Department of Defence
DOI	Directorate of Indigenization
DPEPP	Defence Production & Export Promotion Policy
DPM	Defence Procurement Manual
DPP	Defence Procurement Procedure
DPSU	Defence Public Sector Undertaking
DRDO	Defence Research & Development Organisation
EME	Electronics and Mechanical Engineers
EODB	Ease of Doing Business
EOI	Expression of Interest
EOQ	Economic Order Quantity
FICV	Futuristic Infantry Combat Vehicle
FDI	Foreign Direct Investment

FGHA	Fifth Generation Fighter Aircraft
FOEM	Foreign Original Equipment Manufacturer
GDP	Gross Domestic Product
GoI	Government of India
G2G	Government to Government
HAL	Hindustan Aeronautics Limited
IA	Indian Army
IAF	Indian Air Force
IC	Indigenous Content
IC&ID	Indigenous Content & Indigenous Design
IDDM	Indigenously Designed, Developed and Manufactured
iDEX	Innovations for Defence Excellence
IGA	Inter-Government Agreement
IGDMP	Integrated Guided Missile Development Programme
IL	Industrial License
IN	Indian Navy
IP	Intellectual Property
IPR	Intellectual Property Rights
IT	Information Technology
JV	Joint Venture
LI	Lower Cost
LCA	Light Combat Aircraft
LRSAM	Long Range Surface to Air Missile
MRSAM	Medium Range Surface to Air Missile
MICS	Military Industrial Complexes
MIDHANI	Mishra Dhatu Nigam Limited
MoD	Ministry of Defence
MoF	Ministry of Finance
MSME	Micro, Small and Medium Enterprises
MTA	Multi Role Transport Aircraft
NCNC	No Cost No Commitment
NITI	National Institution for Transforming India
NOC	No Objection Certificate
OEM	Original Equipment Manufacturer
OFB	Ordnance Factory Board
OF	Ordnance Factory
PI	Best Performance
PLA	People’s Liberation Army
PIB	Press Information Bureau
PIL	Prohibitionary Import List
PNC	Price Negotiation Committee
R&D	Research and Development
RFP	Request for Proposal
RQ	Research Question
S&T	Science & Technology

SCOT/SWOT	Strengths, Challenges/Weaknesses, Opportunities and Threats
SHQ	Services Headquarter
SIDM	Society of Indian Defence Manufacturers
SIPRI	Stockholm International Peace Research Institute
SME	Subject Matter Expert
SOE	State Owned Enterprise
SOP	Standard Operating Procedure
SPM	Strategic Partnership Model
SQR	Services Qualitative Requirement
TDF	Technology Development Fund
TESD	Terminal End Secrecy Device
ToT	Transfer of Technology
TRL	Technology Readiness Levels

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ABSTRACT

1. The concept of Atmanirbhar Bharat (Self-Reliant India) has emerged as a crucial policy framework aimed at reducing India's dependence on foreign imports and fostering indigenous capabilities across various sectors, particularly in defence manufacturing and research & development (R&D). Announced in 2020, this vision is a continuation of earlier initiatives such as Make in India and is designed to propel India towards economic resilience, technological innovation, and strategic autonomy. This dissertation critically examines the policy framework, challenges, and future roadmap for achieving self-reliance in the defence sector by increasing private sector participation.

2. India has one of the world's largest armed forces and has historically relied heavily on foreign Original Equipment Manufacturers (OEMs) for defence acquisitions. This dependence has led to operational vulnerabilities, particularly during periods of crisis when foreign suppliers may not provide the necessary logistical and technological support. To address this, India has undertaken significant policy reforms aimed at boosting domestic defence R&D and manufacturing. However, despite the introduction of policies such as the Defence Acquisition Procedure (DAP 2020), the Strategic Partnership Model, and the Defence Production and Export Promotion Policy (DPEPP 2020), private sector participation remains limited due to regulatory challenges, financial constraints, and an uneven playing field favoring Defence Public Sector Undertakings (DPSUs).

3. A major thrust of this dissertation is to analyze the impact of these policy initiatives and their effectiveness in transforming India's defence manufacturing ecosystem. While the government has taken proactive steps such as increasing Foreign Direct Investment (FDI) limits, establishing Defence Industrial Corridors, and promoting initiatives like Innovation for Defence Excellence (iDEX), these measures have not yet resulted in significant technological breakthroughs or a robust private sector ecosystem. The research finds that funding issues, lack of

infrastructure, inadequate R&D collaboration between public and private entities, and delays in procurement continue to hinder progress towards self-reliance.

4. A comparative analysis with global best practices in defence industrialization, particularly from countries like the United States, Israel, South Korea, and Russia, highlights the need for a more dynamic approach. The United States, for example, has successfully integrated its private sector into the defence ecosystem through robust funding mechanisms, R&D incentives, and a streamlined procurement process. The Israeli model, with its emphasis on innovation-driven military technologies and close civil-military collaboration, offers valuable lessons for India. Similarly, South Korea’s rapid transition from a defence importer to a net exporter underscores the role of strategic state intervention and effective policy execution.

5. The dissertation further explores the structural barriers limiting the private sector's role in India’s defence ecosystem. The monopsony nature of the Indian defence industry, where the government is the sole buyer, creates procurement and investment uncertainties for private enterprises. The dominance of DPSUs, coupled with restrictive technology transfer policies, limits competition and innovation. Additionally, India's defence procurement processes remain complex, leading to inefficiencies in acquisition timelines and project execution.

6. This research also delves into the impact of specific government initiatives aimed at enhancing self-reliance. The Technology Development Fund (TDF), aimed at supporting MSMEs and start-ups, has yet to yield substantial results due to funding limitations and bureaucratic hurdles. The Positive Indigenization List, which mandates procurement of certain defence items from domestic manufacturers, is a step in the right direction but lacks a robust monitoring mechanism to ensure compliance and effective execution. The Defence Industrial Corridors in Uttar Pradesh and Tamil Nadu, envisioned as hubs for indigenous defence manufacturing, require greater investments in infrastructure and incentives for private players to become globally competitive.

7. A key recommendation emerging from this study is the need for policy recalibration to enhance private sector participation in defence R&D and manufacturing. Firstly, the government must adopt a more industry-friendly approach by ensuring a level playing field between DPSUs and private firms. Secondly, the establishment of dedicated funding mechanisms, such as a Defence Innovation Fund, could help bridge financial gaps for private enterprises. Thirdly, strengthening academia-industry linkages and fostering collaborations with foreign partners through Joint Ventures (JVs) can accelerate technology absorption and domestic production capabilities.

8. Another critical recommendation is the need for a streamlined procurement process that reduces delays and enhances transparency. The current procurement system, with its complex layers of approvals, discourages private sector investments. Simplifying the Defence Procurement Procedures, ensuring faster decision-making, and increasing the predictability of contracts would encourage greater private sector engagement.

9. The study also underscores the importance of developing indigenous research capabilities in emerging technologies such as Artificial Intelligence (AI), cyber warfare, and unmanned aerial systems. Without significant investment in these areas, India risks falling behind in modern warfare capabilities. A strategic roadmap for Atmanirbharta in defence must therefore integrate advancements in disruptive technologies to maintain a competitive edge.

10. In conclusion, while India has made considerable strides in promoting self-reliance in the defence sector, much remains to be done. The success of Atmanirbhar Bharat in defence hinges on the ability to foster a dynamic and competitive industrial ecosystem that effectively integrates private sector innovation with national security objectives. This dissertation provides a detailed policy analysis and proposes actionable recommendations to ensure that India transitions from being one of the world's largest defence importers to a leading defence manufacturer and exporter in the years to come.

CHAPTER 1

INTRODUCTION

1. In the year 2020, the Hon'ble PM raised a clarion call to the nation giving a kick-start to the '*Atmanirbhar Bharat Abhiyan*[1]' (Self-Reliant India Campaign); one of the most ambitious visions, articulated as contemporary policy guideless. This clarion call succeeded the 'Make in India Initiate[2]' another visionary initiative rooted for economic growth of the nation. Atmanirbharta is following a range of reforms; the concept aims to propel India towards economic reliance, technological innovation, and strategic autonomy. In principle, the vision is all about understanding India's present and creating a new India, based on the learnings from the past. Atmanirbharta has a very special relevance for the nation's Armed Forces; maintaining the political and diplomatic aspiration of strategic autonomy with economic development and prosperity.

2. Indian forces, the second largest in the world, have long been the leading importers of military equipment (SIPRI). Dependence on foreign OEMs for our defence needs, along with their lack of assurance in providing maintenance for our weapon platforms especially during periods of national emergency critically affects our war-waging potential. The only enduring solution to address our national security needs is 'Self-Reliance in Defence R&D and Manufacturing'.

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[1] The clarion call of 'Aatma Nirbhar Bharat Abhiyan' or 'Self-reliant India' was given by Prime Minister Narendra Modi on 12 May 2020. Five pillars of 'Aatma Nirbhar Bharat Abhiyan' are Economy, Infrastructure, System, Demography and Demand. Progress report on implementation package by Ministries of Finance & Corporate Affairs has been issued by Press Information Bureau (PIB) on 13 Sep 2020. It is available a https://pib.gov.in/PressReleasePage.aspx?PRID=1653725.

[2] The "Make in India" initiative was launched by Prime Minister Narendra Modi on September 25, 2014, with the aim of promoting India as a global manufacturing hub [1] [2]. The initiative focused on 25 sectors, including defense, aerospace, and automotive, to boost domestic production and attract foreign investment [1].

3. Atmanirbharta should not be viewed from a narrow perspective of industrial manufacturing or product development. While ‘Make in India’ encourages the Make part, Atmanirbhart focuses on the conceptualisation of a product i.e. achieving sovereignty over the development cycle of a product from conceptualisation to development, its marketing, its exploitation, upgrade and eventual replacement with yet another technologically superior product. In short, it calls for a near revamp of the overall system to enhance Indian capacity and capabilities.

Atmanirbharta in Indian Military – Change of Mindset

4. Our Armed Forces are currently heavily reliant on large amounts of foreign equipment, which will continue to remain in service for many more years. Also, today our strategies, doctrines and TTPs are heavily drawn from Western war-fighting concepts. The dependence on foreign products, platforms, technology and borrowed war-fighting concepts cannot be the foundation for a militarily strong India. The imported weapon systems and war-fighting concepts in times of crisis may not work optimally and also may deny us and deprive us of the very element of surprise.

5. Accordingly, there is no alternative but to evolve and develop confidence in our abilities and develop requisite capabilities. It is more of a ‘battle of ‘minds’ and ‘mind set’ change than physical capabilities. At the conceptual level we need to evolve our war strategies/doctrines and warfighting concepts in consonance with our unique national security requirements, while giving continuous impetus to achieve self-reliance by indigenous defence R&D and production of defence equipment.

6. The vision of Atmanirbhar Bharat is not only to develop capabilities for import substitution but make the defence sector a significant contributor to the country’s economy; by enhancing defence R&D and production infrastructure, enhance human resource capital, achieving technological modernisation and developing resilient global supply chain networks. India’s Military Industrial Complex (MIC) both its R&D and defence manufacturing eco-system, needs to

come up to a level, wherein, JVs/ IGAs with foreign governments/ FOEMs should be a matter of choice rather than compulsion. Most of the JVs/ IGAs undertaken by us today are out of compulsion due to the lack of technology available within the country and this needs to change.

Defence R&D and Manufacturing: Importance

7. Military technology by nature is complex field with a huge gestation period. With the influx of disruptive niche technologies, the technology landscape has become even more complex. The rate of obsolescence of the technologies has become faster and in case not anticipated and alternative technologies worked upon well in time, it would be difficult for most of the nations to do the catching up game resulting in continued reliance on imports. Therefore for India to become truly self-reliant in defence sector, it would require a whole of the nation approach with every entity contributing towards creating an enabling environment to encourage active participation by both the public and private sector enterprises.

8. Defence Manufacturing involves primarily three stages i.e. R&D, Trial and Testing and Production thereafter. One of the significant challenges faced by the Indian defence industry is the lack of a robust (R&D) ecosystem and the requisite Trial and Testing infrastructure. Atmanirbharta or Self- reliance in the defence sector will essentially mean having sovereignty over defence products from R&D to production. A large number of initiatives by the GoI are underway; however, there is still a long way to go. We need to bring up our defence industrial ecosystem to a level where we not only become self-reliant but also develop the capability to export defence equipment to the world. Moreover, the mere size of our Armed Forces makes economic sense to produce defence equipment within the nation. The defence manufacturing ecosystem needs to transform from ‘World Dependant’ to ‘Self Dependant’, particularly in the areas of cutting-edge technologies and capability to develop and manufacture advanced weapon platforms and systems.

9. For self-reliance to flourish, we have to look at two important facets of ownership or capability and capacity. The three distinct levels of ownership

existing in our country comprise the R&D organisations like DRDO which through their various labs have the mandate for developing and fielding systems to address the requirements of our Armed Forces. At the second level, are the defence PSUs followed by the Private Sector which provides the industrial capability and capacity for production. Academia comprises the next level since it provides the intellectual base driving innovation. The latter also augment the R&D capability of the DRDO. Of late, a large number of initiatives have been launched by the government in the form of iDEX challenges, TDF and Make projects duly sponsored by funding to incubate the culture of innovation. For projects to be successful, the ownership must permeate through all three levels with synergised efforts. This synergy must drive the projects right from the conceptual stage, through R&D, production and trials, right until the final acceptance and deployment of the systems by the user.

10. The next important requirement is the capacity for indigenous R&D and defence production. For a long time our R&D efforts were largely limited to public sector i.e. DRDO and defence PSUs, however, with the promulgation of the latest policies for defence production, Defence Acquisition Procedure and revised Defence Offset Guidelines, long overdue emphasis on proactive engagement of the private sector has been clearly demonstrated.

Enhancing Private Sector Participation in Defence

11. Today, the bulk of defence production is undertaken by DPSUs, amounting to almost 80%. The contributing share of private industry towards the defence manufacturing ecosystem is just about 20%. To enhance Defence R&D and defence manufacturing and to align our defence industry with international standards, there is a need to invigorate private industry. This is also the right time to improve defence manufacturing capability, due to the ongoing Ukraine-Russia conflict as buyer nations are scouting markets which can support Russian-origin inventories. Therefore, the scope of self-reliance and Indigenisation needs to be seen not only from the perspective of self-reliance but also in India becoming a net exporter of defence equipment and associated services.

12. Limited private sector participation in defence production was allowed till 2001. The Group of Ministers (GoM) Report of 2001 recommended laying down long-term policies & planning to boost indigenous production. The Kelkar Committee (2005) recommended further opening up of defence production to domestic and foreign private sector to build a strong indigenous manufacturing eco-system. Rama Rao Committee (2008), Sisodia Committee (2009), the Committee of Experts under Mr Dhirendra Singh in 2015 and the Ranbir Singh Committee Report on Technological Modernisation have all underlined the deficiencies of the present system and have highlighted the need for an unambiguous self-reliance policy. They all have strongly emphasised the paramount importance of the participation of private industry in defence R&D and manufacturing.

Statement of the Problem

13. The defence sector is a monopsony; Govt is the only buyer. In the Indian context, the Government is also the policy maker, regulator, developer (DRDO), Certification and QA Authority {CEMILAC, DGAQA, DGQA etc.) and Producer (DPSUs). Private industry opines that Govt competes with its private industries. Developed countries, that now have strong Military Industry Complexes (MICs), supported local industries extensively (and continue to do so despite being in the top 5 ranks) by way of R&D funds and orders. Post WW II, MICs were restructured and re-aligned towards majority ownership by the private sector. The majority of the top 100 defence companies have private ownership, with minimal Govt share. In India, defence sector was opened for private sector participation only in 2001. Two decades, down the line, it remains a junior partner, contributing barely 20% of domestic production (but 85% share in exports).

14. The GoI has initiated various policy actions to boost indigenous design, development and manufacture of defence equipment to enhance private sector participation; however, these policies have not provided the necessary traction to the private industries. To summarize, the current ecosystem is characterized by: -

(a) Low levels of private sector investment in defence R&D.

(b) Non-level playing field for private industry vis-à-vis public sector entities.

(c) Limited collaboration between private companies and government R&D.

(d) Inadequate infrastructure and skilled workforce.

(e) Complex and opaque defence procurement policies.

(f) Low participation of private players in defence industrial corridor.

(g) Lack of assured orders.

(h) Security concerns and intellectual property rights issues.

15. As a result, India's defence industry base remains heavily reliant on imports, and the country's self-reliance goals in defence R&D and production remain unfulfilled. Therefore there is a need to study the constraints and how effective and user-friendly are the existing policies and guidelines enunciated by Govt of India to enhance private sector participation. What are the improvements/changes in policies which are required for creating a robust R&D and defence production eco-system and enhancing private sector participation to achieve Atma-nirbharata in defence.

Purpose or Objectives

16. **Primary Objective**. To suggest suitable changes in the current policy framework to leapfrog private sector participation in defence R&D and manufacturing, enabling India to achieve self-reliance in the defence sector.

17. **Secondary Objectives**.

(a) To identify and analyze the policy-related barriers and challenges faced by private sector companies in participating in defence R&D and manufacturing.

(b) To examine global best practices in promoting private sector participation in defence R&D and manufacturing.

(c) To suggest guidelines for simplifying procurement procedures, reducing bureaucratic hurdles, and enhancing collaboration between public and private sectors.

(d) To propose incentives and benefits for enhanced private sector participation in defence R&D and manufacturing.

Rationale and Justification

18. **Rationale**.

(a) India's defence industrial base is critical to its national security and self-reliance goals.

(b) Private sector participation is essential to achieving these goals, as it can bring in new technologies, innovation, and efficiency.

(c) Despite efforts to increase private sector participation, the current ecosystem is characterized by significant barriers and limitations.

(d) This dissertation aims to address this knowledge gap by investigating the barriers to private sector participation and identifying strategies/ policy framework/ guidelines to invigorate private sector participation in the defence industrial eco-system.

