

**ATMANIRBHAR BHARAT INITIATIVE: BOOSTING DEFENCE**

**MANUFACTURING IN INDIA**

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

under the Guidance and Supervision of

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Submitted by

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**50<sup>TH</sup> ADVANCED PROFESSIONAL PROGRAMME IN PUBLIC**

**ADMINISTRATION (2024-25)**

**INDIAN INSTITUTE OF PUBLIC ADMINISTRATION**

**NEW DELHI**

**CERTIFICATE**

It is hereby declared that this dissertation is my original piece of work and to the best of my knowledge and belief, it contains no material previously published or written by any other person. I am aware of the University's norms and regulations regarding plagiarism including the disciplinary action that it may invite. Any use of the works by any other author, in any form, is adequately acknowledged at their point of use or in the Bibliography.

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I have the pleasure to certify that Brigadier K Sunil Narayanan, has pursued his research work and prepared the present dissertation titled 'Atmanirbhar Bharat Initiative: Boosting Defence Manufacturing in India', under my guidance and supervision. The same is the result of research done by him and to the best of my knowledge; no part of the same has been part of any monograph, dissertation or book earlier. This is being submitted to the Panjab University, Chandigarh, for the purpose of Master of Arts in Public Administration and Public Policy in partial fulfilment of the requirement for the Advanced Professional Programme in Public Administration (APPPA) of Indian Institute of Public Administration (IIPA), New Delhi.

I recommend that the dissertation of Brigadier K Sunil Narayanan is worthy of consideration for the award of Master of Arts degree of the Panjab University, Chandigarh.

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## **ACKNOWLEDGEMENT**

I wish to express my heartfelt gratitude to Prof. K.K. Pandey, my guide, for his invaluable guidance and encouragement throughout the preparation of my dissertation. His advice to approach the research objectively and analyse evidence-based data has been instrumental in keeping me focused on the research objectives. Moreover, his boundless energy and enthusiasm have greatly enhanced the quality of the research presented.

I am grateful to the Director General Shri Surendra Nath Tripathi, IAS (Retd.) for his steadfast guidance and leadership in ensuring we transform into effective 'Karmayogis' by the end of this programme. I thank the Program Director, Prof Neetu Jain and Programme Co-Director, Dr. Saket Bihari, for their unwavering support throughout the course. Additionally, I wish to express my gratitude to the Indian Institute of Public Administration (IIPA) for providing me with the opportunity to select a topic that holds great significance to me and is in a field I have always found fulfilling.

I also wish to acknowledge the contribution of Shri HC Yadav, Librarian, and the staff of the IIPA Library for their valuable assistance in promptly making reference materials available to me.

During the course of my research, I had the privilege of contacting numerous subject matter experts who generously shared their experiences and insights, greatly aiding my research. I am highly indebted to all of them.

I want to express my gratitude to the three pillars of the APPPA office, Shri. Anil Sharma, Shri. Manish Rawat and Shri. Rajesh, for their consistent help and support.

Finally, I must express my deepest gratitude to my family for their continuous support and guidance.

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**ABBREVIATIONS**

<b><u>Abbreviation</u></b>	<b><u>Full Form</u></b>
AI	Artificial Intelligence
ARPANET	Advanced Research Projects Agency Network
AVIC	Aviation Industry Corporation of China
BDL	Bharat Dynamics Ltd
BEL	Bharat Electronics Ltd
BEML	Bharat Earth Movers Ltd
BMD	Ballistic Missile Defence
CAGR	Compound Annual Growth Rate
CASC	China Aerospace Science and Technology Corporation
CETC	China Electronics Technology Group
CLAWS	Centre for Land Warfare Studies
CSSC	China State Shipbuilding Corporation
DAP	Defence Acquisition Procedure
DAPA	Defence Acquisition Program Administration
DCAP	Defence Capability Development Plan
DcPP	Development Cum Production Partner
DIB	Defence Industrial Base
DOD	Department of Defence
DPEPP	Defence Production and Export Promotion Policy
DPM	Defence Procurement Manual
DPSUs	Defence Public Sector Undertakings

DRDO	Defence Research and Development Organisation
DSO	Defence Science Organisation
DTIS	Defence Testing Infrastructure Scheme
EAC	Economic Advisory Council
EGoS	Empowered Group of Secretaries
FDI	Foreign Direct Investment
FMS	Foreign Military Sales
FTP	Fast-Track Procurement
GDP	Gross Domestic Product
GFR	General Financial Rules
GPS	Global Positioning System
GRSE	Garden Reach Shipbuilders & Engineers Ltd
GSL	Goa Shipyard Ltd
HAL	Hindustan Aeronautics Limited
HSL	Hindustan Shipyard Ltd
IC	Indigenous Content
ICDP	Long-Term Integrated Capability Development Plan
IDDM	Indigenously Designed, Developed and Manufactured
iDEX	Innovations for Defence Excellence
IGA	Inter-Governmental Agreements
IL	Industrial Licenses
IoT	Internet of Things
JV	Joint Ventures
LTIPP	Long Term Integrated Perspective Plan

MCF	Military-Civil Fusion
MDL	Mazagon Dock Ltd
MIDHANI	Mishra Dhatu Nigam Ltd
MSME	Micro, Small and Medium Enterprise
NORINCO	China North Industries Group Corporation
OEM	Original Equipment Manufacturer
OF	Ordnance Factorie
OFB	Ordnance Factory Board
PDC	Project Development Cells
PLI	Production-Linked Incentive
PMU	Project Management Unit
PPP	Public-Private Partnership
R&D	Research and Development
SIPRI	Stockholm International Peace Research Institute
SMSC	Strategic Manufacturing Skills Council
SOEs	State Owned Enterprises
SPM	Strategic Partnership Model
TAC	Technical Assessment Cell
TDE	Technical Development Establishments
TDF	Technology Development Fund
UAE	United Arab Emirates
USA	United States of America
ARPANET	Advanced Research Projects Agency Network

**ABSTRACT**

India's defence sector has historically been reliant on foreign imports, making it vulnerable to supply chain disruptions and strategic dependencies. The Atmanirbhar Bharat initiative, launched in 2020, seeks to transform India's defence manufacturing capabilities by promoting self-reliance, fostering indigenous research and development (R&D), and encouraging private sector participation. This dissertation critically examines the progress, challenges, and future prospects of India's self-reliance journey in defence manufacturing.

The research adopts a mixed-method approach, incorporating qualitative analysis of government policies, industry reports, and expert opinions, along with quantitative data from surveys conducted with defence stakeholders. Key policy initiatives such as the Defence Acquisition Procedure (DAP) 2020, the Defence Production and Export Promotion Policy (DPEPP) 2020, the Strategic Partnership Model (SPM), and the establishment of Defence Industrial Corridors (DICs) are evaluated for their impact on reducing import dependence and enhancing domestic production.

Findings indicate that while the initiative has driven significant reforms, including increased defence exports and improved private sector involvement, critical challenges persist. These include delays in technology transfers, bureaucratic inefficiencies, quality control concerns, and the slow pace of procurement reforms. Comparative analysis with global defence models from China, Israel, South Korea,

US and France reveals best practices that India can adopt to accelerate its self-reliance goals.

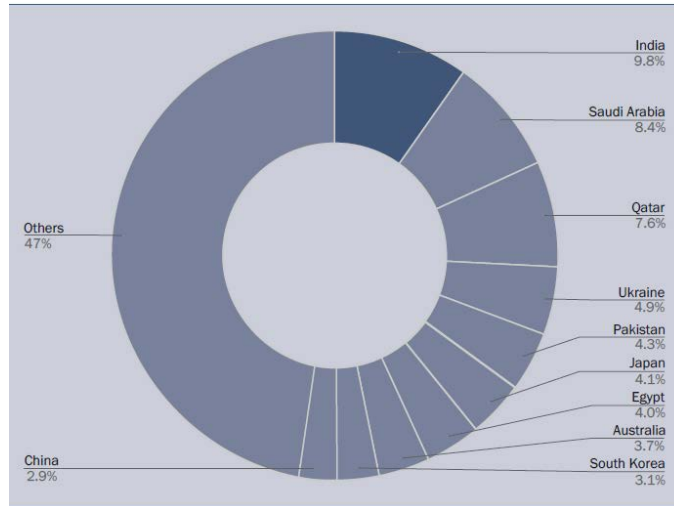
The dissertation concludes that achieving full self-reliance in defence requires a multi-pronged approach, including policy streamlining, enhanced public-private collaboration, skill development, and sustained investment in R&D. It provides strategic recommendations to strengthen India's defence manufacturing ecosystem and outlines future research directions to assess long-term policy effectiveness. Ultimately, a well-integrated and innovation-driven defence industry will be crucial for India's national security, economic growth, and geopolitical standing in the coming decades.

## **CHAPTER 1**

### **INTRODUCTION**

#### **1.1. Background:**

Ever since independence, India has been reliant on imports to meet its defence requirements. According to Stockholm International Peace Research Institute (SIPRI) data from 1993 to 2023 India has been the largest importer of defence equipment in the world and accounted for 9.8% of global arms imports from 2019 to 2023 (SIPRI, n.d.). This reliance has posed strategic, financial and operational risks for the country, making it vulnerable to external pressures and supply chain disruptions during times of geopolitical tensions. India, despite having a well-established defence public sector, including the Defence Research and Development Organisation (DRDO) and Defence Public Sector Undertakings (DPSUs), has struggled to develop a fully self-sufficient defence industry (Behera, 2016) capable of meeting the demands of its armed forces. It is a well-known fact that during Operation Vijay (Kargil Operations) the United States of America denied India the services of Global Positioning System (GPS). Currently the delivery of Tejas fighter aircraft by Hindustan Aeronautics Limited (HAL) to the Indian Air Force has been delayed by over a year, and its delivery remains in jeopardy since the United States of America has been continuously delaying the delivery of contracted General Electric F404-IN20 engines for the aircraft.



**Figure 1.1: 10 Largest Importers in the World (2019-23)**

(Source: SIPRI Arms Transfers Database Mar 2024)

India shares its borders with two militarily potent adversaries with whom it had many armed conflicts in the past and are at a constant state of stand-off. In such a scenario, dependence on foreign countries for critical defence technology and equipment is fraught with dangers, especially since India believes in strategic autonomy on foreign policy decisions which is not appreciated by America. Dependence on imports also makes India vulnerable to supply chain disruptions and geopolitical pressures at crucial junctures jeopardising national sovereignty.

With the aim of addressing the above issues, Prime Minister of India, Mr Narendra Modi, gave a Clarion Call for Atmanirbhar (self-reliant) Bharat on 20 May 2020, (Press Information Bureau, 2020), which is directed at promoting indigenous manufacturing, especially the defence industry, thereby, promoting self-reliance and reducing dependence on imports (Patel et al., 2023). Atmanirbhar Bharat represents a paradigm shift from India's traditional defence procurement strategy towards an approach that prioritizes domestic production, indigenous technological development

and greater participation from private players and startups. Under this framework, several policy reforms have been introduced to transform India's defence manufacturing ecosystem. Some of the important ones include;

1.1.1. Promulgation of the Defence Acquisition Procedure (DAP) 2020, which streamlines procurement processes and prioritizes domestic sourcing (MoD, 2020).

1.1.2. Publication of the Defence Production and Export Promotion Policy (DPEPP) 2020, setting a target of ₹1.75 lakh crore turnover in defence production and ₹35,000 crore in defence exports by 2025 (PIB, 2023).

1.1.3. Notification of five Positive Indigenisation Lists, restricting imports of over 400 defence items to stimulate local manufacturing (IBEF, 2023).

1.1.4. Selecting of Strategic Partnership Model (SPM), facilitating collaboration between Indian private firms and global defence manufacturers (Behera, 2024).

1.1.5. Provision of Production-Linked Incentive (PLI) Scheme, which has attracted ₹25,000 crore in private investment (IBEF, 2024).

1.1.6. Creation of two Defence Industrial Corridors (DICs) (Rastogi, 2023).

India's journey towards self-reliance in defence has been marked by significant milestones, such as the development of Tejas Light Combat Aircraft (LCA), INS Vikrant (India's first indigenously built aircraft carrier), Pinaka Multi-Barrel Rocket System and multiple indigenous missile systems (Patel et al., 2023). However, challenges remain in terms of;

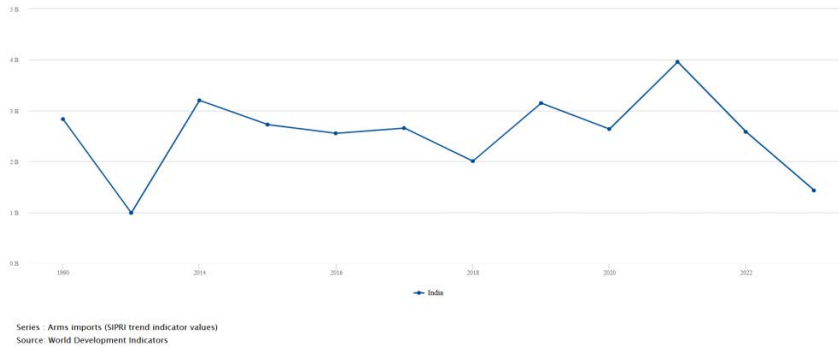
- Reducing dependency on foreign technology,
- Scaling up domestic production,
- Bridging technological gaps,
- Improving indigenous research and development (R&D), and
- Ensuring the competitiveness of Indian defence firms in the global market.

## **1.2. Statement of the Problem:**

Despite the Government of India's push toward indigenization through various initiatives over the last decade, starting with "Make in India" initiative since 2014 and "Atmanirbhar Bharat" since 2020, India's defence sector continues to be heavily dependent on imports for critical defence equipment, including advanced technologies like missile systems and fighter jets - (Figure 1.2 indicate Indian imports and Figure 1.3 below indicate the imports in comparison to other countries since 1990 to 2024). According to Patel et al. (2023), and recent data, India remains one of the largest arms importers, second next to Ukraine, and globally accounting for 11% of global arms sales.

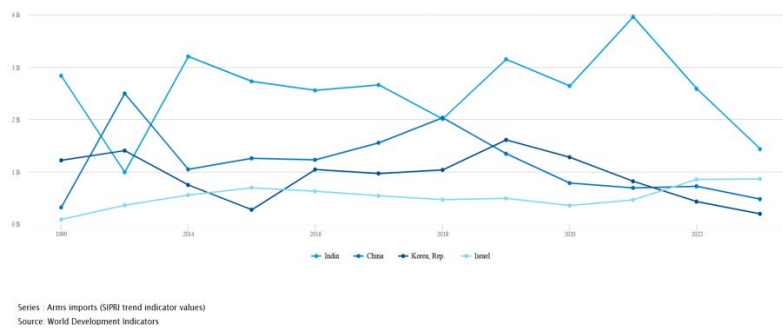
Yet, recently the government has amended many of the archaic policies and issued fresh policy frameworks like the Defence Acquisition Procedure (DAP) 2020 and the Defence Production and Export Promotion Policy (DPEPP) 2020, etc, also the government has taken many other initiatives which prioritize domestic procurement and focus on increasing defence exports. These initiatives have given a fillip to exports. The Figure 1.4 highlights the exports since 1990 and the Figure 1.5 shows Indian exports in comparison to other countries, which clearly indicates that, there are significant challenges which inhibit growth of Indian defence industries and India is far behind its competitors. These include technological gaps, supply chain vulnerabilities and a reliance on foreign Original Equipment Manufacturers (OEMs) (IBEF, 2023; Pandey, 2019). While these initiatives have generated momentum for domestic defence manufacturing, the sector still faces delays in production, particularly with indigenously developed platforms such as the Tejas fighter jet, where critical foreign components like the engine etc, have caused production bottlenecks (PIB, 2020).

Therefore, further research is required to evaluate the effectiveness of the Atmanirbhar Bharat initiative, identify persistent challenges, and recommend strategies to achieve self-reliance in defence manufacturing. The effectiveness of public-private partnerships, SME involvement and technology transfer under current policies needs to be assessed systematically to make the initiative successful in the long run.