19. **Justification**. The dissertation addresses a critical and timely issue in India's defence sector, with significant implications for national security and self-reliance. The research will contribute to the development of a comprehensive understanding of the barriers to private sector participation in defence R&D and manufacturing. The findings of the dissertation will provide valuable insights and recommendations for policymakers, industry stakeholders, and researchers. The research will also contribute to the development of a framework for enhancing private sector participation in defence R&D and manufacturing. Some other aspects are as under :-

(a) The research is justified as it addresses a critical gap in the existing literature on private sector participation in defence R&D and manufacturing.

(b) The research is timely and relevant, given the Indian government's emphasis on increasing private sector participation in defence production."

(c) The research has significant implications for national security and self-reliance, making it a critical area of study.

Research Questions

20. Following are the research questions:-

(a) To what extent do the government policies on enhancing private sector participation in the defence industry ecosystem contribute in realising the objectives?

(b) What are the systematic barriers to private sector participation in defence R&D and manufacturing in India?

(c) What are the challenges faced by private sector companies in participating in defence R&D and manufacturing?

(d) What strategies and policy initiatives by Govt can be employed to invigorate private sector participation in defence R&D and manufacturing?

21. **Research Strategy.** Qualitative Research Strategy.

(a) **Exploratory Research**. To gain insights into the current state of private sector participation in defence R&D and manufacturing in India.

(b) **Analytical Research**. To examine the barriers and challenges faced by private sector companies and identify best practices globally.

(c) **Evaluative Research**. To assess the effectiveness of existing policies and initiatives promoting private sector participation and suggest suitable changes in the current policy framework.

22. **Research Design**. Interviews, case studies, and focus group discussions to gain in-depth insights.

(a) **Sequential Design.**

(i) **Phase 1**. Exploratory research to identify key issues and areas of focus.

(ii) **Phase 2**. Analytical research to examine barriers and challenges to private sector participation.

(iii) **Phase 3**. Evaluative research to assess policy effectiveness and suggest measures to enhance private sector participation.

(b) **Case Study Approach**. In-depth examination of best global practices of successful private sector participation in defence R&D and manufacturing.

(c) **Sampling Strategy**.

(i) **Purposive Sampling**. Selecting participants with expertise and experience in the defence sector.

(ii) **Snowball Sampling**. Identifying additional participants through referrals.

(d) **Data Collection Methods**.

(i) Interviews (in-person, phone, or video).

(ii) Case studies.

(iii) Focus groups including group discussions.

(iv) Secondary data analysis (literature review, policy documents).

23. **Interaction with Subject Matter Experts (SMEs)**. Alongside the review of digital platforms, extensive interactions were carried out with the following stakeholders and SMEs to gain deeper insights into the existing systems and

policy framework. These interactions were held during the last six months in the form of group discussions, personal interactions and telephonic conferencing. The details of these interactions are given in Table 3.1

Ser No	**Organisation /Stakeholder /SMEs**	**Mode**
i	MoD/DDP, DGQA & DGAQA	Personal Interaction
ii	MoD/ DMA/ HQ IDS/ Directorate of Indigenisation	Group Discussions
iii	Directorate of Indigenisation of Services ie Army, Navy and Air Force	Group Discussions
iv	Society of Indian Defence Manufacturers (SIDM) along with Industry representatives from Larsen & Toubro Ltd, Tata Advanced Systems Ltd, Reliance Defence Ltd, Mahindra Defence Limited, Ashok Leyland Defence Systems, Bharat Forge Ltd and Data Patterns (India) Pvt Ltd.	Group Discussions
v	Federation of Indian Chambers of Commerce Industry (FICCI)	Group Discussions
vi	Officials / Scientists from DRDO	Personal interaction
vii	Officers Dealing with DIC in MoD and officials from Defence Industry Corridor UP	Personal interaction

Table 3.1 Interaction with SMEs (Source :Author)

24. Detailed notes were taken during these interactions to further enhance the understanding on the impact of policies towards private sector participation in the defence industry ecosystem. The discussions were held in a free-flowing manner. These discussions allowed the author to develop a deeper understanding of

government policies aiding in private sector participation, the current impact of these policies and understand the barriers and challenges towards private sector participation in defence R&D and manufacturing ecosystem. Also, the concerns raised by the private sector were deliberated with policymakers and responses were compiled to arrive at pragmatic recommendations.

25. All individuals interviewed for this research have been guaranteed anonymity to ensure the confidentiality and privacy of their responses. As such, their names, titles, and affiliations have been withheld from this report. Quotes and insights shared by these individuals are attributed to their respective roles or designations, without revealing their identities. This measure has been taken to respect the trust placed in the researcher and to protect the participants' privacy.

Scope /Limitations

26. The research limits itself towards evolving a comprehensive policy framework to leapfrog private sector participation in defence R&D and manufacturing, enabling India to achieve self-reliance in the defence sector. An attempt will be made to analyse various Govt policies / schemes and its impact in quantitative terms using secondary data available on MoD websites to understand the real impact in enhancing private sector participation in defence R&D and manufacturing. Since the subject matter pertains to defence sector, therefore, the restriction of access to data will be a constraint. Only unclassified data and information available on open forums will be used.

Chapterisation Scheme

27. The Chapterisation scheme is as under :-

(a) **Chapter 1: Introduction**. Background and context, Statement of the problem, Research objectives and scope, Research methodology, Rationale and justification and structure of the study.

(b) **Chapter 2: Literature Review.** Historical Perspective of development of Defence Ecosystem in the country, Government Policies to enhance private sector participation and an Overview of private sector participation in defence R&D and manufacturing ecosystem- A status check.

(c) **Chapter 3: Analysis of Current Policy Framework**. Review of current Indian policies for defence R&D and manufacturing and the impact thereof, identification of barriers and challenges in the current policy framework.

(d) **Chapter 4: International Best Practices**. International best practices in the defence R&D and manufacturing of major developed nations to suggest/recommend these in the Indian context.

(e) **Chapter 5: Suggestions/ Recommendations to Current Policy Framework for Leapfrogging Private Sector Participation.** Suggestive changes/ recommendations to the current policy framework for promoting private sector participation in defence R&D and manufacturing.

(f) **Chapter 6: Conclusion and Recommendations**. Summary of Key Findings, Recommendations for policymakers and other relevant stakeholders.

CHAPTER 2

LITERATURE REVIEW

1. An extensive review of books, articles, government policies etc was carried out to explore the existing system/ policies in vogue that facilitate towards enhancement of private sector participation in indigenous defence R&D and manufacturing ecosystem. In the recent past, a large number of government initiatives and policy changes in the defence acquisition process have been carried out to enhance private sector participation. Therefore, the focus was more on the literature of the last couple of years.

2. Limited private sector participation in defence production was allowed till 2001. The Group of Ministers (GoM) Report[3] of (2001) recommended laying down long-term policies & planning to boost indigenous production. The Kelkar Committee[4] (2005) recommended further opening up of defence production to domestic and foreign private sector to build a strong indigenous manufacturing eco-system. The Rama Rao Committee [5] (2008), the Sisodia Committee (2009), the Committee of Experts under Mr Dhirendra Singh (2015) and Ranbir Singh Committee on Technological Modernisation (2021) have all underlined the deficiencies of the present system and have highlighted the need for an

[3] The Group of Ministers (GoM) report in 2001 on defence was a comprehensive review of India's national security system. The report, titled "Reforming the National Security System," was presented to the Prime Minister on February 26, 2001 [1].

[4] The Kelkar Committee, officially known as the "Committee on Defence and National Security," was formed in 2004 under the chairmanship of Vijay Kelkar, a renowned economist and former Finance Secretary. The Kelkar Committee report's recommendations had a significant impact on India's defence and national security reforms.

[5] The Rama Rao Committee, officially known as the "Committee to Review the Defence Procurement Procedure (DPP)," was constituted in 2008 under the chairmanship of Shri P. Rama Rao, a former Secretary of Defence Production.

unambiguous self-reliance policy and enhanced private sector participation. They all have strongly emphasised on the paramount importance of the participation of private industry in defence R&D and manufacturing. **Paneerselvan, P. (2016)** 'Restructuring Indian defence Industry: Enhancing the Role of Private Sector' has brought out monopoly and inability of DPSUs to attain self-sufficiency even from licensed production. It has been recommended time and again by various defence committees, defence analysts and authors to enhance the role of the private sector and also that the public sector act as a catalyst in developing the private sector.

3. **Behera (2016)** brings out that despite having a vast industrial base, India is the only country which imports most of its armaments. He identifies the key inadequacies of the Indian Defence Industry and suggests a comprehensive roadmap for the success of 'Make in India" program in defence production. He defines defence industrialization process in India in the following five distinct phases:-

(a) **Phase 1 (1947 to Mid-1960):** The Quest for Self-Sufficiency. The state played an active role in industrialisation and economic development. The public sector had an exclusive right in the defence sector. Key defence industries included 18 Ordnance Factories inherited from the British regime, Bharat Electronics Limited (BEL), established with French assistance, and the Hindustan Aircraft Factory, set up by industrialist Walchand Hirachand in 1940 and brought under the control of the Ministry of Defence in 1951. The Defence Research and Development Organisation (DRDO) was established in 1958, but research and development allocations were only 1% of the defence budget. India focused on competitive manufacturing but did not possess the capability to manufacture complex weapon systems.

(b) **Phase 2 (Mid 1960s to Mid 1980s)- Self-Sufficiency to Self-Reliance**. 11 OFs and two DPSUs Mishra Dhatu Nigam Limited (MIDHANI and Bharat Earth Movers Limited (BEML) were set up. License production of MiG-21 aircraft, tanks, destroyers etc. was taken up with Soviet collaboration.

(c) **Phase 3 (Mid 1980s to Early 2000s)- Self-Reliance through Coproduction**. R&D was given a push and Integrated Guided Missile Development Programme (IGMDP) and Light Combat Aircraft (LCA) projects were sanctioned in 1983. A Joint Venture (JV) was set up with Russia in 1998 for the coproduction of supersonic cruise missile BrahMos. Two more Inter-Government Agreements (IGAs) were signed with Russia in 2007 for co-development and co-production of Muti Role Transport Aircraft (MTA) and Fifth Generation Fighter Aircraft (FGFA). Development programmes for Long & Medium Range Surface to Air Missile (LRSAM & MRSAM) were signed with Israel.

(d) **Phase 4 (Mid 2000s to Late 2014)- Self Reliance through Private Sector Participation**. In early 2000, 100% participation of the private sector was allowed in the defence sector. Offset Clause was announced in the year 2005 for contracts exceeding Rs 300 Crore to plough back 30% of foreign exchange component to Indian Defence Companies. Make Category was incorporated in DPP-2006 and DPP-2013 gave higher priorities to indigenous defence production as Buy (Indian), Buy & Make (Indian), Make (Indian), Buy & Make and Buy (Global) in that order. Armed Forces were required to give justification if not going for higher or indigenous-centric categories.

(e) **Phase 5 (Late 2014 Onwards)- Self Reliance through Make in India Initiative**. Make in India initiative was launched in 25 diverse sectors including the defence sector with greater political and bureaucratic will. A set of measures were announced to support private sector and promote defence exports.

4. 'Atma Nirbhar Bharat (ANB) Abhiyan' or 'Self Reliant India Campaign' launched by Prime Minister Narendra Modi in 2020 is a continuation of GOI efforts to promote self-reliance. Some of the important initiatives and measures taken by

the Govt of India as available on MoD website (**Reforms in defence sector: Propelling private sector participation [6](2024)**) are as under: -

(a) The revision of Defence Acquisition Procedure, promulgated as DAP-2020, has been one of the major changes, which has brought conceptual, structural and procedural reforms in the acquisition procedure by Armed Forces. DAP-2020 prioritizes the acquisition of Indigenous Design, Developed and Manufactured (IDDM) Products. It also offers simplified procedures for the acquisition of products/ technologies, developed under iDEX and Make-II routes.

(b) On the revenue side, Defence Procurement Manual, which deals with procurement for sustenance, has been revised and is in the final stages of approval. To promote indigenisation, a separate chapter 'Promoting Self-reliance through Innovation and Indigenisation' has been added to the revised DPM-25.

(c) Dedicated 'Innovation and Indigenisation Organisations' as well as 'Design Bureaus' have been established within Service Headquarters to nurture and promote self-reliance.

(d) 75% of the total procurement budget for FY 2024-25 has been set aside for domestic defence manufacturers.

(e) 25% of the R&D budget has been earmarked for the Private Industry to encourage defence R&D. To bolster self-reliance, DRDO, DPSUs, MSMEs and Private Industries are being encouraged to enter into JVs/ SPVs with foreign OEMs for the manufacture of defence equipment in India.

(f) A drive for identification and indigenisation of all high-value complex spares through domestic Indian industry is underway. Towards this, the online web portal – 'Srijan' is being effectively utilised.

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[6] Reforms in India's defence sector have been gaining momentum, with a focus on propelling private sector participation. In 2024, the government allocated ₹6,21,941 crore for defence, with a significant portion dedicated to modernization and indigenous production [1].

(g) The Defence Industry Corridors (DICs) offer a major opportunity to boost our defence manufacturing capability, and the way these DICs shape up in future will define our overall Defence Industry Ecosystem. Two DICs have already been established in Uttar Pradesh and Tamil Nadu.

(h) Simplification of Defence Licensing Procedure is being achieved through rationalization of Defence Product List, exemption from licensing of those Parts & Components that have already been de-licensed and through increase of Validity period of license from 3 years to 15 years.

(j) The government has announced FDI of up to 74 percent through the automatic route and even beyond 74 percent upto 100 percent to be permitted through the government route, which may prove as a game-changer.

(k) Under the Make category with Govt funding, Services are actively pursuing 149 projects through co-development with the Indian Defence Industry, including MSMEs and Start-Ups.

(l) The GoI has started the Innovation for Defence Excellence (iDEX) program with an aim to create an ecosystem to foster innovation and technology development in Defence and Aerospace by engaging startups, MSMEs, individual innovators, R&D institutes & Academia. Since inception of iDEX in 2018, so far, a total of 440 challenges have been posed by the users out of which 316 projects have been accepted by Services.

(m) To provide impetus to self-reliance in defence manufacturing as part of Atmanirbhar Bharat Abhiyan, MoD has promulgated five ‘Positive Indigenisation Lists’ comprising 509 items. Out of 509 items, 98 projects worth Rs 1,53,993.29 Cr have already been ‘Contracted’.

(n) The Technology Development Fund (TDF) is a grant-in-aid scheme with the stated aim of defence innovation and indigenisation. An increased limit of Rs. 50 Cr (from 10 Cr earlier) has brought in newer and bigger opportunities.

(o) Defence Production and Exports Promotion Policy (DPEPP-2020) targets a turnover of US$ 25 billion, including exports of US$ 5 billion by 2025, thereby making India a net exporter instead of a net importer. Indian Defence Exports have jumped by more than 10 times (from 1522 Crores in 2016-17 to 15918 Crores in 2022-23). India has entered in the list of major global exporters. India is presently exporting to more than 100 Nations. Vision is to achieve Domestic defence production worth Rs 1,75,000 Cr and Defence Exports worth Rs 35,000 Cr by 2024-25.

Status Check: Govt of India Initiatives- Self-Reliance in Defence Sector.

5. As brought out in the previous para, in the recent past, the GoI has initiated various policy actions to boost indigenous design, development and manufacture of defence equipment. Pragmatic analysis reveals that the nation has just taken a U-turn from import-oriented defence equipment policy towards self-reliance with the slew of initiatives taken in the recent past; therefore, the journey has just begun. India remains the top importer of defence equipment. This subhead undertakes a review of GoI initiatives on Atmanirbharata in the defence sector, the role of the private sector and how private sector participation can be leveraged to meet the Atmanirbharta goals. The inputs have primarily been derived from an article on 'Effectiveness of Latest Government Initiatives to strengthen Defence Industry Ecosystem'[7] wherein the author has undertaken a ''Critical Review of Atmanirbhar Bharat Initiatives in Defence' which spells out the policy initiatives and the impact thereof.

6. **Draft DPEPP 2020**. The policy targeted a turnover of US$ 25 billion including export of US$ 5 billion by 2025, thereby making India a net exporter instead of net importer.

[7] Article by Col Kedar Gupte on 'Effectivenss of Latest Government Initiatives to strengthen Defence Industry Ecosystem' published by CENJOWS on 15 Jun 2023 (cenjows.in)

Status. In the period 2018-2022, India has remained the top importer with 11 % share. The policy still remains at draft stage and is yet to be promulgated.

7. **FDI in Defence**. Raised to 74%.

Status. DPIIT data - 39.03 Lakh Cr received as FDI equity inflow between Apr 2000 and Dec 2022 out of which the defence sector received 105.05 Cr (a share of average 0.0026%). As per data provided by MoD, the share works out to be 0.12% of the total FDI received in the last 22 years. To attract higher FDI, the prospects need to be made more attractive for investee companies.

8. **Share of Domestic & Foreign Procurement in Overall Capital Procurement**. There has been improvement in capital domestic procurement in FY 2021-22 (64.5% approx.) and FY 2022-23 (68% approx). MoD has set a target of 75% for FY 24-25.

Status. There is no scientific system in place to assess the exact level of indigenisation achieved by Defence production units. A substantial progress has been achieved however it needs to be noted that such figures can be deceiving e.g. The IC content in LCA - 50%, LCH- 45% etc.

9. **Def Export**. It is important to note that all BRICS nations except India have been figuring in top 25 def exporting countries for last number of years. India touched its highest defence exports of Rs. 15,198 Cr/ US $ 1.85 Billion in 2022-23 against target of $ 5 billion by 2025. The equipment where actual delivery has not happened are not included.

Status. Despite the domination of defence manufacturing and Govt of India support the share of exports by DPSUs is lower than that of private industry.

10. **Impact of Make Projects and iDEX**.

(a) **MAKE Projects**. AIP of 156 Make projects have been accorded to date by DDP/ MoD.

Status The contract for 04 projects have only been signed. These projects are progressing extremely slow and are not making the desired impact on private sector participation.

(b) **Innovation for Defence Excellence (iDEX)**. So far, all users have posed 287 problem statements. Start-ups/ Innovators have responded to all of them.

Status. Products are at various stages of prototype development or acquisition but no contracts have been signed till now.

11. **Import Embargo on Items to Boost Indigenisation**. A list of 411 items have been promulgated to promote domestic industry, earmarking 155mm artillery, 125mm FSAPDS, 40mm L 70 and almost an entire lot of small arms ammunition. In addition, a wide range of Assault Rifles, Light Machine Guns, Carbine, Sniper Rifles, Heavy Automotive assemblies, and a wide variety of simulators & targets, have been reserved for production by the domestic industry. The total value of AoN/ contracts is about Rs. 1,27,000 Cr and it is expected to generate business over Rs 12 Lakh Cr over next 10 years.

Status. Since 2018, five PILs have been promulgated. A total of 511 items are included which cover the period up to Dec 2032. Out of 511 items, AoN has been accorded for 127 items. 63 items/ spares have already been contracted.

12. **Corporatisation of Ordnance Factories**[8].

(a) Based on the Vijay Kelkar committee and Raman Puri committee reports, Cabinet approved to convert production units of OFB into seven DPSUs.

(b) The financial assistance will be provided to these organisations only till 2026-27.

[8] The corporatization of ordnance factories in India is a significant reform aimed at enhancing their functional autonomy, efficiency, and innovation. This move involves converting the Ordnance Factory Board (OFB) into one or more 100% government-owned corporate entities, registered under the Companies Act 2013. The decision to corporatize the ordnance factories was taken by the Cabinet Committee on Security (CCS) on July 29, 2020. The main objective is to make these factories more competitive, efficient, and profitable, while also promoting indigenization and self-reliance in defense production

(c) Import Content by OFs: 8-10% which is encouraging.

Status. These DPSUs have not spent even 1% of their turnover on R&D. The DPSUs exported equipment worth only Rs. 1360 Cr and Rs. 1166 Cr during the period 2020-21 and 2021-22, respectively. However, achievements of some of the PSUs towards defence production have been notable, with India successfully developing and producing indigenous platforms like the INS Vikrant, Tejas Light Combat Aircraft, Arjun Main Battle Tank, Akash and BrahMos supersonic cruise missile. Two Indian PSUs (HAL and BEL) have made it to top 100 Global Defence Companies List but there is no private company in this list. Even for most defence PSUs barring a few as mentioned above, due to Atamnirbharta the order book is full, but the quality standards are still below international norms.

13. **Defence Industrial Corridor (DIC).**

(a) Two Nodes (UP - 06 nodes & Tamilnadu - 05 nodes).

(b) Attract investments worth Rs. 10000 Cr in each of DICs by 2024-25.

(c) **UP Node**. UP DIC is presently focused on establishment of Missile units and next generation Brahmos project along with defence testing infrastructure.

(i) UP Govt promulgated Uttar Pradesh Defence & Aerospace Manufacturing Policy 2018 to attract investment in UPDIC.

(ii) **Aligarh Node**. 19 coys (most successful node).

(iii) **Janshi**. BDL plant set to come up for Rs. 400 Cr to make propulsion systems for ATMs.

(iv) **Lucknow**. Def Tech & Test Centre & Brahmos manufacturing Centre. Rs. 300 Cr Bhramos project planned to produce new Brahmos variant Brahmos NG.

(v) **Kanpur**. Adani Def & Aerospace integrated ammunition manufacturing facility worth Rs 1500 Cr.

(vi) **Agra & Chitrakut**. No MoUs.

(vil) **Total Investment Received**. Rs. 2445 Cr (MoU for DICs signed -12191 Cr).

(d) **Status - Tamil Nadu**. Towards the creation of an Aerospace and Defence (A&D) manufacturing ecosystem, TNDIC is positioning global OEMs and Tier 1/2 industries in various nodes.

(i) Tamil Nadu Aerospace & Defence Policy launched in Nov 22.

(ii) Investment Received - 3894 Cr (MoU signed - 11,794 Cr).

Status. Similar policy initiatives encouraging investment in Aero space & Def sector by Karnataka, Andhra Pradesh, Gujrat, Maharashtra, MP, Orissa and Telangana. The initiatives by states are encouraging and policies need to be pursued vigorously for desired outcome.

14. **Role of Private Players**. During last few years, the defence private sector has grown much faster.

(a) Share of defence exports - Fluctuation from 47%-91% during last six years (Avg - 73%).

(b) Defence manufacturing share has increased from 19% to 21.6 % during the same period.

Status. Govt has signed contracts worth Rs. 36,000 Cr (more than 50% of capital budget) with DPSUs on 30 Mar 23 with no contracts with any private industry. Indian private defence industry has grown over the years and in 2023, there are about 13000 plus MSMEs which act as vendor bases to defence PSUs. Few companies are Tier I defence manufacturers and exporters, however most others are Tier II, Ill and IV companies which only produce sub-systems for major equipment. Most industries venturing into the defence sector lack adequate

knowledge of the provisions, procedures and methodology of approaching defence-related tenders. Hence, there is a requirement to fine-tune policy framework, guide and thereafter incentivize the private defence industry so that the requirements of the Defence Services can be efficiently met. Some of the notable achievements of private industries are listed below:-

(a) ***Tata Aerospace & Defence***. Tata Aerospace & Defence has excelled with collaboration with foreign OEMs including exports. Pinaka Multi Barrel Rocket Launcher (MBRL) systems, launchers for Akash SAM for IAF, Combat systems for Arihant class of submarines. Tata Group & Airbus will now manufacture C-295 transport aircraft in Gujrat (Project cost - 21,935).

(b) ***L&T.*** K-9 Vajra-T (4500 Cr contract for 100 units), Pinaka and BM-21 upgrade for Army artillery, Akash for Army and IAF, Brahmos, range of bridging systems for Army Engineers, platform specific engineering systems for naval platforms, multi-purpose vessels (Rs. 887 Cr), floating docks for the Navy (FDN-II), offshore patrol vessels and interceptor boats for ICG. Latest contract is the construction of three cadet training ships at Katupalli shipyards (Rs.3108Cr).

(c) ***Mahindra Defence***. Mahindra with Paramount (South Africa) is enhancing the production of Armoured vehicles including exports. Other projects include an Integrated anti-submarine warfare defence suit (IADS) for Navy (Rs 1350 Cr), 1300 light specialists vehicles for Army(Rs 1056 Cr), 155 mm/ 39 calibre M-77782 ultra-light howitzers, Assembly integration and test facility at Faridabad with BAE are their major contribution.

(d) ***Kalyani Group*** (Bharat Forge). 16 quick reaction armoured fighting vehicles (Kalyani N-4) for Army, 155 mm/ 52 calibre advance towed artillery gun systems (ATAGS), jointly developed with DRDO. Kalyani Group has bagged strategic orders worth US $ 155 million.

(e) ***Adani Defence***. Focusses on Small Arms and ammunition, Anti-drone systems and maintenance and aircraft repair & overhaul. They have bid to establish Asia' largest Rs. 1500 Cr ammunition factory at Kanpur.

15. **Strategic Partnership Model**. The government has promulgated the Strategic Partnership (SP) Model under which select Indian firms will lead the effort to build military platforms like submarines, fighter jets, helicopters and armoured fighting vehicles/main battle tanks in India in partnership with foreign technology collaborator.

Status. CCS approved SP model to manufacture large platforms through technology transfers to private sector with the aim of building a second manufacturing line in addition to DPSUs. A/so 25% defence R&D buget for private sector has been earmarked. Industry has not seen any traction in this vital direction.

Private Sector Participation in Defence R&D

16. As per **Issue Brief (Issue No 708 May 2024) ORF** , Private sector participation in defence R&D has gained significant attention in recent years due to its potential to drive innovation, improve efficiency, and enhance national security. Some of the benefits of Private Sector Participation are as under :-

(a) **Increased Innovation**. Private sector companies bring new technologies and innovative approaches to defence R&D.

(b) **Improved Efficiency**. Private sector participation can reduce costs and increase productivity in defence R&D.

(c) **Enhanced National Security**. Private sector companies can provide critical capabilities and expertise to support national security.

(d) **Challenges and Limitations of Private Sector Participation.** Some of them are listed below:-

(i) Security clearance and intellectual property issues.

(ii) Cultural and communication barriers between private sector and government.

(iii) Dependence on government funding and procurement.

Defence Manufacturing and Procurement in India

17. **Current State of Defence Manufacturing in India.**

(a) India is the world's largest arms importer, accounting for 12% of global imports **(SIPRI, 2023)**

(b) The domestic defence industry is dominated by public sector undertakings (PSUs), with limited private sector participation **(Chandrashekhar, 2019)**

(c) India has made significant progress in developing indigenous defence capabilities, including the Tejas fighter jet and Arihant submarine **(Laxman Kumar Behera 2020)**

18. **Procurement Processes and Challenges.**

(a) The procurement process is complex and time-consuming, with multiple stakeholders involved (**Anurag Chibber, 2021)**

(b) Delays in procurement have led to cost overruns and reduced operational effectiveness (**Chandrashekhar, 2019)**

(c) The Defence Procurement Procedure (DPP) has been revised multiple times to address these challenges **(MOD, 2020)**

19. **Make in India and Defence Industrial Corridors.**

(a) The "Make in India" initiative aims to promote domestic defence manufacturing and reduce imports **(PMO, 2014)**

(b) Defence Industrial Corridors have been established in Tamil Nadu and Uttar Pradesh to support defence manufacturing **(MOD, 2020)**

(c) Private sector companies like Reliance Defence and Tata Defence have made significant investments in defence manufacturing **(Kumar Bahera, 2020)**

20. **Challenges and Opportunities.**

(a) Challenges include a lack of infrastructure, skilled workforce, and technology transfer **(Chandrashekhar, 2019)**

(b) Opportunities exist for collaboration between public and private sectors, and with foreign partners (**Anurag Chibber, 2021**)

(c) The government has introduced policies like the Strategic Partnership model to promote private sector participation (**MOD, 2020**)

Innovation and collaboration

21. Innovation and collaboration are critical components of a robust defence ecosystem. In the Indian context, there is a growing recognition of the need for innovation and collaboration to enhance defence capabilities and reduce dependence on imports.

(a) **Innovation in Defence**.

(i) India has made significant progress in developing indigenous defence technologies, including missile systems, aircraft, and naval vessels (**Kumar Bahera, 2020)**

(ii) The Defence Research and Development Organisation (DRDO) has played a key role in driving innovation in defence **(DRDO, 2020)**

(iii) Private sector companies like Tata Defence and Reliance Defence are also investing in defence R&D **(Kumar Bahera, 2020)**

(b) **Collaboration in Defence.**

(i) Collaboration between public and private sectors is critical for driving innovation in defence (**Anurag Chibber, 2021**)

(ii) The government has introduced policies like the Strategic Partnership model to promote private sector participation (**MOD, 2020**)

(iii) International collaboration is also essential, with India partnering with countries like the US, Israel, and Russia on defence projects (**Chandrashekhar, 2019**)

(c) **Challenges and Opportunities.**

(i) Challenges include intellectual property issues, funding constraints, and regulatory hurdles (**Chandrashekhar, 2019**)

(ii) Opportunities exist for collaboration between startups, academia, and industry on defence innovation (**Kumar Bahera 2020)**

(iii) The government has established initiatives like the Innovations for Defence Excellence (iDEX) to promote defence innovation **(MOD, 2020)**

National Security and Business Interests

22. **Interplay between National Security and Business Interests.**

(a) National security considerations drive business opportunities in the defence sector (**Chandrashekhar, 2019)**

(b) Business interests can compromise national security if not aligned with strategic interests **(Chandrashekhar, 2019)**

(c) The government must balance national security and business interests in defence decision-making **Chandrashekhar, 2019)**

23 The literature review highlights the complex interplay between national security and business interests in the Indian defence sector. While national security considerations drive defence procurement and industrial policies, business interests can compromise strategic interests if not aligned. The government must balance these competing interests to promote self-reliance, indigenization, and modernization of the defence industry through a comprehensive policy framework and invigorate private sector participation in defence R&D and production.

CHAPTER 3

ANALYSIS OF CURRENT POLICY FRAMEWORK

Review of Current Policy Framework

1. **Review of Digital Platforms / Websites of the Ministries/Departments of Government and Other Agencies.** There are a large number of agencies involved in Atmanirbharata in defence. The digital platforms/websites of various agencies / stakeholders and other relevant material on the internet was accessed. Thereafter a pragmatic analysis of the current policy framework was undertaken in consultation with key stakeholders to understand the impact of government policy towards invigorating private sector participation in defence industry ecosystem.

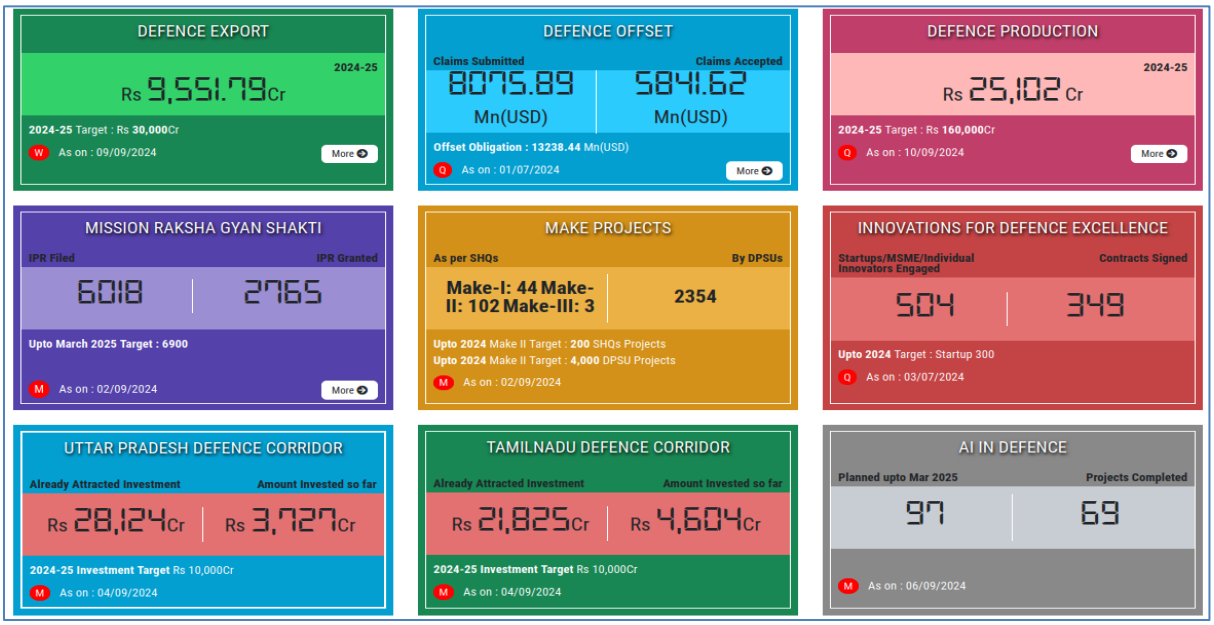


Figure 3.1 Digital Platforms / Websites of Various Organisations/ Agencies

(Source: Developed by author from Digital platforms/websites)

2. As seen from the above figure, India's defence exports have shown a lacklustre performance, with the total value of defence exports reaching ₹9551.79

crore. Despite the government's efforts to boost defence exports, the growth rate has been sluggish, indicating that the sector still faces significant challenges. The target to achieve ₹35,000 crore in defence exports by 2025 seems ambitious, given the current pace. Also, India's defence offset policy has yielded underwhelming results, with the total value of defence offsets standing at ₹5841.62 crore. This figure is disappointing, considering the potential for defence offsets to stimulate domestic industrial growth, foster technology transfer, and enhance self-reliance in defence production. The current defence production figure for the year 2024-25 is ₹1,75,000 crore, which includes exports valued at ₹35,000 crore. This target is part of the government's ambitious plan to increase India's yearly defence output to ₹3 lakh crore by 2028-2029[1]. However the same is unlikely to be achieved unless the potential of private sector is harnessed.

3. Mission Raksha Gyan Shakti is an initiative by the Indian Ministry of Defence to promote intellectual property (IP) rights and foster a culture of innovation within the defence sector. Launched in 2020, the mission aims to encourage defence personnel, scientists, and engineers to file patents and protect their intellectual property. By doing so, it seeks to boost indigenous defence production, reduce reliance on foreign technology, and enhance India's self-reliance in defence capabilities. As seen the achieved remains well below the stated targets. The Indian government's 'Make' projects, aimed at promoting indigenous defence manufacturing, have failed to gain momentum. Despite the ambitious initiative, several projects have been stalled or delayed due to various reasons, including bureaucratic hurdles, lack of clarity on policies, and inadequate funding. As a result, the 'Make' projects have not been able to achieve their intended objective of boosting domestic defence production and reducing reliance on imports. The Innovations for Defence Excellence (iDEX) initiative, launched to foster innovation and entrepreneurship in the defence sector, has shown modest progress. Despite its potential, iDEX has faced challenges in attracting significant investments and scaling up innovative solutions. The initiative's impact has been limited, and it has not yet achieved its goal of transforming India's defence innovation ecosystem and promoting self-reliance in

defence technologies. A detailed summary on various Governemnt initiatives and its impact thereoff has been listed in succeeding paras.

Summary of Government Policies and Impact Assessment

4. During the interactions and discussions with stakeholders especially SMEs following areas under the current policy framework were identified which have the potential to enhance the private sector participation in defence.

(a) FDI in Defence.
(b) Revision of Defence Acquisition Procedure (DAP 2020).
(c) Revision of Defence Procurement Manual.
(d) Technology Development Fund.
(e) Design & Development Projects.
(d) Make Projects.
(e) IDEX.
(f) PIL.
(g) Defence Industrial Corridors.
(h) Level Playing Field for Private Sector.
(j) Support to MSMEs.
(k) Transparency and Exposure.

Impact Assessment

5. **FDI in Defence.** Since the notification of the revised FDI policy, the total FDI inflow reported till May 2022 is only approx Rs 494 Cr.

(a) **Positive Impacts Expected.**

(i) Foreign companies can bring in cutting-edge technologies, enabling Indian companies to design and develop state of art defence equipment.