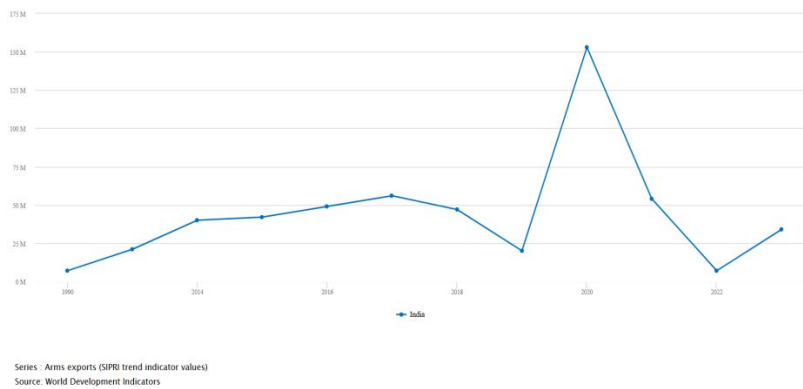
**Figure 1.2: India's Arms Imports (1990-2024)**

(Source: World Development Indicators Feb 2025)



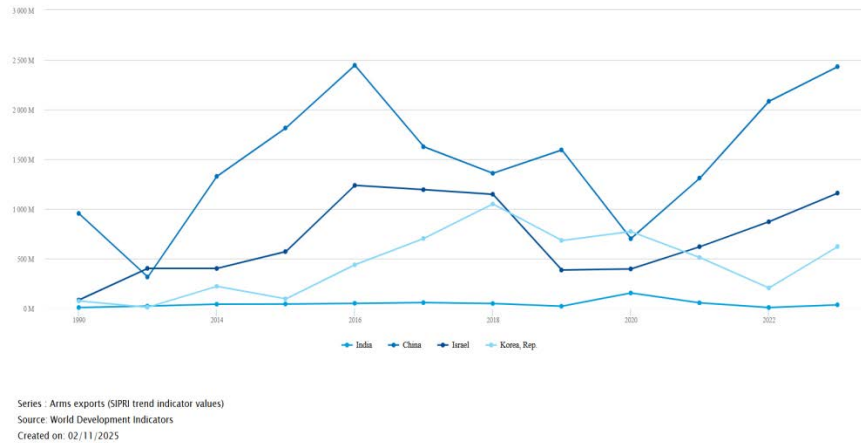
**Figure 1.3: India's Imports Compared to China, S Korea and Israel (1990-2024)**

(Source: World Development Indicators Feb 2025)



**Figure 1.4: India's Arms Exports (1990-2024)**

(Source: World Development Indicators Feb 2025)



**Figure 1.5: India's Exports Compared to China, S Korea and Israel (1990-2024)**

(Source: World Development Indicators Feb 2025)

Further, a critical gap exists in evaluating whether Atmanirbhar Bharat has truly reduced India's dependency on imports, and if so, to what extent and in which sectors. Additionally, it is essential to assess whether India's policy measures align with global best practices in defence self-reliance such as those followed by China, Israel, South Korea, USA and France.

### 1.3. Research Objectives:

1.3.1. Assess the progress of Atmanirbhar Bharat initiative on strengthening India's defence manufacturing sector.

1.3.2. Analyse the effectiveness of the various policy initiatives of the government, such as DAP 2020, DPEPP 2020, DICs, SPM, PLI and Positive Indigenisation Lists, etc.

1.3.3. Examine the role of public and private enterprises, including DRDO, DPSUs, MSMEs and private defence firms, etc., towards self-reliance efforts.

1.3.4. Identify the key challenges and opportunities in achieving self-reliance in defence.

1.3.5. Compare India's self-reliance approach with global models such as China's Military-Civil Fusion, Israel's private sector-driven R&D and South Korea's export-driven strategy.

1.3.6. Recommend strategies towards enhancing self-reliance in defence manufacturing.

**1.4. Research Methodology:** Mixed-method strategy with descriptive design, combining both qualitative and quantitative research methods has been used to get a comprehensive understanding of the effectiveness of the Atmanirbhar Bharat initiative in promoting indigenous manufacturing in defence and thus achieving self-reliance. Research methods to be applied are as under;

**1.4.1. Qualitative Methods:**

**1.4.1.1. Interviews:** Conducted semi-structured interviews with defence industry leaders, policymakers and experts in the subject. Due to constraints of availability, time, security and anonymity, interviews

too can be conducted in the form of a subjective questionnaire, wherein the respondent can give out his ideas freely.

**1.4.1.2. Content Analysis:** Analysed government policy documents, defence industry reports and media coverage to understand the narrative and policies around Atmanirbhar Bharat in defence manufacturing.

#### **1.4.2. Quantitative Methods:**

**1.4.2.1. Surveys:** Covered questionnaire to stakeholders in the defence environment to collect data on perceptions, challenges and the impact of the Atmanirbhar Bharat initiative.

**1.4.2.2. Comparative Analysis:** Compared quantitative metrics of defence manufacturing strategies and policies in other countries who have in the recent past developed commendable capacities towards self-reliance in defence manufacturing, for example, China, Isreal and South Korea.

#### **1.4.3. Data Sources:**

**1.4.3.1. Primary Data Sources:** Include interviews with defence manufacturers, industry experts, senior officials dealing with defence procurement and policy making officials. Questionnaires

distributed to defence personnel, defence sector employees, industry stakeholders, etc.

**1.4.3.2. Secondary Data Sources:** Included government Reports; such as the ones published by the Ministry of Defence, Ministry of Finance, etc. Industry Reports: Reports from defence industry associations, market research firms, think tanks focusing on defence and institutions like SIPRI and RAND, Research papers and articles on defence manufacturing, policy and self-reliance.

## **1.5. Justification:**

The Atmanirbhar Bharat initiative was launched more than four years ago, on 20 May 2020 and since then, the Prime Minister of India Mr Narendra Modi and the Indian Government have been vehemently emphasising on the need for self-reliance in manufacturing, especially in defence manufacturing. While policies such as the Strategic Partnership Model and FDI liberalization (up to 74%) have been introduced, their effectiveness in fostering self-reliance remains a subject of debate (Rathi et al., 2019). This research tends to evaluate of these initiatives and recommend policy improvements that will help India achieve its long-term goal of defence self-sufficiency. It is therefore, the right time to carry out an assessment of the achievements of the initiative towards indigenous manufacturing in defence sector. Defence manufacturing sector is crucial to national security, and achieving self-reliance in the sector is necessary for the following reasons;

**1.5.1. India's Neighbourhood:** India shares its borders with two nuclear armed countries who are major military powers of the region. Even today there is constant tensions with them due to the Pakistani support to terrorist activities in India and the stand-off at Ladakh with the Chinese (Sahoo, 2023).

**1.5.2. Supply Chain Disruptions:** India's closest allies and major arms suppliers, Russia and Israel are involved in long drawn wars of their own affecting India's procurement pipeline highlight the need for indigenous production (RAND, 2023). USA has been dragging its feet on supply of critical equipment like the engines for Tejas.

**1.5.3. Strategic Autonomy:** A nation's ability to produce its own defence equipment is critical for national security and strategic autonomy (Rossiter & Cannon, 2019). Self-reliance in defence manufacturing will enable India to make defence-related decisions independently without being influenced by foreign powers (PIB, 2020).

**1.5.4. Reducing Dependence on Imports:** Dependency on foreign equipment compromises national security during geopolitical tensions, as was illustrated by the US actions of denying use of GPS during the Kargil conflict (IBEF, 2024).

**1.5.5. Strengthening Domestic Industrial Base:** By promoting indigenous production, India can create a robust defence manufacturing ecosystem that supports broader industrial growth (Karanth. S & Bhat. V, 2024).

**1.5.6. Technological Advancement:** Focusing on indigenous manufacturing will enhance India's technological capabilities, which are crucial for innovation in defence technologies (Sinha & Gupta, 2022). Developing indigenous technologies through research collaborations between DRDO, academia and private firms can drive innovation in sectors beyond defence, such as space exploration and cybersecurity (Ahmed, 2024). India has already made strides in missile development (BrahMos), space technology (ISRO) and AI-driven defence applications, but significant investment in research and development (R&D) is still required.

**1.5.7. Boost to Small and Medium Enterprises (SMEs):** SMEs in India will benefit from becoming part of the larger defence supply chain, contributing components, systems, and services, which will enhance the overall industrial ecosystem (Natarajan. K, 2023).

**1.5.8. Export Potential:** A strong defence manufacturing base will not only meet domestic needs but also position India as a global exporter in the defence sector (Patel et al., 2023). Further, India's vision to increase defence exports to ₹5 billion by 2025 underlines the economic potential of Atmanirbhar Bharat (PIB, 2023)

**1.5.9. Geopolitical Influence:** A self-reliant defence sector allows India to play a more significant role in regional and global security affairs, thus enhancing its geopolitical influence, especially as the leader of the Global South.