(ii) FDI can lead to increased collaboration between foreign and Indian companies. The government's Strategic Partnership Model encourages Indian companies to partner with Original equipment manufacturers (OEMs).

(iii) FDI can help reduce dependence on imports and promote Indigenisation.

6. **Effectiveness / Impact of Policy.** The actual impact of the policy has been deplorable as is seen from the total inflows. Also, there has been no critical transfer of technology to any Indian companies. Though, the Indian companies are collaborating , they are primarily assembling with foreign companies, but mainly, they are assembling semi-knocked kits. for eg. BAE Systems partnered with Mahindra Defence in the case of the M 777 A2 ULH gun system where the gun was only assembled in India.

7. **Revision of Defence Acquisition Procedure (DAP 2020)**. The Defence Acquisition Procedure (DAP) 2020 is a significant policy document that outlines the guidelines and procedures for defence acquisitions in India. Here's a critical analysis
of its impact:-

(a) **Positive Impacts**

(i) DAP 2020 simplifies the acquisition process, reducing the number of stages and approvals required.

(ii) The policy emphasizes the need for indigenous content, encouraging domestic manufacturing and reducing dependence on imports.

(iii) DAP 2020 introduces new acquisition categories, such as "Buy (Indian-IDDM)" and "Buy (Global-Manufacture in India)", providing more flexibility in the acquisition process.

(iv) The policy provides opportunities for start-ups and Micro, Small, and Medium Enterprises (MSMEs) to participate in defence acquisitions.

(v) DAP 2020 provides opportunities for Indian companies to export defence equipment, which can help build India's defence industry.

(vi) The policy encourages public-private partnerships, which can help leverage private sector expertise and resources.

8. **Effectiveness / Impact.** DAP 2020 is a significant step towards reforming India's defence acquisition process. It has its strengths, such as simplified procedures and increased emphasis on indigenous content. However, despite simplification efforts, the policy still has complex procedures and requirements. While the policy encourages indigenous content, it does not provide sufficient emphasis on research and development, which is critical for developing cutting-edge defence technologies.

9. **DPM**. On the revenue side, Defence Procurement Manual, which deals with procurement for sustenance, has been revised and it is in final stages of approval. To promote indigenisation, a separate chapter 'Promoting Self-Reliance through Innovation and Indigenisation' has been added in the revised DPM-25 and a comprehensive SOP in the form of 'Defence Indigenisation Procedure (DIP)' has also been included in the DPM-25.

10**.** **Effectiveness / Impact.** The revision has been underway for almost a decade now and is yet to see the light of the day. The revenue procurements are still being guided by DPM 2009 and the revisions thereof.

11. **TDF** . The TDF is a flagship program of DRDO to promote indigenous development of defence and dual-use technology. The details are as under:-

- TDF Grant – Rs. 50 Cr
- Total Projects including DRDO – 78
- IA – 05, IN – 24, IAF - 16
- Total Grant – 333.21 Cr
- Total 27 Technologies under 10 Projects successfully developed

SNAP SHOT: MAJOR TDF PROJECTS
ARMY
Course Correction Fuze for Artillery
Logistics Drones for High Altitude
Exoskeleton
NAVY
Composite Sea-water Pump
VLF Loop Aerial
Water-tight Doors & Hatches
AIR FORCE
Air to Air Refueling POD
Power Supply for Airborne Jammer
Cold Flaps for Aero Engine

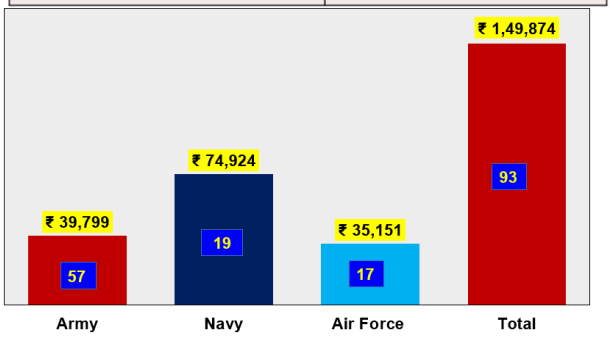
Figure 3.2 Digital Platforms / Websites of Various Organisations/ Agencies

(Source : Developed by author from Digital platforms / websites)

12. **Effectiveness / Impact .** The major TDF projects are still hovering around technologies already in use by modern armies and no critical / niche technology has been developed. The private sector participation in TDF projects still remains less than satisfactory.

13. **Design & Development Projects.** These are major projects undertaken by DRDO across major domains in partnership with Public sector and Private sector undertakings:-

D&D Schemes	
Contracted	34
Ongoing	50
Foreclosed/ AoN Lapsed	09
Total	93



SNAPSHOT: MAJOR D&D PROJECTS
ARMY
NAMICA (NAG Missile earlier)
Modular Bridge (Class 70)
Area Denial Munition (ADM)
NAVY
Twin Engine Deck Based Fighter (TEDBF)
VL-SR SAM
LR SAM for Aircraft Carrier
AIR FORCE
Unified Mission Computer for Su-30
Long Range Guided Bomb
LCA Mark 1A

Figure 3.3 Digital Platforms / Websites of Various Organisations/ Agencies

(Source : Developed by author from Digital platforms/websites)

14. **Effectiveness / Impact**. Despite its successes, DRDO has faced criticism for several failures and shortcomings. The private sector is certainly not enthused with TDF. Some of the key issues are as under:-

(a) **Projects.**

(i) **Arjun Main Battle Tank**. Delayed development, weight issues, and poor performance led to limited adoption.

(ii) **LCA Tejas**. Delays, cost overruns, and performance issues have plagued the program.

(iii) **Kaveri Engine**. Failed to meet performance requirements, leading to reliance on foreign engines.

(iv) **Nag Anti-Tank Missile.** Delayed development and technical issues have limited its deployment.

(b) **Technological Challenges**

(i) **Engine Development**. DRDO has struggled to develop reliable and powerful engines for its aircraft and missile programs.

(ii) **Radar and Electronic Warfare.** DRDO's radar and electronic warfare systems have been criticized for their limited capabilities.

(iii) **Materials Science.** DRDO has faced challenges in developing advanced materials for its programs.

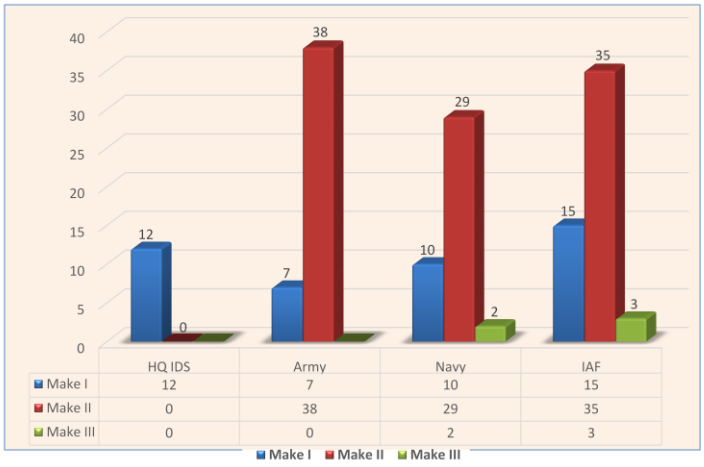
(c) **Management and Administrative Issues**.

(i) **Bureaucratic Delays**. Slow decision-making and bureaucratic processes have hindered project progress.

(ii) **Lack of Private Sector Participation**. The limited involvement of private sector companies has restricted innovation and expertise.

(iii) **Insufficient Funding**. Inadequate funding has impacted project timelines and overall performance.

15. **Make Projects** The details are as under :-



Physical Progress – not encouraging

Out of 151 AIP Projects, 65 accorded AoN : 04 Projects contracted

CONTRACTED ITEMS		
Terminal End Secrecy Device	Make 1	Army
Expendable Aerial Target	Make 2	Army
Upgraded Assault Trackway	Make 2	Army
Sonar Towing Winch	Make 2	Navy

SNAPSHOT : MAJOR MAKE PROJECTS		
Indian Light Tank	Make 1	Army
Swarm Drones	Make 2	Army
HEAUV	Make 1	Navy
6 MW Diesel Engine	Make 2	Navy
Airborne Jammer	Make 1	Air Force
125 Kg Bomb	Make 2	Air Force

Figure 3.4 Digital Platforms / Websites of Various Organisations/ Agencies

(Source : Developed by author from Digital platforms / websites)

16. **Effectiveness / Impact.**

(a) **Delays and Procedural Issues**

(i) **Slow Project Sanctioning** The approval process for "Make" projects is often slow, leading to delays in project initiation.

(ii) **Complex Procedures**. The multiple stages involved in the "Make" process, including the issuance of RFPs, evaluation, and contract negotiation, can be cumbersome and time-consuming.

(b) **Funding Constraints.**

(i) **Limited Budget Allocation** The budget allocated for "Make" projects is often insufficient, leading to delays or scaling down of projects.

(ii) **No Separate Funding**. "Make" projects compete with other defence modernization programs for funding, which can lead to prioritization issues.

(c) **Industry Participation and Capacity Building.**

(i) **Limited Private Sector Participation**. Despite the "Make" initiative, private sector participation in defence production remains limited, with many companies hesitant to invest in defence research and development.

(ii) **Capacity Building**. The "Make" initiative has not adequately addressed the need for capacity building in the defence industry, particularly in areas like research and development, testing, and validation.

(d) **Intellectual Property Rights and Technology Transfer.**

(i) **IPR Concerns**. The "Make" initiative has raised concerns about intellectual property rights, with some foreign companies hesitant to share technology due to fears of IPR violations.

(ii) **Technology Transfer**. The "Make" initiative has not ensured effective technology transfer from foreign partners to Indian industry, which can limit the development of indigenous capabilities.

17. **iDEX.** iDEX (Innovations for Defence Excellence) is a flagship initiative of the Indian government, launched in 2018, to promote innovation and entrepreneurship in the defence sector. The details are as under:-

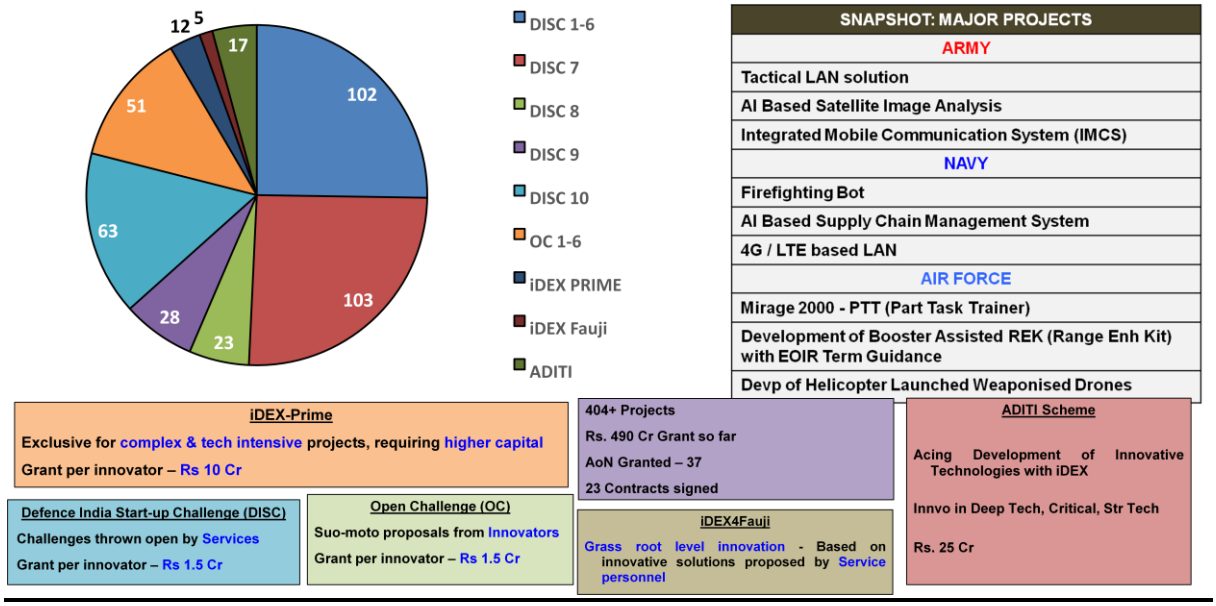


Figure 3.5 Digital Platforms / Websites of Various Organisations/ Agencies

(Source : Developed by author from Digital platforms / websites)

18. **Effectivenss / Impact**. While iDEX has shown promise, a critical examination reveals several concerns:

(a) **Funding and Support**

(i) **Limited Funding**. iDEX has limited funding, which can restrict the number of projects that can be supported.

(ii) **Bureaucratic Delays**. Funding disbursement and project approvals can be slow due to bureaucratic processes.

(b) **Ecosystem Development**

(i) **Lack of Infrastructure**. iDEX lacks dedicated infrastructure, such as incubation centers, testing facilities, and prototyping labs.

(ii) **Limited Mentorship**. iDEX needs more experienced mentors and industry experts to guide startups and innovators.

(c) **Procurement and Integration**

(i) **Complex Procurement Processes**. iDEX projects must navigate complex procurement processes, which can be daunting for startups and innovators.

(ii) **Integration Challenges**. iDEX projects often face challenges integrating with existing defence systems and infrastructure.

19. **PIL.** Total for five PILs has been released comprising of total of 509 items. The details as on 30 Jun are as under:-

	No of Items	**Expenditure in Cr**
Contracted	132	188092.93
AoN	124	398812.56
Balance	253	704673.83
Total	509	1291579.32

Table 3.2 Digital Platforms / Websites of Various Organisations/ Agencies

(Source : Developed by author from Digital platforms / websites)

20. **Impact /Effectiveness.** To provide impetus to self-reliance in defence manufacturing as part of Atmanirbhar Bharat Abhiyan, MoD has promulgated five 'Positive Indigenisation Lists' comprising 509 items. Out of 509 items, 98 projects

worth Rs 1,53,993.29 Cr have already been ‘Contracted’. It is expected that it will generate total business of 10 Lakh crores.

21. **Defence Industry Corridors.** The details are as under:-

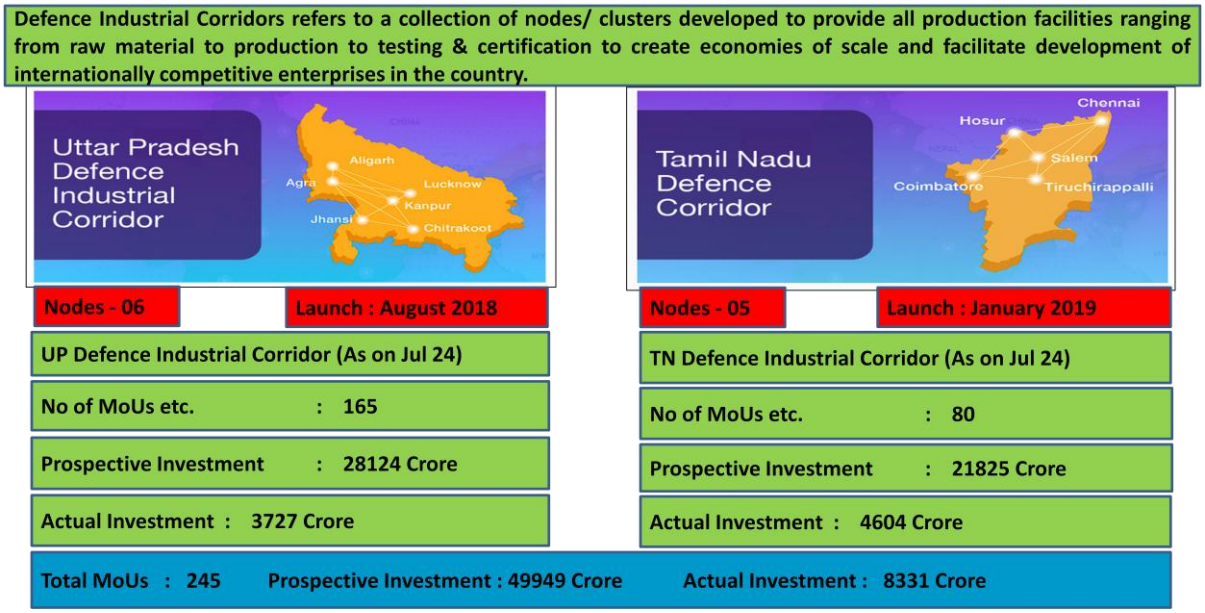


Figure 3.6 Digital Platforms / Websites of Various Organisations/ Agencies

(Source : Developed by author from Digital platforms/websites)

22. **Effectiveness / Impact**. The DICs have been established without a clear cut policy framework/ regulatory framework leading to a very low level of private sector participation.

23. **Level Playing Field for Private Players.** The government has introduced several key reforms to foster a level playing field for private players in defence production. The corporatisation of Defence Public Sector Undertakings (DPSUs) is a significant step towards creating a more competitive environment. Additionally, parity in securities and payment terms has been established, ensuring that private players are not disadvantaged compared to their public sector counterparts. The replacement of the 10% Bank Guarantee (BG) with a 3%

Earnest Money Deposit (EMD) has also reduced the financial burden on private players. Furthermore, the nomination of at least two Development-cum-Production Partners (DcPP) for Design and Development (D&D) cases has provided private players with opportunities to participate in the development of cutting-edge defence technologies. These reforms collectively aim to promote a fair and competitive environment, encouraging private players to invest in defence production and driving innovation in the sector.

24. **Effectiveness / Impact**. The corporatisation process lacks clear guidelines, timelines, and objectives, which may lead to confusion and inefficiencies. The benefits of corporatisation, such as increased efficiency and competitiveness, are uncertain and may not necessarily materialize in creating a level playing field. The parity in securities and payment terms may not be comprehensive, leaving some areas of disadvantage for private players. Ensuring parity in practice may be difficult, given the complexities of defence contracting and the dominance of DPSUs. Private players may still face inequitable treatment, such as differing standards for quality, testing, and certification. The reduction from 10% BG to 3% EMD may not provide sufficient relief to private players, who still face significant financial burdens. The change may not address the underlying issues of an uneven playing field, where DPSUs enjoy advantages such as government funding and subsidies. The nomination of at least two DcPP may be seen as tokenism, as private players may still face significant barriers to participation. The opportunities for private players to participate in D&D cases may be limited, with DPSUs dominating the landscape.