**1.5.10. Job Creation:** The Indian defence manufacturing sector has the potential to significantly contribute to GDP growth (MoD, 2023). The government aims to achieve a ₹1.75 lakh crore (\$22 billion) defence production turnover by 2025. The development of a defence manufacturing sector will generate employment opportunities, particularly in the skilled sectors of engineering, manufacturing, and technology (Ministry of Finance, 2020).

## **1.6. Research Questions:**

1.6.1. What has been the contribution of the Atmanirbhar Bharat initiative towards development of India's defence manufacturing capabilities and reducing its reliance on foreign imports?

1.6.2. How effective are the government policies, including the enabling policies, been in promoting a self-reliant defence sector?

1.6.3. What are the key opportunities and challenges provided by the initiative towards manufacturing in the defence sector?

1.6.4. How does India's defence self-reliance compare with other countries such as the China, Israel and South Korea?

1.6.5. What strategies should be adopted to strengthen India's defence manufacturing ecosystem in the long term?

## **1.7. Limitations:**

1.7.1. This study focuses specifically on defence manufacturing within the overall framework of the Atmanirbhar Bharat initiative, leaving out other sectors such as agriculture and energy, which are also part of the broader self-reliance initiative.

1.7.2. The research will primarily covers government policies, manufacturing trends and stakeholder perspectives within India's defence sector. However, obtaining proprietary or sensitive data related to defence contracts and procurement processes may pose challenges due to confidentiality and security concerns.

1.7.3. Time constraints, availability and willingness of high-profile stakeholders like the, policymakers, defence officials, industry leaders etc to participate in interviews limit firsthand insights. Also, Given the evolving nature of policies and global defence dynamics, findings may need periodic updates.

1.7.4. Comparative analysis pre and post the initiative may not be easy due to the secretive nature (due to security constraints) of defence contracts and deals. Also, differences in geopolitical contexts and military doctrines make direct comparisons with countries like the China, Isreal and South Korea challenging.

**1.8. Chapter Scheme:** The research is proposed to be laid out as per following chapters;

**1.8.1. Chapter 1: Introduction.** This chapter aims to introduce the topic to the reader. Aspects intended to be covered in this chapter include Background, Research Problem and Objectives, Justification for the research, Research Questions, Research Methodology, Limitations of the Research and Dissertation structure.

**1.8.2. Chapter 2: Review of Literature.** This chapter carries out detailed Review of Literature and will include the Historical context of India's defence manufacturing, Key Policies and initiatives preceding Atmanirbhar Bharat initiative and those implemented as part of it, Comparative Analysis of self-reliance efforts in various countries and identify the Challenges facing the self-reliance agenda.

**1.8.3. Chapter 3: Defence Industrial Base in India.** This chapter analyses India's defence ecosystem, including Evolution and the Role of Public Sector Units, like Ordnance Factories, Defence Public Sector Undertakings, Defence Research and Development Organisation etc. It also talks about the Role of Private Industry in India's Defence Manufacturing and discusses the Challenges in Achieving Self-reliance in Defence.

**1.8.4. Chapter 4: Policy Framework & Government Initiatives for Atmanirbhar Bharat.** This chapter discusses the various Important Policies

in India concerning defence sector including the Defence Acquisition Procedure, Defence Production & Export Promotion Policy, Foreign Direct Investment policy, Defence Industrial Corridors, etc. The chapter also discusses the various initiatives undertaken by the government under Atmanirbhar Bharat initiatives and others to promote defence production and the chapter also evaluates the policies of various countries in comparison to India. Finally, the chapter analyses the Challenges in Policy Implementation in India.

**1.8.5. Chapter 5: Indian and Global Defence Models.** This chapter studies the defence models of China, Isreal, South Korea, USA and France to understand the diverse approaches to defence self-reliance and industrial growth employed by these countries, and to derive key takeaways for India to achieve success in its desire to achieving self-reliance and also becoming a major defence exporter.

**1.8.6. Chapter 6: Public and Expert Opinions on Atmanirbhar Bharat.** This chapter analyses the government policies and initiatives undertaken under the Atmanirbhar Bharat initiative and compares it the perceptions of the public working in the field in the form of a survey obtained through a questionnaire using the Google form. The chapter further seeks opinion of the experts in the subject through the means of semi-structured questions administered in the form of Google form. The chapter seeks the inputs and recommendations from the public survey and the expert opinion on all policy matters and government initiatives under the Atmanirbhar Bharat initiative.

**1.8.7. Chapter 7: Recommendations and the Way ahead.** This chapter highlights all the findings from the previous chapters as also the recommendations given by the experts to provide actionable policy recommendations to strengthen India's defence manufacturing ecosystem, R&D and export potential, which would help India in achieving self-reliance in defence manufacturing and also make it a major defence exporter.

## **CHAPTER 2**

### **LITERATURE REVIEW**

This chapter examines the historical evolution of India's defence self-reliance, policy interventions and comparative global models. The focus is on evaluating India's progress under Atmanirbhar Bharat, assessing key reforms such as Defence Acquisition Procedure (DAP) 2020, Defence Production and Export Promotion Policy (DPEPP) 2020, etc., and comparing India's self-reliance strategy with leading global defence models like China, Israel and South Korea.

Atmanirbhar Bharat being a relatively new initiative, the availability of research work on the subject is rather scarce, and most of the data are published by the Government only. To get a comprehensive overview and understanding of the existing research and literature relevant to the topic a detailed literature review has been undertaken so as to gain a theoretical and conceptual framework for the research by highlighting key concepts, theories and methodologies that have been used by other researchers in the field. The major source of information is the govt websites, which provide data on existing policy provisions and details on initiatives in defence manufacturing. More than 120 articles, research works, policy documents etc have been analysed for this research work, however, only some of the more relevant ones are being reviewed in the literature.

Public perception and expert opinions from primary research have been integrated to assess policy effectiveness and identify existing challenges where

relevant. For better comprehension, the literature review has been divided into various subheads.

## **2.1. Historical Evolution & Defence Dependence:**

**2.1.1.** The Stockholm International Peace Research Institute (SIPRI) reports titled; “**Trends in International Arms Transfers (2023)**”, “**Global Arms Transfers 2023**”, “**India's Arms Imports: Trends and Analysis (2018-2022)**” and “**India’s Arms Trade and Global Defence Market Trends (2024)**”, highlight that India has historically relied on foreign suppliers for critical defence technologies, including fighter jet engines, electronic warfare systems and missile guidance systems. According to these reports, India accounted for 9.8% of global arms imports between 2019 and 2023 and 11% of total global arms imports (2018-22), making it the world’s largest arms importer. Russia’s share of Indian arms imports has declined from 64% (2013-17) to 45% (2018-22) and further down to (36%). Other major suppliers include France (33%) and USA (13%). France has emerged as a key supplier, largely due to Rafale fighter jets and Scorpene class submarines. The reports acknowledge India’s push for indigenous production under Atmanirbhar Bharat and that there is gradual reduction in import dependency. HAL’s Tejas Fighter Jet and DRDO’s missile programs are highlighted as progressive indigenization efforts. iDEX initiative and Strategic Partnership Model are seen as promising but still evolving. However, India is still not among the world’s top 10 arms exporters, while the country has set a target of \$5 billion in annual defence exports by 2025. The major challenges to self-

reliance efforts are limited private sector participation in defence Research and Development (R&D), high dependence on foreign Original Equipment Manufacturer (OEMs) for critical technologies and lengthy procurement cycles and bureaucratic delays.

**2.1.2. World Bank Military Expenditure Database (2024) and World Bank World Development Indicators (India Dataset) (2024)**, provide comprehensive information on global military expenditures, including India's defence spending trends. The data offers insights into India's defence budget allocations, military R&D investments and military exports/imports over time. India consistently ranks among the top five countries in military spending, reflecting its geopolitical threats and modernization efforts, and India's military expenditure has remained between 2.4% and 2.9% as a percentage of Gross Domestic Product (GDP). The documents highlight that India's GDP growth rate of 6.8% in 2023 has provided a foundation for increasing defence industrial expansion. Further, the manufacturing sector growth is a crucial factor for India's ability to support self-reliant defence production. However, China's military spending has outpaced India's significantly, maintaining an exponential growth trend and its rapid industrialization has allowed it to scale up domestic defence production faster than India. Further, while the investment in R&D has increased in India, however, it has not reached the levels of South Korea and Israel, who have also leveraged high-tech industrial sectors to drive defence innovation, whereas India is still dependent on foreign OEMs.

2.1.3. The document titled “**Making India Self-Reliant**” by Dr. Shamika Ravi, part of the Economic Advisory Council (EAC) to the Prime Minister Working Paper Series, delves into India's pursuit of self-reliance across three critical sectors, viz, food, energy and defence. The document emphasizes the importance of reducing reliance on foreign defence imports through initiatives like Atmanirbhar Bharat. The paper further stresses the need for strategic investments in technology, infrastructure, and human capital to bolster India’s self-reliant growth.

2.1.4. The article titled, "**Atmanirbharta in Defence: How has been the Journey So Far? Where are we Headed?**" by Lt. Gen. VK Saxena (2022) evaluates India's progress toward defence self-reliance under the Atmanirbhar Bharat initiative. This issue brief published by Centre for Land Warfare Studies (CLAWS) evaluates the progress of Atmanirbhar Bharat and Make in India initiatives in the defence sector. It provides a historical overview, key achievements and roadblocks that still hinder full self-reliance. It highlights how various reforms, including the Defence Acquisition Procedure (DAP) and increased private sector involvement have contributed to indigenization. The author advocates that, while significant progress has been made in defence manufacturing, India still has a long way to go in achieving complete self-reliance, particularly in high-end technology.

2.1.5. Laxman Kumar Behera (2024) in his article, "**India’s Defence Industry: Achievements and Challenges**" evaluates the progress of India's defence industry under the Atmanirbhar Bharat initiative. He highlights that,

while there has been significant improvement in defence production and exports, challenges such as scaling up production to meet the procurement needs of the armed forces remain. The paper calls for reforms in R&D, faster decision-making in procurement, and enhanced collaboration between the public and the private sectors.

2.1.6. This 2014 report titled “**Indian Defence Procurement Process and Policy**” by the Feedback Business Consulting. (2014), Virginia Economic Development Partnership, analyses India’s defence procurement system before the implementation of DAP 2020. It highlights foreign dependency (70% of defence imports), bureaucratic delays and inefficient procurement policies that previously hindered self-reliance. The document also outlines early FDI reforms and the role of offset policies in securing foreign collaborations. Some key facts covered in the report are; India’s defence budget in 2013 was \$41 billion (10% increase from 2010) and 70% of defence equipment were procured from foreign sources before 2014, the FDI limit in defence in 2014 was 26% and India’s defence spending was projected to grow at 18% Compound Annual Growth Rate (CAGR) from 2014 to 2025.

2.1.7. The book titled “**Indian Defence Industry: An Agenda for Self-Reliance**” by Laxman Kumar Behera (2016), provides an in-depth analysis of India's defence industry and its journey towards self-reliance. It covers the evolution of defence industrialization, challenges faced by public sector enterprises and the role of the private sector in modernizing India's defence manufacturing capabilities. The book also outlines recommendations for

strengthening defence R&D and procurement policies. It gives out the chronology of development in the indigenous production, starting from 1950-1980s when India was mostly reliant on Russian and Western military technology. Later in 1990s-2010s there was a shift towards indigenization with mixed results. 2010 onwards greater focus on was given to public-private collaboration for def production. The book further gives out that India has 41 ordnance factories and 9 defence public sector undertakings (DPSUs) and the self-reliance in defence production in 2016 was around 35-40%. Further, the Defence Research and Development Organisation (DRDO) employs over 50,000 personnel but faces inefficiencies in R&D.

2.1.8. The article written by Harsh V. Pant & Kartik Bommakanti on “**India’s National Security: Challenges and Dilemmas**” (2019). analyses India's security challenges in the Indo-Pacific region, focusing on military modernization, border disputes with China and Pakistan and nuclear deterrence strategies. It discusses the strategic implications of Atmanirbhar Bharat on national security and military self-reliance. This document provides an analysis of India’s evolving national security strategy in light of geopolitical tensions, defence modernization and economic constraints. It discusses India’s preparedness for a two-front war with China and Pakistan and evaluates its defence industrial capabilities. The key themes covered in the article are, geopolitical challenges, requirement of military modernization, defence budgeting issues and strategic partnerships with countries like the US, Israel, and France.

## 2.2. Policy Reforms:

2.2.1. The principal policy document is the “**Defence Acquisition Procedure (DAP) 2020**”, which is a comprehensive policy framework aimed at streamlining the acquisition process, enhancing indigenous defence production and reducing reliance on imports. It builds upon the Defence Procurement Procedure (DPP) 2016, incorporating structural, procedural and regulatory modifications to ensure greater transparency, efficiency and self-reliance in India's defence sector. This document is a key enabler of the Atmanirbhar Bharat initiative, emphasizing domestic defence production, technology development, and private-sector participation. The key policy guidelines in the document include;

### **2.2.1.1. Indigenous Content (IC) and Self-Reliance:**

Minimum indigenous content requirement has been increased from 40% to 50% in various procurement categories and preference has been given to Indian vendors under the Buy (Indian– Indigenously Designed, Developed and Manufactured (IDDM)) and Buy (Indian) categories. There are incentives for domestic development of aero engines, silicon wafer fabs and military-grade software.

### **2.2.1.2. New Procurement Categories:**

The new categories are; firstly, ‘Buy Global – Manufacture in India’, which allows foreign Original Equipment Manufacturers (OEMs) to manufacture in India through technology transfer. Next category is Make-I (Government

Funded) where the government supports up to 70% of prototype development costs. The third category is Make-II (Industry Funded), which is open to MSMEs and startups without government funding. Finally, Make-III, is primarily import substitution strategy for sustaining existing weapon systems.

**2.2.2.3. Leasing:** Option for leasing has been introduced for big-ticket defence equipment, which aims to reduce upfront capital expenditure while maintaining operational readiness.

**2.2.2.4. Offset Policy Revisions:** New policy emphasizes investment, technology transfer and exports. Further, offsets have been removed from Inter-Governmental Agreements (IGA) and Foreign Military Sales (FMS) to reduce over-dependence on offsets.

**2.2.2.5. Fast-Track Procurement (FTP):** DAP introduces single-stage approvals for capital acquisition up to ₹5 billion to speed up urgent defence procurements.

**2.2.2.6. Project Management Unit (PMU):** A dedicated PMU established to monitor acquisition projects and ensure time-bound procurement.

**2.2.2.7. Boost to MSMEs and Startups:** Contracts have been reserved for MSMEs (projects below ₹100 crore/year) and special

incentives under Innovations for Defence Excellence (iDEX), Technology Development Fund (TDF), and Open Competition for fostering defence innovation.

**2.2.2.8. Foreign Direct Investment (FDI) Reforms:** FDI cap increased to 74% (automatic route) and up to 100% (government approval route) for niche technology areas.

**2.2.2.9. Long-Term Integrated Capability Development Plan (ICDP):** Replaces the earlier 15-year Long Term Integrated Perspective Plan (LTIPP) with a 10-year ICDP, aligning it with the five-year Defence Capability Development Plan (DCAP).

**2.2.2.10. Streamlined Trial and Testing Procedures:** Emphasis on objective, technology-driven assessments. Trials are conducted in shorter timelines to minimize acquisition delays.

2.2.2. The next important policy document is the "**Defence Production and Export Promotion Policy (DPEPP) 2020**", which outlines roadmap for transforming India into a global defence manufacturing hub. The policy is structured to enhance self-reliance in defence production while boosting exports. It builds on India's Atmanirbhar Bharat vision and sets ambitious goals such as achieving a \$25 billion turnover in defence manufacturing by 2025, with \$5 billion in defence exports. The DPEPP is a key initiative for reducing India's dependence on foreign defence suppliers and aims at

indigenization of 5,000 imported components for defence equipment. The document also streamlines procurement processes and improving ease of doing business, thereby encouraging MSME participation in defence production, strengthening quality assurance mechanisms and expanding export markets for Indian defence equipment. It was introduced along with DAP 2020 and some of the policy initiatives in the document include; setting up of Project Management Unit (PMU) to streamline procurement and integration of defence systems; creation of Technical Assessment Cell (TAC) to evaluate technology readiness levels, publication of Negative Import List which restrict import of certain defence items to promote local production, corporatization of Ordnance Factory Board (OFB) and phased disinvestment of Defence Public Sector Units (DPSUs). Expected outcomes of these policy initiatives as per the document are; increase in domestic procurement share from 60% to 75%, doubling procurement value from ₹70,000 Cr to ₹1,40,000 Cr by 2025, boosting defence exports to ₹35,000 Cr, integration of emerging technologies like AI, Internet of Things (IoT) and blockchain in defence production. The facts and figures in the document are; setting a target of ₹1.75 lakh crore (\$25 billion) turnover in the defence sector by 2025, including ₹35,000 crore (\$5 billion) in exports, 8,000+ MSMEs currently support the defence supply chain, 460+ private sector licenses issued for defence production and establishing 6-8 advanced testing facilities under the Defence Testing Infrastructure Scheme (DTIS).