25. **Support to MSMEs.** The government has taken significant steps to support Micro, Small, and Medium Enterprises (MSMEs) in defence production. The definition of MSMEs has been revised, removing the distinction between manufacturing and services, allowing more businesses to qualify for benefits. To promote indigenous production, acquisitions up to Rs 100 crore are reserved for MSMEs, providing them with opportunities to participate in defence production.

Furthermore, the government has announced a collateral-free loan of Rs 3 lakh crore for MSMEs, easing their access to credit and enabling them to scale up their operations. These initiatives aim to empower MSMEs, fostering innovation, and self-reliance in defence production.

26. **Effectiveness /Impact** The revised definition of MSMEs may be too broad, potentially allowing larger companies to take advantage of benefits meant for smaller enterprises. The removal of the distinction between manufacturing and services may lead to confusion and inconsistent application of benefits. The reservation of acquisitions up to Rs 100 crore may not be sufficient to support MSMEs, as many defence contracts exceed this value. MSMEs may still face competition from larger players, including DPSUs and foreign companies, which could limit their opportunities. MSMEs may face challenges in accessing the collateral-free loan, including stringent eligibility criteria and bureaucratic processes.

Key Takeaways

27. Pragmatic analysis reveals that with the slew of initiatives taken in the recent past by the Government, the nation has successfully taken a U-turn towards the path of self-reliance from an import-oriented defence equipment ecosystem. However, there is a long way to go to bring the Indian Military Industrial Complex to par with the best in the field. Achieving self-reliance is a complex process and needs multifaceted endeavours in which private sector participation remains pivotal.

Barriers and Challenges to Private Sector Participation in Defence R&D and Production

28. Based on a number of interactions and group discussions with various stakeholders and a summarization of the effect of various initiatives, the following barriers and challenges were identified in the current policy framework.

(a) **Funding Issues**. Private sector companies face significant funding challenges when it comes to investing in defence research and development. The high-risk, high-reward nature of defence projects makes it difficult for companies to secure funding from investors. This hinders their ability to develop innovative defence technologies.

(b) **Regulatory Hurdles**. The complex regulatory framework governing defence production in India is a major barrier to private sector participation. Lengthy licensing processes, multiple approvals, and bureaucratic red tape slow down project timelines and increase costs.

(c) **Lack of Level Playing Field.** Private sector companies feel that the government's procurement policies favor public sector undertakings (PSUs) and foreign original equipment manufacturers (FOEMs) over private players. This creates an uneven playing field, making it difficult for private companies to compete.

(d) **Limited Access to R&D and Manufacturing Capability**. The lack of a comprehensive database on private sector R&D and manufacturing capabilities makes it difficult for companies to collaborate and partner with each other. This limits the growth of the defence industry ecosystem.

(e) **Underdeveloped Defence Industry Corridors**. The defence industry corridors, aimed at promoting defence manufacturing, lack adequate infrastructure and support services. This makes it difficult for private companies to set up and operate in these corridors.

(f) **Trials, Testing, and Quality Assurance Issues**. Private sector companies face significant challenges in getting their products tested and certified. The lack of testing infrastructure, complex procedures, and limited availability of testing facilities hinder the growth of the defence industry.

(g) **Srijan Portal Challenges**. The Srijan Portal, meant to facilitate defence procurement, is difficult to navigate, and users face significant challenges in uploading and managing documents. This creates frustration and delays in the procurement process.

(h) **DPEPP 2020 Limitations**. The Draft Defence Production and Export Promotion Policy (DPEPP) 2020 is seen as restrictive and confusing by private sector companies. The policy is yet to be pronounced and its limitations hinder the growth of defence exports and create uncertainty among exporters.

(j) **Human Capital Constraints**. The defence industry faces significant human capital constraints, including a shortage of skilled manpower and research expertise. This limits the growth of the industry and creates challenges for companies looking to develop innovative defence technologies.

29. Based on the above inputs received from government discussion websites/discussion and interaction with practitioners / SMEs / officials ten key issues that need to be addressed were identified to leapfrog private sector participation in the defence ecosystem to achieve self-reliance in defence.

(a) **Key Issue No. 1**. Enhance Private Sector Participation in R&D including Funding Issues.

(b) **Key Issue No 2**. Recommendation by Private Industry on Make projects, iDEX, PIL & TDF.

(c) **Key Issue No 3**. Incentivizing Private Sector Participation in Defence manufacturing ecosystem.

(d) **Key Issue No 4**. Ensuring a Level Playing Field for Private Defence Industries in line with Foreign Original Equipment Manufacturers (FOEM) and DPSUs to build trust in Indian Industry.

(e) **Key Issue No 5.** Mapping of R&D and Defence Manufacturing Capability of Private Industry for Collaborative Efforts.

(f) **Key Issue No 6.** Development, Management and Enhancing Private Sector Participation in Defence Industry Corridor (DIC).

(g) **Key Issue No 7.** Trials, Testing and Quality Assurance Issues.

(h) **Key Issue No 8**. Challenges regarding Srijan Portal.

(j) **Key Issue No 9**. Draft DPEPP 2020 & Defence Exports.

(k) **Key Issue No 10**. Enhancing Understanding and Interaction between Stakeholders.

29. During discussion with various stakeholders, it emerged that any policy framework that addresses these above ten key issues would lay a strong foundation to leapfrog private sector participation and the overall indigenisation efforts. Additional interviews and focussed group discussions were conducted and a detailed questionnaire as attached at Appendix A was prepared to get the views of various stakeholders. These issues were taken up once again with stakeholders and SMEs for obtaining and formulating recommendations towards a policy framework.

CHAPTER 4

INTERNATIONAL BEST PRACTICES IN DEFENCE R&D AND MANUFACTURING

1, A scan of defence R&D and defence industrial ecosystem has been undertaken in this chapter, The author studied and interacted with SMEs primarily with the scientists from DRDO and academia to bring out the defence industrialization process of militarily developing and developed countries so as to adapt certain best practices in our defence industry ecosystem.

USA

2. **Defence Industrialization and Reforms of USA**. The US defence industrial base (DIB) is the biggest in the world, highly technologically advanced, multi-layered and is globally very well connected. Public and private sectors are well integrated in research, production and sustainment capabilities. US DIB is capable of producing the entire range of defence products and services. The progressive policies of the US Government have ensured its DIB as a source of strategic advantage. Defence industry is encouraged for diversification into civilian production. Commercially developed technology is also exploited for military applications. Various policy initiatives promote mergers, acquisitions and arms exports so as to consolidate defence markets. Arms exports are promoted by giving subsidies and eliminating fees on arms exports.

3. There were 50 major defence firms at the start of 1990's which had been merged into six large entities by the end of 1990's and finally five US giant firms i.e. Boeing, Lockheed Martin, Northrop Grumman, General Dynamics, and Raytheon. These firms

managed to survive the period of industry contraction. The major firms team up or link across many programs and are Large Scale Integrators, builders of platform and providers of sub-system & components. Therefore, there is a shift from the platform centric thinking to a network centric thinking or a system of systems thinking.

4. Research and Engineering Enterprise comprising of several military departments and laboratories is the technological strength of US Department of Defence (DoD). It's well allied with other government labs, universities affiliated research centers and industrial base. The delivery of advanced and state of the art technology is always a high priority irrespective of fiscal constraint. Defence Advanced Research Projects Agency (DARPA) oversees creative research programmes which are of four to six years duration. It's a non-hierarchical organisation and sponsors high-payoff research for military applications. It identifies talent and ideas from individuals, academia government laboratories and industry and awards R&D contracts for execution. DARPA invests in the programmes that may result in revolutionary change and breakthrough capabilities for enhancing national security. It acts as a catalyst for a highly capable and unique technology base. Procurement laws and regulations have been revised to integrate military and commercial manufacturing and overcome barriers. The DoD uses commercial specifications and buying practices unless there is a compelling need for military specific practices.

5. Defence Acquisition University has been established to impart training to the personnel involved in acquisition and improve their performance. The concept of 'Best Value' or L1P1 criterion (i.e. combination of the lowest cost and the best performance) is followed in competitions. Competition is ensured at design and prototype stage to ensure technical feasibility, affordability, productionisation and supportability. It is not essential to have two firms in the production stage.

6. Overall, the R&D Ecosystem of US is based on proactive engagement with private sector, protecting critical and emerging technologies, recruit/ retain/ cultivate talent, upgradation of physical & digital infrastructure and most importantly. financial support/ incentives. Some of the key aspects of US Ecosystem are as follows:-

(a) Measures to convert useful research in laboratories into vibrant development ecosystem. Attract new partners in order to grow research & collaboration base.

(b) Defence Services (Army, Navy, Air Force and Marine Corps) completely meshed with Defence R&D.

(c) Army, Navy, Air Force and Marine Corps have their own research Laboratories with lean R8D Organisation. The organisation includes Scientists, PHD holders, academicians, Subject Matter Experts (SMEs) and respective Service component.

(d) The R&D is based mainly on following aspects: -

(i) **Accelerators**. Accerators typically provide money and network of experts.

(ii) **Challenges**. Single/ recurring contest or competition, aimed at solving problems.

(iii) **Connector**. Private firms and academicians to facilitate partnership to solve challenging problems.

(iv) **Funding Opportunity**. Funding opportunities given to Start-ups/ small business to invest and enhance chances of success.

(v) **Govt Contracting Authority**. Any organisation with Govt contract authority can execute contract.

(vi) **Incubators**. Incubators focus on Start-ups and entrepreneurial entities with innovative ideas.

7. **DARPA**. Defence Advanced Research Projects Agency (DARPA) is R&D agency which is agile, idea-driven and outcome-based organisation. It hires personnel for three years and 20% are turned around each year. Project managers are from various public and private institutions with good credentials in their fields of expertise. The peculiar aspects of the organisations are as follows:-

(i) The head of the respective faculty is a competent financial authority for financial sanctions. unding is very attractive.

(ii) DARPA mainly focuses on futuristic/ niche technologies for national security.

(iii) Make pivotal investments in breakthrough technologies for national security.

(iv) Agency works with fast pace and constantly start/ stop programs based on requirement. Failures are accepted and risk apetite is high.

8. **Defence Industry Ecosystem**. The three largest defence companies in the world are United States companies namelv Lockheed Martin, Northrop Grumman and Boeing. A resolute inventory policy by the Government ensures streamlining of military equipment by various vendors for e.g. Advanced Land Systems by BAE Systems, Fighter aircraft by Lockheed Martin etc. Further, large defence companies in US have succeeded in creating a vibrant ecosystem near their premises through development of township, as in the case of BAE Systems at Arlignton and Boing at Virgina. Domain specialisation of companies, S&T policy of 2023, association of US Labs with department verticals, role of DARPA and award of grants plays a re-vitalising role.

9. **Israeli Defence Industry**. Create advanced R&D facilities which are defence-oriented. Israel spends approximately 7.5% of Israel's military spending

on R&D. Its R&D expenditure is approximately 4.2% of the GDP. The highlights are as follows:-

(a) Directorate of Defence R&D, Rafael (Armament Development Authority), Israel Aircraft Industry (IAl) and Israel Military Industries (IMI) are keyorgans of Israel Defence Industry.

(b) **Talpiot Program.** The soldiers of the Talpiot program begin their military service at Hebrew University. The students are then trained in military strategy and complete officers training program. They are thereafter taken to special course in each force to learn about the systems and gain a real understanding of operational and technological needs. They are the source of innovative technologies.

South Korea

10. **South Korean Defence Industry**. South Korea focused on structural reforms, enhanced defence R&D budget allocations and a shift from licensed production of USA designed weapon systems to products developed through indigenous efforts. These policy initiatives resulted in remarkable growth in Defence Industrial Base. South Koreas defence industry relies on private conglomerates like Hyundai and Hanwha for production of military equipment. South Korea is a positive case study to gain implementable lessons. South Korea has en-cashed every opportunity to push its defence exports marching towards complete self-reliance. The distinguishing factors when compared to Indian Industry are affordability, speed of delivery and Quality Assurance standards matching with the international standards and compatibility with NATO equipment leading to easy integration. South Korean weapons makers produce systems designed for joint operations with NATO, making them easy to integrate with NATO. India and South Korean defence export trajectory started post the 1950's

however South Korean growth in the past 20 years has been exponential as compared to India.

Russia

11. **Russia Defence Industry**. Russia has established Foundation of Prospective Research (FPI), similar structure like DARPA, to realise its innovation goals. It has different professional credos such as high risk, long-term, fundamental R&D for breathtaking military and dual-use innovative technology. The highlights of Russian Defence manufacturing industry are as follows:-

(a) The research institutes undertake applied research.

(b) The design bureau engages in developing prototypes.

(c) Scientific production associations combine R&D facilities with their own production factories.

(d) 300 research institutes, 130 design bureaus and 170 scientific production organisations.

China

12. **Chinese Defence Industry**. Sustained policy and structural reforms undertaken by China's leadership improved its Military Industrial Complexes (MICs) organized into 10 conglomerates and their subsidiaries. China has recognized the importance of increased involvement of private sector to promote a more competitive Defence Industrial Base. China has built a centre of excellence within two corporations, thereby promoting limited competition and also avoiding diversification of capabilities across various enterprises. SOEs also participate in the commercial sector to generate revenue for funding military programmes. China has ensured sustained double-digit year on year increase in military spending and more specifically spending on procurements. It has accelerated defence R&D, design and manufacturing capability.

13. China infused competitive mechanism into defence R&D, faster application and productionisation of research findings and integration of civil and military technologies. Technology development strategy of IDAR i.e. Introduce, Digest, Absorb and Re-innovate. China resorted to a mix of foreign imitation and autonomous defence innovation, reverse engineering, industrial and cyber espionage to overcome the restrictions imposed on ToT. China benefitted from the import of defence technology (especially from Russia), knowledge from foreign countries and absorption in China's production lines. Close and constant collaboration between the People's Liberation Army (PLA), R&D of the defence industry and industrial institutions throughout the stages of product development.

14. Liberalisation of China's economy not only integrated its civil industry with global R&D and production/supply chains but also assisted in growth of defence industry. Innovative Chinese companies became global brands and tapped into foreign knowledge pools through overseas R&D, mergers and acquisitions: They also gained access to certain sophisticated dual-use technology. Some of the highlights are as under:-

(a) Re-organisation and development of R&D Laboratory systems, which are core components of National Innovation Systems (NIS).

(b) State-owned Enterprises have a major stake in R&D.

(c) Structural simplicity in R&D Labs as follows:-

(i) State Level.

(ii) Provincial Level.

(iii) Municipal Level

(iv) University and Institute Level.

(d) The Science and Technology Institutes structure is as follows:-

(i) **Defence S&T National Laboratories**. This is National-leading innovation centers for strategic, advanced, inter-disciplinary research into defence and dual use.

(ii) **Defence S&T Key Laboratories**. Separate group of state level key laboratories designed to target national defence S&T development needs with access to stable and more substantial government funding.

(iii) **Defence Core Discipline Laboratories**. They are established in universities with a strong track record of academic performance and highly qualified faculty in disciplines related to defence basic science and frontier technologies.

(e) China has greatest number of engineer graduates and PhDs studying in various prestigious universities around the world. They run incentive programs such as the Thousand Talent Plan (TTP). The experts from TP are given bonuses, high salaries and funding, and other benefits such as support with housing and children education.

(f) Chinese citizens studying abroad receive CCP support to spread awareness of TTP-like programs and opportunities in China among potential returnees (reverse brain drain).

(g) Talent 11, Talent 1000, and Talent 10000 initiatives, all aimed at encouraging educate Chinese and scientists to return to China for teaching, research, innovation and start a business.

(n) Defence Industry Ecosystem is heavily dominated by State-owned enterprises.

Key Takeaways

15. In summary, it is apt to say that each Country's Defence Industry though influenced by their unique national circumstances and strategies, all have one common thread i.e. 'State support to Defence Industry' and 'Clear Understanding'

as well as Visibility of Military Requirements by industry and the pivotal role of private industry in defence ecosystem. All these aspects are missing in the case of India or at best, some small measures have only been initiated.

16. Some important measures that we need to allude to are, firstly, the need to chart out an independent path away from the influences of Capitalist West (Private sector model) and Communist China (Government-directed model) that suits our sensibilities and strategic thought. First and foremost, private sector participation is extremely pivotal towards achieving self-reliance. Secondly, the inclusion of academia in all defence industry ventures and thirdly, budgeting support for our defence industry ecosystems to thrive and emerge free from the ambiguity of production orders post successful product development are key takeaways. Also, the best practices of these developed nations need to be imbibed in our policy framework towards indigenisation and Atmanirbharta in defence.

CHAPTER 5

SUGGESTIVE POLICY FRAMEWORK FOR LEAPFROGGING PRIVATE PARTICIPATION IN DEFENCE ECOSYSTEM

1. The defence sector is a monopsony; Govt is the only buyer. In the Indian context, the Government is also the policy maker, regulator, developer (DRDO), Certification and QA Authority {CEMILAC, DGAQA, DGQA etc.) and Producer (DPSUs). Private industry opines that Govt competes with its private industries. Developed countries, that now have strong Military Industry Complexes (MICs), supported local industries extensively (and continue to do so despite being in the top 5 ranks) by way of R&D funds and orders. Post WW II, MICs were restructured and re-aligned towards majority ownership by the private sector. The majority of the top 100 defence companies have private ownership, with minimal Govt share. In India, the defence sector was opened for private sector participation only in 2001. Two decades, down the line, it remains a junior partner, contributing barely 20% of domestic production (but 85% share in exports).

2. The GoI has initiated various policy actions to boost indigenous design, development and manufacture of defence equipment; however, these policies have not provided the necessary traction to the private industries. Based on the questionnaire, detailed interactions and discussions with various stakeholders were undertaken. This part of the dissertation lists down certain recommendations to leapfrog private sector participation in Indian defence industry R&D and manufacturing ecosystem. The key recommendations / suggestions brought out by various stakeholders to leapfrog the private industry participation are given in succeeding paragraphs.