2.2.3. **The Defence Procurement Manual (DPM) 2009**, is another important document which provides comprehensive guidelines on the

procurement of goods and services for the Indian defence sector. It serves as a key regulatory framework to streamline defence acquisitions, enhance transparency, and improve efficiency in procurement processes. The manual establishes principles, policies and procedural guidelines for procurement under the revenue budget and outlines the responsibilities of various stakeholders. The manual lays out the principles of public procurement in defence, emphasizing efficiency, economy, transparency and competition and it mandates adherence to General Financial Rules (GFR) 2005 and other government regulations. However, the last amendment to the document was done in 2015 and is now more than a decade old and precedes the Make in India initiative and Atmanirbhar Abhiyan.

2.2.4. Another document of great importance for the research is the “**Ministry of Defence Years of Reforms Publication (August 2023)**”, available on the official site as the Achievements and gives out a detailed account of the various initiatives and policy interventions by the Government towards achieving the dream of self-reliance in defence manufacturing. Some of the issues covered are;

**2.2.4.1. Agnipath Scheme:** The scheme has multifarious aims but with respect to defence manufacturing it ensures that the revenue budget is reduced as far as pension and other benefits are concerned and more funds are available for procurement, which has a direct bearing on money available for the various defence manufacturing entities.

**2.2.4.2. Positive Indigenisation Lists of Services:** four lists of Services notified, enabling the Indian defence industry to manufacture over 400 items using their own design & development capabilities. Presently there are five lists with 509 items.

**2.2.4.3. Positive Indigenisation Lists of Defence Public Sector Undertakings (DPSUs):** Four lists containing over 4,600 items notified to minimise imports by DPSUs.

**2.2.4.4. Defence R&D** has been opened up for industry, start-ups and academia with 25% of defence R&D budget earmarked for this purpose.

**2.2.4.5. Defence Exports:** 23-fold increase in Defence Exports has been noticed, surging from Rs. 686 Crore in FY 2013-14 to nearly Rs. 16,000 Crore in FY 2022-23 and exports have reached more than 85 countries. A wide range of major platforms including aircraft like Dornier-228, artillery guns, Brahmos Missiles, PINAKA rockets & launchers, radars, simulators, armoured vehicles, etc. are being exported by about 100 domestic companies.

<b>DEFENCE EXPORTS DURING THE LAST FIVE YEARS (RS IN CRORES)</b>						
	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23 (TILL 06.03.2023)
<b>TOTAL EXPORT VALUE</b>	4,682	10,746	9,116	8,435	12,815	16,000 APPROX

**Table 2.1: Defence Exports (2017 to 2023)**

(Source: Ministry of Defence Years of Reforms Publication, 2023)

YEAR	2013-14	2021-22
IMPORT VALUE (CAPITAL + REVENUE)	41,198.61	50,061.67
EXPORT VALUE	1153	12815
RATIO (IMPORT TO EXPORT)	35.73	3.90

(RS. IN CRORE)

**Table 2.2: Defence Import to Export Ratio (2013 to 2022)**

(Source: Ministry of Defence Years of Reforms Publication, 2023)

**2.2.4.6. Defence Industrial Corridors:** Two Defence Industrial Corridors (DIC) have been set up in Uttar Pradesh and Tamil Nadu to catalyse indigenous production of defence and aerospace related items. Both the DICs have been integrated with the Prime Minister's 'Gati Shakti' National Master Plan. A total investment worth Rs 20,000 crore is expected by the year 2024-25. As per experts as of now a total of 245 Memorandum of Understanding (MoU) have been signed at a prospective investment of Rs 49949 Crore, however the actual investment so far is Rs 8331 Crores.

**2.2.4.7. SRIJAN Indigenisation Portal:** A non-transactional online market place for all Defence Public Sector Undertakings (DPSUs) and the Armed Forces (SHQ) has been created by the government to increase transparency and provide a level playing field to the private industries including the MSMEs. More than 32,000 items are available for public view.

**2.2.4.8. Innovations for Defence Excellence (iDEX):** Launched by the Prime Minister in 2018, to provide for co-creation & co-development in defence sector. As an enabling platform for defence start-ups, iDEX envisages to build a defence and aerospace ecosystem in the country. Concluded nine rounds of Defence India Startup Challenges (DISCs), receiving more than 8000 applications from innovators. 14 products developed under iDEX were granted the Acceptance of Necessity (AoN) by Government. More than 250 contracts/MoU's signed so far. Government has approved a budgetary support of Rs 498.78 crore to iDEX, for five years from 2021-22 to 2025-26. Under the iDEX a scheme called “**Acing Development of Innovative Technologies**” (ADITI) scheme and “**Support for Prototype and Research Kickstart in Defence (SPARK)**” too was launched in 2024, which focuses on funding startups, MSMEs and innovators in developing defence technologies. It is designed to accelerate indigenous R&D, prototype development and commercialization of products for the Indian defence sector.

<b>Financial Year</b>	<b>Budget Amount required each year (Rs. in Crore)</b>	<b>Remarks</b>
2023-24	-	Budgeted amount will be sought as per requirement of the respective year.
2024-25	400	
2025-26	350	
<b>Total for 3 years</b>	<b>750</b>	

**Table 2.3: Year wise Proposed Funds for iDEX (2023-2026)**

(Source: PIB Ministry of Defence, 2024)

**2.2.4.9. Technology Development Fund (TDF):** A Rs 100 crore corpus fund created to enable Indian industries, specially MSMEs, for indigenisation of defence products. The fund may also be utilised for developing new technologies as required by DRDO, Services and DPSUs.

**2.2.4.10. DRDO Patents for Indian Industry:** All patents and relevant intellectual publications have been made available on the DRDO website at [www.drdo.gov.in](http://www.drdo.gov.in). These can be used freely by Indian industry. The total number of Intellectual Property Rights (IPR) available with DRDO has increased from 596 in 2014 to 2,516 in 2023.

**2.2.4.11. Development Cum Production Partner (DcPP) Model:** This model has been envisioned for DRDO developed systems. It provides for involvement of the private industries from the beginning of the development cycle. This results in reduction in time-frame of the development-to-induction cycle. Further no Transfer of Technology (ToT) fees are being charged from DcPPs.

2.2.5. A presentation titled “**Aatmanirbhar Bharat: A Reform Initiative**” by the Economic Diplomacy and States Division of the Ministry of External Affairs (2024) gives out initiatives undertaken by the government for increasing the investments in India including the creation of the **Empowered Group of Secretaries (EGoS)** and the **Project Development Cells (PDCs)**. The initiative aims to make India a more investor-friendly destination, further

smoothing investment inflows, and at the same time will also bring synergy amid Ministries and Central/State Governments in investment/incentive policies. The EGoS will have the following leadership; **Cabinet Secretary** (Chairperson), **CEO, Niti Aayog** (Member), **Secretary, Department for Promotion of Industry and Internal Trade** (Member Convenor), **Secretary, Department of Commerce** (Member), **Secretary, Department of Revenue** (Member), **Secretary, Department of Economic Affairs** (Member) and **Secretary of Department concerned** (to be co-opted). The Project Development Cell (PDC) has been approved to set up investable projects in coordination amid the Central Government and State Governments and thereby grow the pipeline of investible projects in India and raise FDI inflows. The PDC will conceptualize, strategize, implement, and disseminate details with respect to investable projects.

2.2.6. The document “**Aatmanirbhar Bharat: A Journey to Self-Reliance**” (2024), is based on Prime Minister Narendra Modi’s vision and published by the Press Information Bureau of the Government of India, discusses India’s journey towards self-reliance with a special focus on the **Production-Linked Incentive (PLI) scheme**. As of September 2023, the PLI schemes for 14 sectors, such as electronics, telecommunication, pharma, white goods and textiles, have successfully attracted investments totalling over Rs 1 lakh crore. Until November 2023, 746 applications had been approved under these schemes and they have resulted in direct and indirect employment for over 6.4 lakh individuals, contributing to production/sales amounting to Rs 7.80 lakh crore. PLI units have been established in more than 150 districts across 24

states. In the fiscal year 2022-23, incentives worth approximately Rs 2,900 crore have been disbursed. One of the key success stories of the PLI scheme has been the production **shift by Apple from China**.

2.2.7. “**Technology Perspective and Capability Road Map (TPCR) 2018**” published by Ministry of Defence is another important document published in 2018, to provide industry requirements for armed forces till late 2020s. It gives out the quantities, specifications and life cycles of the items required by the defence forces. This document intends to drive the technology development process that the industry may like to pursue over the next 15 years, which will in turn drive the development of new technology. It provides the business community with a bird's-eye view of the technologies and capabilities the Armed Forces are considering using in the near future. The intention of this document is to give the Indian Industry a perspective and an opportunity to make strategic business plans for developing technologies which can be converted into the capabilities required by the forces. However, the document is outdated and needs to be updated in tune with the ICDP and DCAP.

2.2.8. “**The Essential Defence Services Bill, 2021**” enacted by the Government of India, Ministry of Defence another very important policy document that raises the confidence of the defence at large. The Bill, was introduced by the Ministry of Defence, to ensure uninterrupted functioning of defence-related industries and services by prohibiting strikes, lockouts and layoffs in units engaged in essential defence services. The bill plays a critical role in India's Atmanirbhar Bharat initiative by ensuring that defence

manufacturing and operational readiness are not disrupted by labour strikes or workforce shortages. The bill allows the central government to declare any service as essential if its discontinuation threatens national security or disrupts defence production. The bill amends the Industrial Disputes Act, 1947, including essential defence services under public utility services, thereby requiring a mandatory six-week notice before workers can go on strike. Strikes, mass casual leave, or refusal to work overtime in these industries are classified as illegal and can attract penalties, including fines and imprisonment.

2.2.9. Ministry of Commerce and Industry press release on the topic “**Centre spearheads several initiatives under Ease of Doing Business and Reducing Compliance Burden aimed at creating a conducive business environment**” (2023), highlights the various initiatives by the government towards Ease of Doing Business by the various agencies specifically for startup ecosystem, by raising capital and reducing compliance burden. The key focus areas of the initiatives are; firstly, simplification of procedures related to applications, renewals, inspections, filing records, etc., secondly, rationalization by repealing, amending or subsuming redundant laws, thirdly, digitization by creating online interfaces eliminating manual forms and records and finally, decriminalization of minor technical or procedural defaults.

## **2.3. India's Defence Industrial Base:**

**2.3.1.** The book titled “**Indian Defence Industry: An Agenda for Self-Reliance**” by **Laxman Kumar Behera (2016)**, provides detailed insights on the defence industrial base in India, some important issues are;

**2.3.1.1. Ordnance Factories (OFs):** The Ordnance Factories represent India's oldest and largest state-run defence production network, consisting of 39 factories under the Ordnance Factory Board (OFB) and was established in 1775 under British rule. The OFs used to supply 80% of their products to the Indian Army but fulfil less than 50% of the Army's requirements and the production shortfall used to range from 29% to 80%, affecting ammunition supplies. The quality too was a big issue and ₹2,432 crore worth of ammunition reported were reported defective and also led to a major explosion in one of the depots leading to many casualties and huge damages. The products were priced higher than international alternatives due to inefficiency and outdated production methods and their export component was below 1% of total sales, which was significantly lower than DPSUs. Thus, the OFs were corporatised by the government in 2021.

**2.3.1.2. Defence Public Sector Undertakings (DPSUs):** DPSUs form the backbone of India's state-controlled defence manufacturing sector contributing significantly to defence procurement. India has nine DPSUs, categorized as Navratna

companies and include; Hindustan Aeronautics Ltd (HAL) (Largest DPSU, specializing in aircraft and aerospace systems), Bharat Electronics Ltd (BEL) (specialises in defence electronics), Bharat Dynamics Ltd (BDL) (Focus on missile production), Bharat Earth Movers Ltd (BEML) (Manufacturer of heavy vehicles), Mazagon Dock Ltd (MDL), Goa Shipyard Ltd (GSL), Garden Reach Shipbuilders & Engineers Ltd (GRSE), Hindustan Shipyard Ltd (HSL) and Mishra Dhatu Nigam Ltd (MIDHANI) which specializes in advanced materials and alloys. These DPSUs rely heavily on foreign technology and components, and are basically assembling units rather than production factories supported by R%D, for example, HAL's aircraft production is 90% dependent on imported parts. Most DPSUs spend less than 5% of turnover on R&D and own few patents compared to global defence giants like Boeing or Lockheed Martin. Therefore, they are now facing increasing competition from the private sector under the Make in India initiative, raising concerns about their efficiency, R&D capabilities and global competitiveness.

### **2.3.1.3. Defence Research and Development Organisation**

**(DRDO):** The DRDO was established in 1958 by merging the Defence Science Organisation (DSO) with the Technical Development Establishments (TDEs) to create a self-reliant defence R&D ecosystem and over the years they have expanded from 10 laboratories to 52, covering a broad spectrum of aeronautics, missiles, armaments, naval systems, life sciences, electronics, materials and combat engineering.

It operates under the Department of Defence R&D, Ministry of Defence and is led by Director General (DG DRDO) and is responsible to develop both strategic and tactical defence technologies for India's armed forces and dual-use technologies with civilian applications. Their key contributions at the strategic level, include; Agni and Prithvi ballistic missile series, BrahMos supersonic cruise missile (joint Indo-Russian project with a high indigenous component) Ballistic Missile Defence (BMD) program and Nuclear Submarine projects.

**2.3.1.4. Private Sector:** The private sector has played a limited role in defence production until recently, with most manufacturing controlled by DPSUs and Ordnance Factories (OFs). Since 2001, the sector has been opened to private participation and the Make in India initiative gave an impetus to further integrate private industry into major defence projects. However, challenges such as regulatory barriers, lack of incentives and policy inefficiencies persists. Prior to 2001, the private sector was restricted to supplying components, materials and sub-systems. However post-2001, the sector received Industrial Licenses (ILs) to manufacture defence equipment and by 2015, 182 companies issued 307 ILs, but only 50 companies began production, indicating slow policy implementation. The major projects under private participation include; transport aircraft, submarines, artillery guns and heavy mobility vehicles. The private companies have also gone into Joint Ventures (JVs) with foreign defence companies for advanced manufacturing. The private

sector too is highly dependence on imports and the regulatory & licensing still remains an issue. They spend very little on R&D and there is a major skill resource gap as far as the labour is concerned.

**2.3.2.** The publication by the Ministry of Defence and published the Press Information Bureau of India document titled “**Corporatization of Ordnance Factories**” (2021), highlights the corporatisation of the Ordnance Factory Board (OFB) to enhance efficiency, autonomy and innovation within the defence manufacturing sector. This move reorganizes the OFB’s 41 production units into seven Defence Public Sector Undertakings (DPSUs) based on their production specialization; the first one being, **Munition India Limited** (Includes 12 factories producing munitions and explosives), second is the **Armoured Vehicles Nigam Limited** (covers 5 factories involved in military vehicle production), third one is **Advanced Weapons and Equipment India Limited** (comprises 8 factories manufacturing firearms, artillery, and related systems), fourth is **Troop Comforts Limited** (focuses on uniforms, clothing, and related military gear), fifth is **Yantra India Limited** (includes 8 factories providing essential raw materials and manufacturing components), sixth is **India Optel Limited** (involves 3 factories producing advanced optical and electronic equipment) and the last one is **Gliders India Limited** (specialized category for airborne military gear). The aim of this step is to improve efficiency, autonomy and financial viability of the Ordnance Factories.

**2.3.3.** The dissertation titled, “**Critical Analysis of Productivity of Indian Defence MSMEs**” by Air Commodore Karthikeyan Natarajan (2023) assesses

the productivity of Indian MSMEs in the defence sector, pointing out that while MSMEs are crucial to the supply chain, they face challenges like limited access to capital, inadequate infrastructure and regulatory hurdles. The paper recommends reforms in government policies to better support MSMEs, enhance their role in indigenization and improve productivity under the Atmanirbhar Bharat initiative.