Key Issue No 1 - Enhancing the Private Sector Participation In R&D Including Funding Issues.

3. The first discussion point was towards enhancing the private sector participation in defence R&D including funding issues. The key points brought out during the discussion include: -

(a) The Gross Expenditure on R&D (GERD) has doubled from 2010-11 to 2020-21. However, India's GERD as a percentage of GDP has remained well below 1% since 1990. Most developed countries spend more than 2% of their GDP on R&D, e.g. US (3%), and China (2.4%). India's spending on defence R&D continues to be sluggish over the last five years and accounted less than one per cent of GDP. A strong developed R&D is a strategic necessity. Hence, adequate funding needs to be given for defence research so that military projects are undertaken with full vigour. Allocation of the R&D budget is not sufficient and hence needs a revisit. It is important that the nation incrementally moves towards a target of 2.5% of GDP towards R&D.

(b) DRDO is the premier defence R&D entity. However, considering the capabilities and capacity developed by the private defence industry, a need exists to encourage and involve private industry in defence R&D. DRDO should focus only on niche technologies, security-sensitive projects and complex systems, which are difficult to be addressed by private players. R&D for contemporary technologies should be left, rather reserved, for the private sector. DRDO also requires a re-orientation/ revitalization to improve accountability and productivity.

(c) Since the posts of Secretary DDR&D and Chairman DRDO are being tenanted by the same person simultaneously, there will always be a conflict of interest in allocating R&D funds and projects. Therefore, these posts be tenanted by different persons. Also, there should be representation of Private Industry voice in R&D architecture in MoD.

(d) R&D investments need to be incentivized. It is important that the accounting of R&D in the financials of a company be also discussed with the Ministry of Corporate Affairs and tax holidays be given on R&D expenses.

(e) Today's labour arbitrage needs to be replaced with knowledge and technology arbitrage. Retention of talent, scientists and Subject Matter Experts is paramount for defence innovation and indigenisation. The defence manufacturing and R&D ecosystem of the US is based on proactive engagement to recruit, retain and cultivate talent by offering financial support and various incentives. China also has various incentive programmes such as the Thousand Talent Plan (TTP), Talent 11, Talent 1000, Talent 10000 initiatives, etc. We need to proactively identify and vigorously implement incentive programs and attractive schemes to retain existing talent and encourage reverse migration.

(f) With no visibility of orders, the industry itself is not willing to invest in R&D if there is no business case. All D&D and TDF projects must have a mention of scaling or provide a clear-cut business case to the private industry. Today the industry is capable of hiring world-class talent, and building sufficient infrastructure in case they find a clear-cut business case.

(g) The proposal in the FY 2024-25 budget towards deep technology development funding in defence and an INR 1 lakh crore corpus fund for R & D to promote technological innovation in sunrise sectors (50-year interest-free loan) is welcome. However, more details are required for clarification. Separately, calling and treating it as a loan should be reconsidered as R&D should always be expensed out and not be a liability.

(h) Procedural clarity is required towards implementation of the provision as laid out in the Union Budget whereby 25% of the R&D budget is to be kept aside for private industry participation. The same is being accounted for in terms of projects being awarded to the private sector through TDF, D&D projects, iDEX and Make projects. The same needs to be listed on the MoD website to create transparency in the allocation of R&D budgets.

(j) **Shared Costs Approach**. Incentivising private Industry by moving away Transitioning from the "No Cost No Commitment Approach" to the "Shared

Costs, Shared Gains, Shared Liabilities" model should also be considered. To begin with, the development of the FICV MBT should be initiated along these lines. Incentives for private sector investment in R&D, such as offering tax exemptions and providing infrastructural and technological support, including the hiring of renowned experts, should be explored. the world; duty-free import of all test and laboratory equipment; intellectual property rights and patents should be tradable. etc.

(h) **Operationalising Technology Assessment Cell (TAC).** As per para 5.3 of draft DPEPP, 2020, TAC would provide visibility of Technology Readiness Levels (TRL) available across the country for all major systems/ platforms. In addition, TAC would carry out a scan of regional and global technological capacities and render advice to services for formulating SQR. Periodicity of assessment of technical standards, gaps and visibility of the same. The same needs to be operationalised at the earliest.

(j) **Formulation of Realistic GSQRs**. The need has been identified to objectively review the SQR formulation process so as to convert the operational requirements into realistic specifications, encourage the domestic industry and provide a level playing field to the Indian industry. Spiral development/ phasing of GSQR is a recommended option.

(k) **Promoting IPR**. Aggressive steps to promote Indian IPR like providing tax incentives to Indian firms developing/ acquiring IPR, D&D linked incentives are recommended.

(l) **ToT through Acquisition and Merger**.

(i) Private industries may be encouraged to acquire technology through the Acquisition and Merger of foreign companies/ R&D institutions apart from collaborations.

(ii) Preference to OEMs willing to share quantifiable know-how and know- how, required by Indian industry.

(m) Recent initiatives such as iDEX, iDEX Prime, SPRINT, Meher Baba, and TDF aim to enhance the domestic defence innovation ecosystem, including start-ups. Grants from these schemes should be increased to facilitate more meaningful R&D, and where possible, be fully funded or accompanied by an alternative funding mechanism. Greater funding support approved by the MoD would courage larger participation from MSMEs, start-ups, and innovators, providing a significant boost to science and technology as well as innovation in the defence sector, which would promote greater democratisation of R&D Innovation.

(n) Higher Indigenous Content. Higher IC needs to be incentivised. This can be included in the QCBS system, evaluated upfront and graded for incentivising significantly higher indigenous content (60%, 70%, 80%, 90% or more) beyond the stipulated 50% under the DAP 2020. The bid value of the bidder committing to a higher percentage of indigenisation can be discounted by a certain percentage while determining L1 evaluation.

4. **DRDO Specific Recommendation**.

(a) **Re-defining Role of DRDO**. DRDO may focus essentially on critical & niche technologies while leaving contemporary and simpler technology to the Indian Industry. Aligning the 'Integrated Capability Development Plan (ICDP)' and a detailed consideration at MoD as to who is to develop that technology is therefore essential. Thus, DRDO needs to redefine its role by limiting to only critical, niche and technologically advanced fields, in line with its capabilities and requirements of users and undertake collaborations/ JVs/ ToTs and delink from other technologies. There is a case-in point to analyse DARPA like organisations.

(b) **Cadre Restructuring of DRDO**. The proposal includes a recommendation to induct academicians from Indian institutes of repute on short-term contracts. Further, to address certain cadre shortages, a proposal to approve project-based manpower is also recommended, with personnel being inducted for the period of the sanctioned project and then released, with some percentage being permanently absorbed; A similar mechanism as-in DARPA. This would also assist the private industry in hiring talent being released from DRDO.

(c) **Establishment of Centre of Excellence**. There is a requirement to establish a 'Centre of Excellence' for each identified technology in nominated IITs/ academic institutes etc. While DRDO is focused towards the development of futuristic and path-breaking technologies, utilises private industries for the capability development of future technologies through indigenous solutions/ collaborations with foreign OEMs. Technology with huge capital investment for D&D but with smaller user envelope/ limited public utility be developed by DRDO. Also, during development, at least two DcPPs including one Private Industry be selected for parallel development of two products.

(d) **Project Management Teams**. Project Management Teams preferably led by Service officers to ensure involvement of users including visit by developers to field formations to understand the operational prospect and environment.

(e) **Amalgamation with Academia and R&D**. Research in defence technologies, design and development of the latest weapon platforms cannot be undertaken in silos. Private sector companies need to accredit themselves with the leading Academic institutes (lITs, IISC, DIAT etc) on similar lines as the US companies. This will ensure a captive pool of trained manpower working on the latest technologies.

(f) **Creation of 100% Government Owned Corporate Entity**. Creating a Section 8 Company as per Companies Act 2013 under DD R&D that would merge labs, test facilities and autonomous bodies engaged in test and production of specialist devices/ materials and products.

(g) **Soldier Scientists/ Military Scientists Concept**. DARPA-like agency/ structure in DRDO and integration of Services' elements within the apex and working level structures of the new body be ensured for continued synergy. While young scientists/ talent from universities lead innovation, experienced scientists can undertake mentoring. Also, there is a need to employ M Tech/ PhD students for innovation in niche/ critical technologies.

(h) **Defence R&D**. The decision to allocate 25% of Defence R&D budget to the Industry will be able to give a fillip to the Indian Defence Sector only if the allocation is user-driven and transparent in its allocation. Towards this end, the user i.e. Service HQs must have a major stake in the entire decision-making process. The R&D projects undertaken for the development of technology must lead to the procurement & induction of prototypes. Hence, a suitable provision will need to be inserted into the DAP to close the loop for Service HQs led R&D projects. Financial powers for undertaking R&D under DFPDS-2021 may be further enhanced to provide impetus to R&D ecosystem.

5. **Talent Retention**

(a) **Next Generation Technology Team**. India's Defence innovation and industrial ecosystem, due to the erstwhile import orientation policy of advanced weapon systems/ equipment has missed the design & development of generations of technology. However, technology has a life cycle, and that in no way means that the nation cannot catch up on niche/ critical/ disruptive technologies with advanced nations in due course. So it may appear that we have missed the bus (opportunity). However, considering potential existing in the country and with Govt support, we may excel and outshine other countries. Digital India campaign is the right example of the same. Within a few years, India has not only caught up with the advanced nations but has become a global leader. It is therefore important to accordingly identify the technologies of the future, invest appropriately in such technologies and nurture talent for R&D of such technologies.

(b) **Higher Studies**. M. Tech in Defence Technologies and Weapon System technologies need to be offered by Academic Institutes. The curriculum and syllabi of the same can be prepared by DRDO with the project phase conducted in one of the designated DRDO labs. Research fellowship to include serving defence officers and participants from the private sector should be started by DIAT, Pune (DRDO's training lab and Deemed University).

(c) **Talent Development and Retention**. Instituting a Defence Education Program to include the exchange of Engineers & Scientists and study in foreign universities dealing in defence technology.

(d) **Internship/ Incentive**. DPSUs and Services may offer internships/incentives for Research Scholars involved in projects related to indigenisation or development of niche technology including those from private industries.

(e) Incentive/ Bonus/ Attractive Schemes for Reverse Migration (Similar to China e.g. 100/1000/10000 Talent Program).

Issue No 2 - Recommendation by Private Industry on Make projects, iDEX & PIL.

6. The second discussion point was towards obtaining recommendations by private industry on Make projects, iDeX, PIL and TDF. The key points brought out during the discussion include:-

(a) **Make Projects**.

(i) There is a need to have a relook at Make Projects. Make 1 is 70 % government-funded projects while Make 2 are solely industry-funded. The industry needs a clear-cut business case to be able to undertake spending on R&D. There is a need to increase the number of Make I projects and not have any critical platforms under the Make II category. Also, the minimum order quantity and assured orders for next few years be guaranteed to the company making that investment. Moreover life cycle concept of sustenance by the company developing that product / platform if included in the contract would incentivize the private players as their assembly lines and expertise they hire for that product would remain useable and thus increase the business case viability.

(ii) Procurement timelines need to be adhered to - single vendor cases need to be allowed irrespective of there being a multi-vendor

participation earlier or not, especially in areas where there is very less experience and capabilities within the country.

(iii) Remove any subjectivity or arbitrariness from Make projects is also needed. Other recommendations include increasing government funding in Make-I to as much as 100%. Also any available technology existing with DRDO be shared with the private player undertaking that Make project.

(iv) Having cluster / consortium approach to ensure consolidated infrastructure as well as supply chain.

(b) **IDEX**. iDEX funding pattern needs to be re-examined. Higher than existing 50% grant should be provided based on mile stone achievement. Further mechanism for guaranteed procurement needs to be instituted to ensure support from financial institutions. It is proposed to tie up iDEX with Make I. Also with ADITI scheme launched on 04th March 2024, the grant has been enhanced to INR 25cr. The small industries may not be able to afford as they are also required to bear half the cost and hence it is important that large companies also align themselves with the smaller industries.

(c) **PIL.** Promulgation of PILs provided a major push towards 'Atmanirbharata' and its impact was clearly visible during the interaction with FOEMs and industries during the Aero India-2025. It was noticed that most of the foreign firms and companies had expressed interest of undertaking a JV route with an Indian Partner to give impetus to defence manufacturing in India. However, privately most of these foreign firms want to establish their subsidiaries without undertaking a JV with Indian firms. This would impact ToT as well as joint holding of IPR rights with any Indian Private/ Public firm. The JV route needs to be encouraged to leverage assimilation of technology through a policy framework. The import embargo list cut-off dates need to be realistic as cut off dates particularly in first three lists were quite short for No of items.

Incentivizing The Private Sector Participation In Defence Manufacturing Ecosystem.

7. The third discussion point was towards **I**ncentivizing The Private Sector Participation In Defence Manufacturing Ecosystem. The key points brought out during the discussion include:-

(a) **Long Term Visibility**. Visibility of order and long term commitment in terms of orders is required for support to Large industries as well as MSMEs.

(b) **Easing Procurement Process**. Timelines need to be significantly reduced from RFI stage to award of contract. Long time is taken between trial and procurement, thereby industry capacity remains under-utilized. By the time the product is delivered, about to be delivered, it becomes obsolete/ requires changes in QRs/ there is a new technology. Timelines for approval of drawing/ technical requirements/ technical evaluation format etc are not specified in contract.

(c) **Easing Process of Change in Licence**. Editable license application forms for change in location or name of Defence Company after a detailed scrutiny.

(d) **ERP for new DPSUs**. For streamlining processes, real-time data and reporting, enhanced customer service, increased productivity and better inventory management, enterprise resource planning (ERP) system should be implemented in all new PSUs and any private company undertaking a major defence product.

(e) **Rationalisation of Tax Regime and BGs**. The present taxation regime in the country makes Indian manufacturer uncompetitive and directly works against the Govt's drive of "Make in India". In order to invigorate private industry participation, incentives like tax breaks/ concessions in custom duties, excise duty, VAT & GST, Service Tax and Bank Guarantees need to be offered to private industry albeit maybe for limited period, say five years duration. A few examples of multiple levies are quoted below:-

(i) **Custom Duties**. Customs exemptions on import of goods are typically available only in cases where the MoD or its contractors (private companies) are importers and are unavailable where goods are imported by Indian offset partners. This mitigates Indigenisation policy, as the benefits under these exemptions are not available even to goods imported by subcontractors of foreign OEMs. Appropriate changes to remove this anomaly is needed.

(ii) **Excise Duty**. Similarly, in the case of excise duty, blanket exemption may be considered for supply of goods to the Defence industry under the Government's 'Make in India' campaign.

(iii) **VAT & CST**. While an inter-state sale of goods is subject to Central Sales Tax (CST), intra-state sale of goods is subject to VAT. The CST rate is 2% if the prescribed statutory form (i.e. Form C) is issued by the purchaser. If no forms are provided, the VAT rate applicable in the originating state of the seller will be applicable. For most goods, the VAT rate ranges from 5 to 15% across states. No general exemptions or concessions are available on the sale of goods to Defence sector. Accordingly, the relevant State VAT legislation should be examined and the possibility of special dispensation if required from the State Govt should be explored so that the domestic procurement of goods is economically at par with imports. Participants in India's MRO industry believe that the tax regime needs to change in order to enable India to positioning itself as a MRO hub.

(iv) **Service Tax**. With effect from 01 Jul 2012, the service tax regime in India had undergone a significant change whereby service tax has been made applicable on all services provided in India unless they fall under the negative list or are especially exempt from payment of Service Tax.

(v) **Bank Guarantee**. BGs amount should be reduced. Bank Guarantees(BGs) are required to be given against all stages payments, which amounts to about 85% of the vessel cost, which becomes a huge financial burden to Shipyards in high value projects like warships. The end user (GoI, IN, ICG) have lien over the material/ equipment procured by the yard. Accordingly, the BGs

amount should be reduced to include only labour cost, which would minimise the finance & project costs. There should be provisions for tapering of bank Guarantees as the project advances.

(vi) **Priority Sector Tag**. Currently, there are eight categories under priority sector-Agriculture, Export, MSME, Education, Housing, Social Infrastructure and Renewable Energy. It is recommended by the Defence Industry Association that Defence Sector be included under the priority sector for lending with suitable targets for Commercial banks, foreign banks, Regional Rural banks and Small Financial Banks. By doing so, the Defence sector would get the necessary traction in promoting Self-reliance and thus reducing dependency on foreign imports. It can also help in building strong defence industry that can meet the needs of the Armed Forces and contribute to the country's economic growth.

(vii) **Exemption under Manufacturing and Other Operations in Warehouse (MOOWR Scheme)**. To build up capability and capacity, considerable capital investment is required by the private Defence industry. Hence, for all capital goods for Defence business, it is recommended to consider either custom duty waiver for next three years or IGST payment waiver under MOOWR Scheme.

(viii) **Advance for EP Tender**. In case of EP tender, where deliver period is short, advance of 15% is not sufficient, hence advance payment of 30% may be considered. Adequate advance payment for emergency procurement in Defence Tenders would be a useful mechanism to expedite the procurement process and ensure timely delivery of critical equipment and services to the Armed forces.

(ix) **Build-to-Print Vs Build-to-Specifications**. A major segment of the Indian Industry has emulated the Build-to-Print model of DPSUs and sees it as a economical method to produce military hardware based on production technology without adequate investment in seeking know-how or Build-to-specfication capability. While this approach is helpful in setting up an industrial eco-system, its growth and advancement gradually needs home grown IP and know-how.

Therefore. going forward, a concerted approach and policy push is recommended to migrate from BUY (Indian) to BUY (Indian-IDDM).

(x) Support and guidance of PSUs is required for integration of equipment into platforms and the services can facilitate collaborations.

(xi) Industry faces challenges in investing in R&D and amortizing its D&D cost as it loses out to another company which has tied up with a FOEM who already have an established supply chain for the product line. Hence this issue also needs to be looked into.

Issue No 4 - Ensuring Level Playing Field For Private Defence Industries

8. The fourth discussion point was towards ensuring level playing field for private defence industries in line with Foreign Original Equipment Manufacturer (FOEM) and DPSUs to build trust in Indian Industry. DDP ex control over DPSUs therefore there is a protective environment to DPSUs. Order books of most OFs & HAL are overbooked leading to delay in deliveries and also leading to critical voids in capability of defence forces. Also the acquisition mechanism needs to function w/o undue influences by DRDO & DDP. Rather these organisations need to handhold and extend use of their facilities to the Private Sector. Some of the recommendation wrt the as under :-

(a) All acquisition cases should be open to industry on competitive basis with no option of nomination to DPSUs.

(b) In case where technology is available with DPSUs / AHSPs /DRDO, sharing of load of DPSUs through pursuing JV model between DPSU / OFs and domestic private players identified through a detailed procedure. This would not only bridge the demand supply gap but would also catalyse the domestic defence-manufacturing sector, and create surge capability as well as promote exports. The contract should be split 60:40 between DPSU and private industry partner.

(c) In case where ToT is being sought, nomination route should be done away with and all such contracts should be decided through open bidding. This would facilitate aggressive participation of domestic players in the field of defence manufacturing.

(d) The preferential treatment to DPSUs in terms of customs duty exemption, ERV and payment to DPSUs as per incremental milestones should be done away with so as to provide a level playing field.

(e) Both DAP and DPEPP should include empowering provisions and innovative approach to provide level playing field to the Private Sector to make them equal partners in design, development and manufacturing of military equipment.

(f) While the industry is willing and interested in IGA / G2G cases, it is important that payment terms are also looked at. It is important that the domestic industry also be treated at par with the FOEMs even when it comes to payment terms as well.

(g) Conflict of interest need to be addressed, especially at MoD level, when it comes to procurement cases being evaluated for imports or for domestic sourcing.

Issue No 5 - Mapping Of R&D And Defence Manufacturing Capability Of Private Industry.

9. The fifth discussion point was towards mapping of R&D and defence manufacturing capability of private industry. Competency mapping of private defence Industry to establish their core competency/ capabilities is also proposed. FICCI, SIDM, DRDO and DPP to facilitate and enable Private industries towards specialisation in core verticals. Competence and capability be given due weightage in selection process rather than L1 model. Major defence industries be nominated as tier 1(Aggregators) while mid-level industries (Tier II) & MSMEs (Tier III). The key points brought out during the discussion include:-

(a) There was a consensus on the need for mapping of the defence industry; both for procurement within as well as for exports and a regularly updated database of the ecosystem in India.

(b) The industry's apprehension on sharing their know-how is also appreciated and therefore the software so developed for collation of data will need to be worked out to an acceptable framework so that industry apprehensions are taken care.

(c) The exercise is time and manpower intensive, and hence requires a platform like SIDM integrated with a specialised agency to collate this data. However, it would require some funding and legal / official authority to do so.

Issue No 6 - Development, Management And Enhancing Private Sector Participation In Defence Industry Corridor (DIC)

10. The sixth discussion point was towards development, management and enhancing private sector participation in Defence Industry Corridor (DIC). The Govt of India has established two defence corridors as part of self- reliance and to enhance export potential in defence manufacturing. The enthusiasm and participation of domestic defence industry is still not commensurate to the mission. The key points brought out during the discussion include:-

(a) No special incentives are available in terms of land cost, electricity, water, and other such facilities for industry set up in the DICs

(b) The concept of domain centric Industry Corridors is very prevalent in several sectors of economies, and globally. The key therefore is the scale and synergy for the participating industries; example, automobile manufacturing, diamond cutting / polishing, textiles, electronics etc. It is easy to identify this kind of cluster or corridor in our own country too. Therefore, anchor industries (Large, Equipment or platform manufacturers) and their lower tiers are in the vicinity to build an efficient, interdependent supply chain. All supporting industries

transportation, banking, test facilities, certification agencies, ITES providers, Contractors for labour etc., also get localized to fulfil the broad needs of the Corridor or cluster, whatever term we may use. Therefore, it is recommended that Defence Industry Corridors are domain centric. There is need to differentiate between Anchor Industries and lower Tiers; anchor industries would attract lower tiers. Therefore, additional incentives need to be extended to anchor industries. A dynamic Defence Industry Corridor {defence industry ecosystem comprising OEMs, Platform Integrators and Tiered industries} requires continuous business to sustain. Government needs to take steps to facilitate industry towards establishment of domain centric defence corridors.

(c) **Additional Corridors**. There is a case in point to examine feasibility of establishing additional defence corridors based on services requirements and facilities available (R&D, trail and testing facilities etc). In case such facilities of GoI are located in any cluster, the same becomes an incentive and would thereby attract private sector participation. The recommended additional DICs are as under:-

(i) **Karnataka**. Around Banglore for aviation and defence electronics.

(ii) **Maharashtra**. Around Pune for land mobility, artillery, heavy engineering systems - bridges, launchers for missiles, rockets etc.

(Iii) **Telangana**. Around Hyderabad for aviation, missiles, UAVs and defence electronics.

(iv) **Madhya Pradesh**. Around Nagpur for ammunition, MRO for transport aircraft.

(v) **J&K and Punjab**. Around Udhampur-Jammu-Pathankot-Jalandhar area for MRO facilities for land and air systems.

(vi) **Assam**. Around Guwahati for MRO facilities for land and air systems.

(vii) **Coastal States**. For maritime systems.

Issue No 7 - Trials, Testing and QA Issues

11. The seventh discussion point was towards Trials, Testing and QA issues. To ensure robustness of QA process, which is essential both for quality and efficiency of defence eco-system as well as to gain confidence of international clients, India needs an overhaul of DGQAIDGAGA organisation. This aspect has been adequately highlighted in various high level committees set by the Govt. The trial stage in all defence acquisitions remains a major contributor to delay in acquisition, complaints, and litigations; negating ease of doing business for domestic industry vis a vis practices followed for FOEMs / G2G / IGA acquisitions. Despite several procedural reviews by MoD, procedures continue to be archaic & time consuming besides unviable expenditure on participants. The key points brought out during the discussion include:-

(a) There were numerous issues listed which indicates that while much has been done, there is still lot of work to be done such as simplification of trial process to reduce timelines, cost / automation/ incorporating international norms etc.

(b) Self-certification, digitisation and single window clearance systems need to be implemented.

(c) DGQA clarified and highlighted that reforms in policy and procedures have been considered and will be promulgated shortly, which will bring a sea change.

(d) The entire ToT and QAP process was highlighted as a time taking process and hence was suggested to have one agency that acts as the key facilitation cell and to leverage technology to process and approve documents.

(e) A “remote QA model” is in the final stages of implementation whereby repeated physical inspections will be reduced.

(f) It is important to soon operationalize the labs being set up by the QA agency towards trial and testing of components that make the product as well. Three such labs are being set up in India.

(g) From a data point of view :-

(i) 17 firms, 49 equipment and almost 16000 products have been approved through self-certification.

(ii) 116 equipment and almost 3000 products have been approved under green channel certification.

(j) **Simplifying Inspections at par with FOEMs**. As part of the QA process, factory visit and inspections of manufacturing processes for Indian companies results in long lead times/excess documentation etc. In the case of FOEMs, only factory pre dispatch inspection/ acceptance trials are undertaken. Similar procedure should be followed for Indian industry as well.

(k) **Facilitation in Trials & Testing**. Utilisation of Govt test facilities by the Private Industry, self-certification/certification from accredited labs and facility for in-situ repair of equipment are some of the issues identified to simplify the trial process and facilitate private industry. Industry had highlighted setting up of six/ eight green-field testing facilities under Defence Testing infrastructure Scheme (DTIS) which could be hastened. Until such facilities are created, the Armed Forces should continue to support testing needs through its own facilities apart from those with DRDO and DPSU. The Greenfield facilities under DTIS could be established in Defence Industrial Corridors (DICs) of Uttar Pradesh and Tamil Nadu or Defence Research/ Academia and Industry Clusters in Gujarat, Madhya Pradesh, Andhra Pradesh and Maharashtra, etc. as these would greatly help the defence R&D. Also, mapping & matching of product development with testing infrastructure as part of Defence Corridor be carried out

by DDP. Even JV/ Tie-up with foreign OEM/ foreign Govt agencies for trial & testing labs, be considered.

Issue No 8 - Challenges regarding Srijan Portal

12. The eighth discussion point related to challenges regarding Srijan portal. The portal faces a significant challenge of limited awareness among the industry. The Department of Indigenization, responsible for identifying items for localization, is struggling with disseminating information effectively. Development of items calls for D&D in low volumes, but does not highlight substantial opportunities for industry to be interested in it. The focus on EOQs is skewed, requiring Indian firms to invest significantly in R&D towards import substitution, while FOEMs need to allocate only a fraction of their existing manufacturing line. There is also a lack of outreach after product development, with issues surrounding adherence to timelines and budgetary constraints. The industry's disinterest in smaller sustenance parts further compounds the challenges. The key points brought out during the discussion include:-

(a) To address these challenges, it is essential to enhance the dissemination of information about Srijan and the Department of Indigenization to generate greater awareness. Engaging in national seminars, will provide a platform to showcase Srijan.

(b) Emphasis should be placed on showcasing significant opportunity size as well as the import price (where possible) on the portal.

(c) Reviewing Economic Order Quantities (EOQs) can encourage Indian firms to invest more in R&D, aligning with FOEMs. Establishing a separate Indian chamber for regular press briefings, such as at Sena Bhawan, can contribute to increased interest and participation. The alteration of Minimum Order Quantities (MOQs) by the Indian Navy, suggesting 3-5 year demand framework for same product form same buyer, offers a positive precedent for encouraging similar changes for all services and their product demands.

(d) Showcasing import prices on the portal can facilitate business case understanding for the industry who have the capabilities.

Key issue No 9 - Draft DPEPP 2020 & Defence Exports.

13. The eighth discussion point related to Draft DPEPP 2020 & Defence Exports. The vision of DPEPP is "To make India among the leading countries of the world in the defence sector, including Aerospace and Naval Shipbuilding sectors, from design to production, with active participation of public and private sector and thus fulfilling the twin objectives of self-reliance and exports". Some of the recommended measures to leapfrog private industry participation and boost exports are listed below:-

(a) The policy document needs to be promulgated at the earliest.

(b) Transparent system needs to be put in place to facilitate private sector to undertake direct business with friendly foreign counties.

(c) Creation of autonomous FMS like organisation to coordinate defence exports.

(d) Reforms in LoCs for defence procurement by FFCs.

(i) Process from awarding the LoCs to operationising the contract needs to be expedited.

(ii) Provision for re-purposing LoCs for defence procurement should be made.

(iii) Provision of 75% indigenous content in case of procurement by FFCs through LoCs should not be insisted upon.

(iv) Items under defence line of credit to be nominated.

(e) **Financing Support for Exports**.

(i) Exploring ways of financing defence export through Commercial Banks of the importing countries.

(ii) Need for mechanism for identification of reliable channel partner in FFCs.

(iii) A funding mechanism to provide an affordable credit line may be established.

(f) **Brand India**. Promotion for all indigenous Defence Products abroad.

(g) **Export Promotion Council**. Creating Export Promotion Body to promote Indian Defence Industry abroad.

(h) **Export Authorisation**. Export authorisation for propellant/explosives should also be given by DDP instead of DGFT. Provisions of End User Certificate format may be re-examined in line with other countries. Collegiate mechanism for rejecting export applications is also recommended.

(j) **Export Logistics**.

(i). Special purpose Cargo vessels be designed and developed for transportation of defence goods.

(ii) Possibility of air transportation be explored for export of arms and ammunition.

(k) **Export Support and Incentivisation**. Exports of indigenously designed and developed products should be incentivised by the Govt.

(l) **Duty Drawback Scheme for Defence**. Benefit of duty drawback Scheme be extended for defence products.

Issue No 10 - Enhancing Understanding and Interaction between Stakeholders

14. The tenth discussion point related to Enhancing Understanding and Interaction between stakeholders and sharing Information with Industry.

(a) **Sharing Information with Industry**. To ensure that Private Industry understands the needs of defence forces, Technology Perspective

Capability Roadmap (TPCR), Annual Acquisition Plan (AAP) and ICDP of the Services could be made more transparent. Following are recommended :-

(i) Post intelligence/ security clearance, list of high priority schemes/projects indicating approximate acquisition quantity along with likely procurement time lines could be shared with the industry.

(ii) Def Expo/ Aero India should be used as platforms for interaction between field commanders and industry partners to help align later with the operational requirements of Services.

(iii) Regular visits by Industry partners/ academia to field formations for operational exposure to understand the needs on ground could be instituted.

(b) **Coherence**.

(i) **Committee of Stakeholders**. Various organisations exist in the domain of defence industry, these include Service elements such as ADB, DOI, NIIO, DISB of DRDO as well as industry associations such as SIDM, ASSOCHAM, CII and FICCI. It is recommended that a collegiate committee of these stakeholders be formed to guide industry on various initiatives such as iDEX, SPRINT, Meher Baba, etc. as well as channelize the budget provisions for indigenisation and R&D. If a quarterly meeting in any formal forum is organised, outputs will enhance.

(ii) **Organisation to Guide DICs**. In order to guide the industry in DICs and develop requisite capabilities, it is recommended that the state Govt establish organisational structures including linkages with SIDM, SHQs and DISB (DRDO). DICs may also be constituted as corporation so that they can become part of SPV of GoI schemes. DIC CEOs and officers should also operate independently of any other state machinery, responsibility and not be part other industrial or developmental authority or agency in the state Govt.

(c) **Establishment of Joint Services Industry & Innovation Cell (JSIIC)**. Presently in MoD, DDP is responsible for matters pertaining to defence production, indigenisation, planning and control of DPSUs (para 13 of AoB Rules 2017, states 'Indigenisation, development and production of defence equipment and participation of private sector in the manufacturing of defence equipment. Presently, in DDP, there is a JS (DIP) with DDG, Indigenisation and requisite subordinate organisation to promote indigenisation and Private Defence industry. However, there is a clear conflict of interest on two accounts; one Defence Production by DPSU and Quality Assurance is under same vertical; two, DPSUs need to meet financial targets and therefore the DDP in a way is at conflict of interest with the aspirations of Private Defence Industry as DPSUs get preferential treatment. To offset this conflict of interest it is pertinent that Quality Assurance and Participation of Private industry in defence equipment are transferred to DMA thereby enhancing QA standards, Invigorating Private Industry and giving competitive environment to DPSUs. To achieve the same, there is a requirement to establish a Joint Services Industry & Innovation Cell (JSIC).

Miscellaneous

15. **Dedicated Defence Industry**. There is a definitive need to earmark a dedicated defence industry on the lines of US & France defence industries like Lockheed Martin, Northrop Grumman, Dassault Aviation and Thales respectively. Currently the big players like TATA, Adani, Mahindra have defence vertical as a sub-set of their business which is spread into other sectors. Defence specialisation companies have to be specifically registered to assure the existence of a domestic defence manufacturing landscape.

16. **Raw Material Availability**. The non-availability of raw material is a major constraint in Indigenisation. Creation of a certifying agency for using , alternate materials having same properties and parameters in defence manufacturing may solve the issue.

17. **Additional Cost for Indigenisation**. Due to non-supply of any item from FOEM/vendor, there would be a requirement to indigenise the same. The developmental cost of indigenisation with respect to any project needs to be catered to, as additional cost implication to the yard.

18. Overall, revitalising the Indian defence industry requires a coordinated effort. Govt support in fine-tuning policy framework, providing guidance and incentivisation will help Indian defence industry to provide quality equipment to facilitate operational capabilities of Indian Armed Forces, thereby achieve Atamnirbharta targets and increased revenue generation.

CHAPTER 6

CONCLUSION AND RECOMMENDATIONS

Summary of Key Findings

1. The research underscores the critical need for self-reliance in India's defence sector, particularly by enhancing private sector participation in defence R&D and manufacturing. The key findings given in the succeeding paragraphs highlight the challenges and opportunities in this domain as well as list out key recommendations to invigorate private sector participation.

2. **Dependence on Imports**. India continues to be one of the world's largest importers of defence equipment despite various policy measures aimed at promoting indigenous production. The reliance on foreign suppliers not only affects national security but also increases fiscal burdens. While the government has taken steps to curb this dependency through large number of initiatives, the progress has been slow due to supply chain limitations and technological gaps.

3. **Limited Private Sector Participation**. Despite policy interventions such as revision of Defence Procurement Procedure (DPP) and new Defence Acquisition Procedure (DAP), the participation of private firms in defense R&D and manufacturing remains constrained. Large public sector entities, particularly Defence Public Sector Undertakings (DPSUs) and the Defence Research and Development Organisation (DRDO), dominate the sector, leaving little room for private enterprises. The lack of assured long-term contracts and inadequate access to government projects further deter private investments.

4. **Challenges in Policy Implementation.** Although flagship initiatives such as Make in India and Atmanirbhar Bharat have been introduced to promote domestic manufacturing, bureaucratic delays, lack of clear policy guidelines, and stringent compliance requirements hinder their effectiveness. Delays in project

approvals, procedural inefficiencies, and insufficient financial support have limited the tangible outcomes of these policies. Greater coordination between policymakers and industry stakeholders is necessary to bridge these gaps.

5. **Inadequate R&D Investment.** India's defense R&D is predominantly led by public sector entities like DRDO, with minimal involvement from private firms. The lack of significant funding opportunities, weak collaborative frameworks, and limited financial incentives discourage private companies from investing in cutting-edge defence technologies. Comparatively, countries such as the USA and Israel allocate a substantial portion of their defence budgets to R&D, ensuring continuous technological advancements and innovation.

6. **Infrastructure and Industrial Corridors.** The establishment of defence industrial corridors in Uttar Pradesh and Tamil Nadu represents a positive step toward fostering indigenous defence production. However, these corridors require significant investment in infrastructure, clear policy frameworks, and enhanced connectivity to attract private firms. In addition, easing land acquisition processes and providing fiscal incentives could further encourage industrial participation.

7. **Slow Pace of Indigenization.** While the introduction of Positive Indigenization Lists (PILs) aims to reduce foreign reliance by mandating domestic production of specific defence items, the actual pace of indigenization remains sluggish. Key challenges include supply chain inefficiencies, technological know-how gaps, and a lack of advanced manufacturing capabilities. Strengthening domestic defence ecosystems through skill development programs and incentivizing indigenous innovation is essential for long-term self-reliance.

8. **Lack of a Level Playing Field.** DPSUs continue to have a dominant role in defence procurement, limiting opportunities for private sector firms. The current procurement framework does not provide a level playing field for private defence industry, SMEs and start-ups, which struggle with financial constraints and regulatory complexities. Encouraging public-private partnerships, easing entry

barriers, and implementing preferential procurement policies for private players can help create a more competitive defense manufacturing ecosystem.

9. **Best Practices from Other Nations**. Countries like the USA, Israel, and South Korea have successfully integrated private sector participation in defence manufacturing through structured policy support, financial incentives, and well-defined R&D ecosystems.

(a) **United States.** The U.S. defence industry thrives on extensive private sector involvement, supported by research grants, tax incentives, and robust public-private partnerships.

(b) **Israel.** Israel has fostered a strong defence technology ecosystem by encouraging start-ups and SMEs to participate in defence innovation, facilitated by government-backed funding programs.

(c) **South Korea.** South Korea has successfully built a self-reliant defence sector through strategic government investments, localized production, and incentives for private sector engagement.

Imporatant Recommendations to Policymakers and Stakeholders

10. While detailed recommendations have been listed out in Chapter 5, the summary of key recommendations and suggestions to be incorporated in the current policy framework are listed in succeeding paras. The same if implemented would provide a major push towards private sector participation in defence R&D and production thereby achieving self reliance goals of the nation.

11. **Increasing Private Sector Participation in R&D (Including Financing)**.

(a) **Increase Allocation of R&D**. The government should raise defence R&D spending incrementally to at least 2.5% of GDP to align with international norms and support strong indigenous development.

(b) **Reform DRDO's Role**. DRDO may work only on niche and key technologies while R&D on contemporary, existing and modern technologies must be left to private industry. This will avoid duplication of efforts.

(c) **Independent R&D Governance**. The roles of Secretary (DDR&D) and Chairman (DRDO) need to be divided and there appointments need to be tenanted by different persons so as to prevent conflict of interest in private industry allocation of R&D funds.

(d) **Tax Incentives & Funding Clarity**. Defence R&D should be granted tax holidays, and the 25% budget allocation and utilisation for private industry for R&D needs to be clearly posted on the MoD website.

(e) **Fostering Talent Retention**. Adopt systematic talent retention schemes (e.g., monetary benefits, career advancement, and scholarships) like China's Thousand Talent Plan.

12. **Overhauling Make Projects, iDEX & PIL**

(a) **Redirect Priority to Make-I Projects**. Raise the share of government funding to 100% for Make-I projects to give more financial assistance to private companies.

(b) **Mandate Procurement Guaranteed**. Have all Make and iDEX projects have an unmistakable business case with secured orders to reward private sector investment.

(c) **Shorten Procurement Cycle**. The process of procurement should be streamlined not to delay awards and single-vendor cases.

(d) **Increase iDEX Financing**.Increase the iDEX grant above 50% of financing, to enable private industries to fund extended-term R&D efforts.

13. **Encourage Private Sector Joining Defence Production**.

(a) **Ensure Long-term Visibility**. Government must offer order guarantees for the next 5-10 years to induce infrastructure investments by private companies.

(b) **Reduce Taxes and Duties**. Implement custom duty waivers, tax exemptions, and relief on R&D costs for a minimum of five years.

(c) **Prioritize Defence in Banking**. Defence industry must be classified under "priority sector lending" to ensure easy availability of capital.

(d) **Flexible Licensing for MSMEs**. Streamline defence licensing conditions for private players so that they can enter and leave projects without unduly bureaucratic barriers.

14. **Ensuring a Level Playing Field for Private Enterprises**

(a) **Eliminate Preferential Treatment to DPSUs**. Every procurement case needs to be opened to private sector competition, and DPSUs must not be accorded special treatment like exemptions from customs duty.

(b) **Ensure Equitable Assessment**. The L1 (Lowest Cost) approach needs to be amended to a Quality-Cost-Based Selection (QCBS) method to incentivize greater indigenous content.

(c) **Public-Private Partnership**. Promote joint ventures (JVs) among DPSUs and private enterprises for technology and knowledge sharing.

15. **Private Sector Capability Mapping and Development**

(a) **Create an Industry Competency Database**. SIDM, FICCI, and MoD must have a mapping of private sector capabilities.

(b) **Establish Industry Tiers**: Classify companies into Tier-I (aggregators), Tier-II (mid-tier), and Tier-III (MSMEs) to promote equitable participation and specialization.

(c) **Establish Certification Standards**. Introduce standardized quality certifications to enhance confidence in defence equipment produced by the private sector.

16. **Defence Industrial Corridors (DICs) Strengthening**

(a) **Provide Financial Incentives**. Offer subsidized land, power, and infrastructure for units establishing in DICs.

(b) **Domain-Centric Corridors**. Establish sector-specific DICs (e.g., Bangalore for aerospace, Hyderabad for missiles/UAVs, Pune for land mobility).

(c) **Enhance DIC Locations**. Look at creating more corridors for eg Nagpur (Ammunition), Jammu (Land systems MRO), and Guwahati (Air systems MRO) and Banglore for aerospace and electronics.

17. **Enhancing Trials, Testing & QA**

(a) **Self-Certification for Private Companies**. Similar to FOEMs, permit domestic companies to self-certify defence items rather than facing long DGQA procedures.

(b) **Speed up Testing Infrastructure.** Develop 6-8 greenfield testing labs under the Defence Testing Infrastructure Scheme (DTIS).

(c) **Incorporate Remote QA Models**. Minimise physical checks by way of AI-driven automated quality testing.

18. **Overcoming Challenges with the Srijan Portal**

(a) **Raise Awareness and Accessibility**. Host national seminars and workshops to make industry stakeholders aware of the Srijan portal.

(b) **Enlarge EOQs for Business Viability**. Adjust Economic Order Quantities (EOQs) to make R&D investments feasible for private companies.

(c) **Display Import Prices**. Highlight import price benchmarks for defence products on Srijan to enable private players to put in competitive bids.

19. **Spurring Defence Exports (DPEPP 2020)**

(a) **Rapid-roll-out Policy Promulgation.** DPEPP 2020 must be finalized at once to give well-defined guidelines for private sector engagement.

(b) **Establish an Independent Defence Export Agency**. An FMS-type agency must be instituted to facilitate and encourage exports.

(c) **Provide Export Financing**. Extend credit lines and financial incentives to Indian companies engaged in the global defence market.

(d) **Relaxing Defence Line of Credit (LoCs).** Do away with indigenous content requirement for defence exports through LoCs.

20. **Increasing Stakeholder Collaboration and Transparency.**

(a) **Share Defence Acquisition Plans with Industry**. Make the Technology Perspective & Capability Roadmap (TPCR), Annual Acquisition Plan (AAP), and ICDP more transparent.

(b) **Improve Inter-Agency Coordination**. Establish a Joint Services Industry & Innovation Cell (JSIIC) in order to dismantle bureaucratic obstacles.

. (c) **Encourage Public-Private Dialogue**. MoD, industry leaders, and DRDO must conduct regular quarterly forums to monitor indigenization objectives.

Conclusion

21. India's goal of attaining defence manufacturing self-reliance is ambitious but vital for boosting national security, strategic independence, and economic development. Much has been accomplished through initiatives such as Make in India and Atmanirbhar Bharat, yet numerous structural, monetary, and policy-related barriers still prevent the full involvement of the private sector in defence R&D and production. These issues are best addressed by a long-term, targeted strategy that follows global best practices but safeguards India's distinctive strategic interests.

22. The secret of leapfrogging private sector defence participation is hidden in funding transparency, policy lucidity, accelerated procurement, pecuniary incentives, industry co-operation, and a bettered regulatory environment. If these proposals are adopted, India can change its defence establishment from an import-based to an indigenous, competitively globalised Military-Industrial Complex (MIC).

23. A strong and indigenous defense sector is an essential support of national security, minimizing the need for foreign imports and maintaining readiness during periods of geopolitical instability. For all its ambitions, India is one of the world's biggest importers of defense hardware. The sluggish rate of technology transfer, absence of an effective procurement system, and few incentives for private players have hindered progress. Although efforts like the Defence Procurement Procedure (DPP) and the Defence Acquisition Procedure (DAP-2020) have brought about reforms, their impact has been limited by bureaucratic inefficiencies, uneven implementation, and insufficient funding for private-sector R&D.

24. To accelerate the transition toward self-reliance, a holistic, multi-dimensional approach is necessary. This includes policy reforms that streamline procurement processes, increase transparency, and promote greater synergy between public and private sector entities. Strengthening institutions like DRDO, while simultaneously fostering private-sector innovation through dedicated R&D incentives, will be crucial. Countries like the US, Israel, and South Korea offer valuable lessons, demonstrating how proactive government intervention can cultivate a globally competitive defense industry.

25. A successful public-private partnership is key to making self-reliance a success. Creating an equal playing field for private industries, facilitating ease of doing business, and avoiding unnecessary bureaucratic red tape will inspire additional investment in domestic defense manufacturing. MSMEs and start-ups, more so than anyone else, ought to be afforded important roles to play, for they can provide nimble drivers of innovation which augment the operations of larger defense manufacturers. Initiatives such as Innovations for Defence Excellence (iDEX) must be increased and integrated with defense procurement policy more effectively so that the process of moving from prototype development to mass production can be a smooth one.

26. India's role in the international defense market is another area of importance for future growth. By developing a strong export-oriented defense industry, India can move from being a large importer to a large exporter of cutting-

edge defense systems. Augmenting strategic alliances with friendly countries for collaborative development, shared production, and technological agreement will allow India to build advanced defense solutions in fields like cyber warfare, artificial intelligence, and autonomous weapon systems. This will establish not only a stronger defense capability of India but also make it a dominant force in the global defense economy.

27. Setting up Defense Industrial Corridors (DICs) in Uttar Pradesh and Tamil Nadu is a big step towards defense industrialization. But these corridors need to be seamlessly integrated with international supply chains, enabled by world-class infrastructure, and supplemented by unambiguous long-term investment policies to make them attractive for domestic as well as foreign players. Promoting FDI while keeping strategic protection intact will assist in building key defense technologies and ensure India is not lagging behind in the fast-changing global defense sector.

28. India's military modernization needs to be closely tied to the larger objective of becoming self-reliant. This means not just producing current weapons systems but also investing in cutting-edge technologies like hypersonic missiles, space-based defense systems, quantum computing, and directed-energy weapons. Technological sovereignty in these domains will be essential for sustaining strategic deterrence, increasing force readiness, and ensuring India's long-term defense interests.

29. Finally, the journey to self-reliance must be pursued with unflinching determination from all parties involved—government, industry, academia, and research institutions—to create an environment that encourages ongoing innovation, builds industrial capability, and enhances India's defense capabilities. The appropriate policy mix, investment, and collaboration will play a crucial role in driving sustainable defense sector growth.

30. With a clear strategy, effective implementation of policies, and robust sectoral collaboration, India can shift effectively from its role as an important arms-importing nation to an autonomous, world-class defence manufacturing powerhouse. The realization of this objective shall not only provide strength to the

national security mechanism but also result in high-employment opportunities and skills, contribute to technological leapfrogging, strengthen economic buffers, and catapult India to prominence as a respected force in global defense production.

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Appendix A

QUESTIONNAIRE

1. **Issue No 1 - Enhance Private Sector Participation in R&D including Funding Issues.**

(a) Is the present system of Govt funding through R & D Budget conducive to private defence industry growth?

(b) Does the 2024-25 budget proposal of deep technology development funding in defence and 1 Lakh crore corpus fund for R & D to promote technological innovation in sunrise sectors (50 year interest free loan) gives impetus to industry's willingness to participate in R & D for indigenization/ self reliance?

(c) Does DRDO steered/controlled procedure meets industry aspirations especially Dr Saraswat committee proposal under circulation? What are industry comments?

(d) Should Govt also lay down a specified mandatory % of expenditure in R & D in indigenous Projects?

2. **Issue No 2- Recommendation by Private Industry on Make projects, iDEX, PIL & TDF.** While there have been numerous policy enunciations, however, hardly any projects have fructified under Make1, whereas most of the projects find path through D & D under chapter IV through DRDO/DPSUs.

(a) What does industry suggest the right approach to enhance procurements under Chaper III ie Make Procedure including iDEX and TDF? Aspects wrt % of funding in Make 1 & iDeX, selective funding of Make II and

enhanced funding of MSMEs, startups and incubators etc may be commented upon.

(b) How can PIL be made more effective and industry friendly ! Any suggestions ?

3. **Issue No 3 - Incentivising Private Sector Participation in Defence manufacturing ecosystem.**

(a) Industry spends a lot of effort in time and funds in defence projects, however, probability of assured orders and time taken for such projects under NCNC model , does not instil confidence? What are the ways defence manufacturing eco system can be made more viable and lucrative for domestic defence industry?

(b) What are your specific views on NCNC participation, tax concessions, incentives for selected vendors other than L1 including advantages for participation in subsequent/ similar projects etc?

(c) Does the financial incentivisation model for enhanced Indigenous Content (IC) & Indigenous Design (ID) to industry boost indigenisation/self reliance?

4. **Issue No 4- Ensuring Level Playing Field for Private Defence Industries in line with Foreign Original Equipment Manufacturer (FOEM) and DPSUs to build trust in Indian Industry.**

(a) Despite several initiatives by Govt of India/MoD in this regard, there continues to be perception that Indian industry despite having matured and showcased their established capability in defence manufacturing, are not given due opportunity and level playing field for competitive bidding. It is either nomination or IGA/G2G along with DPSUs; which goes against the

basic principle of self- reliance and Atama-nirbharta. What are industry recommendations for level playing field?

(b) How does domestic industry assure capability, quality and responsibility as is generally done for FOEMs & DPSUs? What are industry recommendations?

5. **Issue No 5 - Mapping of R&D and Defence Manufacturing Capability of Private Industry**

(a) Mapping of R&D and Defence Manufacturing Capability of Private Industry is an essential step for understanding indigenous capability and enhancing acquisition and exports. However, incomplete data is available in piecemeal and segmented with various agencies. There was an initiative by

NSCS to map the industry, through a professional agency (Primus Partners) however, it did not materialize due to lack of cooperation from various stakeholders for data security, official mandate of the agency and the effort involved.

(b) What are industry recommendations to ensure this data compilation is completed, also recommend what all inputs which can be shared by the industry?

6. **Issue No 6 - Development, Management and Enhancing Private Sector Participation in Defence Industry Corridor (DIC)**. The Govt of India has established two defence corridors as part of self- reliance and to enhance export potential in defence manufacturing. The enthusiasm and participation of domestic defence industry is still not commensurate to the mission.

(a) How does industry feel that Development, Management and Enhancing Private Sector Participation in Defence Industry Corridor (DIC) can manifest as per vision? Industry may especially comment on incentives, procedural bottlenecks, trials and testing, advantages in procurement process or management and state Govt role in such a venture?

(b) Should the DIC be based on Core groups or sub- group clusters in regions adjacent to DIC? Or should the Govt create mini clusters based on grouping of similar equipment-based capability/requirement in other states?

7. **Issue No 7 - Trials, Testing and Quality Assurance Issues**. The trial stage in all defence Acquisitions remains a major contributor to delay in acquisition, complaints, and litigations; negating ease of doing business for domestic industry vis a vis practices followed for FOEMs/ G2G/IGA acquisitions. Despite several procedural reviews and amendments by MoD, the procedures continue to be archaic and time consuming besides unviable expenditure on the participants.

(a) Which aspects of the existing process for testing and evaluation are considered /construed as impediments?

(b) What are your expectations as a designer, from the armed Forces in terms of facilitating testing and evaluation of an equipment developed by you?

(d) Is there a requirement to have a “Private Industry Coordination Cell” that would act as a single window for interaction with private vendors to evaluate proposals /products and provide guidance for prototype development ? What role do you see of such a Coordination Cell? Does the industry have sufficient capability to undertake the tests as mandated by existing military standards? If there are shortfall, list out specifics?

(e) In your opinion what percentage of cost of the project is nominally spent towards testing and evaluation? How do you propose to reduce these costs?

(f) What guidance /handholding would you expect from Armed Forces during D & D Phase?

(g) Acceptance of industry certification & simulated inputs for non-essential operational parameters- procedure for DGQA approval of industry authorised to certify?

(h) Whether QA needs to be part of manufacturing/ production stages or canindustry take on responsibility and accountability for their products, and QA agencies only come into play only at actual trial stage.

(j) Should DGQA/DGAQA and CEMILAC be under Secy DP/ Secy DDR&D/ Secy DMA?

(k) How do we improve trial infrastructure from the present structure with compartmentalised control and ownership of labs by DPSUs /QA Agencies?

(l) What are the challenges for the industry to use trial and testing facilities including availability of affiliated equipment /ammunition/explosives and sample sub- assemblies from user /DPSUs? Is there a need to restructure the ownership and management of such trial infrastructure and standardise it for level playing field?

(m) What all places does the industry recommend integrated trial nodes encompassing all aspects including firing, mobility, environmental control, and availability of requisite support system as per trial directive made available at one place?

(n) Is DTIS model suitable or does the industry recommend a different approach to development of trial infrastructure?

8. **Issue No 8 - Challenges regarding Srijan Portal**.

(a) There are large number of items on the Srijan portal required by the services for sustenance needs listed out on the MoD website, however the industry response has been lukewarm?

(b) How can the Srijan portal be made more user friendly?

9. **Issue No 9 Draft DPEPP 2020 & Defence Exports**

(a) What measures should be taken to boost defence exports ?

(b) What policy measures are recommended for DPEPP ?

10. **Issue No 10 - Enhancing Understanding and Interaction between Stakeholders**

(a) How to bring synergy between various stakeholders involved in defence R&D and Defence manufacturing ?

(b) Is there a need to have any structural organisation in place to enhance this understanding between various stakeholders?