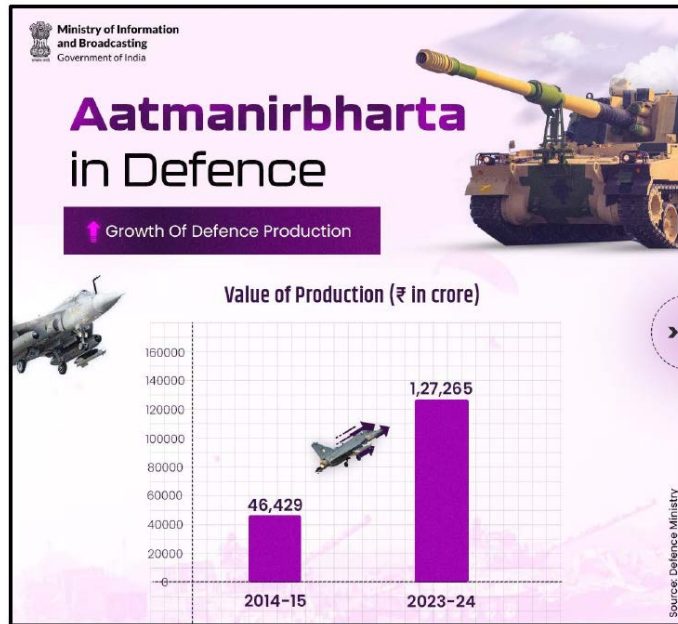
2.3.4. The research paper titled “**An Analysis on Acquisition of Defence Equipment in PPP Model**” by Air Commodore Sanjay Kumar Sharma (2022) evaluates the Public-Private Partnership (PPP) model in defence acquisitions and assesses how India can leverage private-sector efficiency for faster and cost-effective defence procurement. The paper highlights the challenges in current defence procurement include delays in procurement due to bureaucracy because of which the average contract execution time is 5-7 years. The next issue is the high cost-overruns in DPSU-led projects and the author suggests PPP as a solution. Israel and South Korea show that PPP models reduce cost and procurement time and PPPs can increase private sector participation in complex defence projects like shipbuilding, aerospace, etc. In India, L&T’s role in submarine production under PPP and Tata Advanced Systems’ collaboration with Lockheed Martin on C-130 aircraft are very good models. The challenges in adopting PPP models in India are the regulatory restrictions on private companies in strategic defence areas and the slow approval of private-public defence collaborations by MoD.

2.3.5. The study titled, "**Defending India: A Study of the Role of AtmaNirbhar Bharat and Make-in-India Policies**" by Dr. Archana Singh and Kumari Shweta (2023) assesses the impact of Atmanirbhar Bharat and Make-in-India policies on India's defence sector. It concludes that while these initiatives have made significant progress, challenges such as technological obsolescence and infrastructure gaps remain. The paper highlights the potential of these policies to make India self-reliant in defence manufacturing when these reforms are effectively implemented.

2.3.6. The case study titled, "**India's Quest for Defence Indigenisation: A Case Study of the Indian Navy**" by Patel et al. (2023), examines the Indian Navy's success in defence indigenization compared to other branches of the armed forces. It highlights projects like the Indigenous Aircraft Carrier Vikrant and the Arihant submarine as examples of successful collaboration between DPSUs, DRDO and private companies. The paper underscores the importance of institutional frameworks for achieving self-reliance in defence manufacturing.

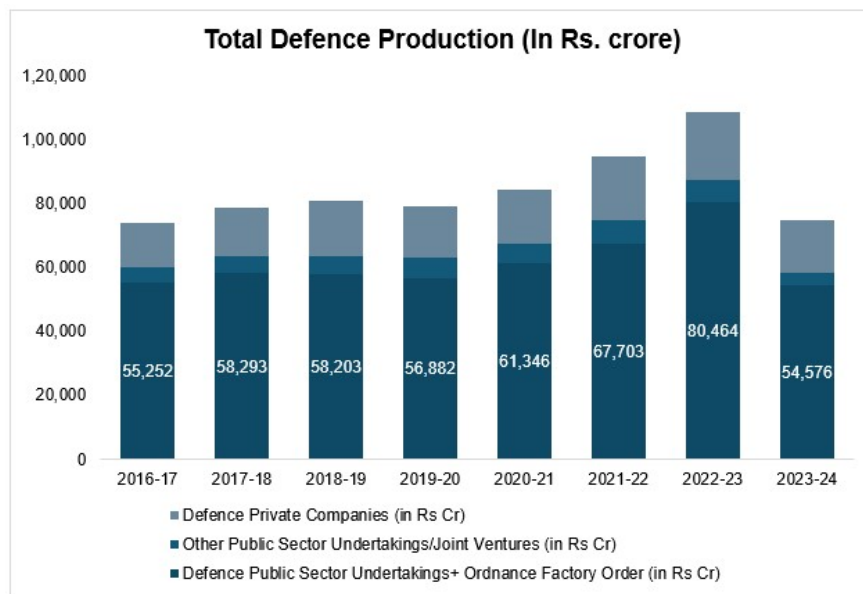
2.3.7. The paper by Air Marshal (Dr.) Rajeev Sachdeva (2022), titled, "**Defence Manufacturing: Journey Towards Atmanirbhar Bharat**", examines India's journey toward self-reliance in defence, critiquing the current state of defence manufacturing and the role of public sector undertakings, the author suggests that despite efforts, India still heavily relies on imports and the private sector needs to play a more significant role in realizing the goals of Atmanirbhar Bharat.

2.3.8. The Press Information Bureau of the Government of India report called “**Atmanirbhar Bharat in Defence**” (Feb 2025), provides official government statistics and policy updates on Atmanirbhar Bharat in the defence sector. It presents a quantitative analysis of defence production growth, key milestones, and policy impact. The key takeaways include India’s defence production milestones, wherein, the indigenous defence production value reached ₹1.27 lakh crore in FY 2023-24, marking a 16.7% YoY increase. Figure 2.1 highlights India’s Value of Defence Production (2014-2024) and Figure 2.2 depicts India’s Total Defence Production (2016-2024) including the private and the public sector. The exports too surged to ₹21,083 crore in FY 2023-24, a record 32% YoY growth and the key export markets include, Philippines, Vietnam, UAE and African nations. Figure 2.3 and 2.4 indicate India’s export (2014-24). Figure 2.5 indicates the export destinations and it is heartening to find USA and France as part of top three destinations for export in addition to Armenia. 79.2% of defence production is attributed to DPSUs and other public enterprises while, private firms, including Tata Advanced Systems, L&T Defence, Adani Defence, and Bharat Forge were responsible for 20.8% of the production. Thus, the Atmanirbhar Bharat initiative has significantly increased India's defence self-reliance, but accelerated investments in high-end military technologies and deeper industry-academia collaboration are essential for achieving complete self-sufficiency.



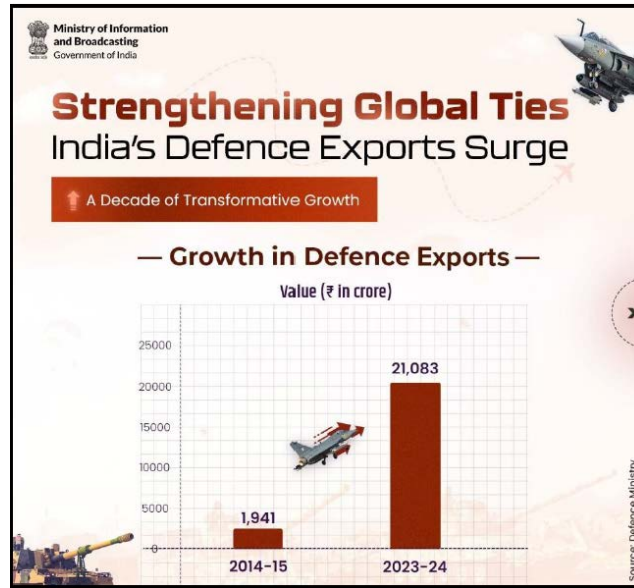
**Figure 2.1: Indias Value of Defence Production (2014-2024)**

(Source: PIB, MoD, Feb 2025)



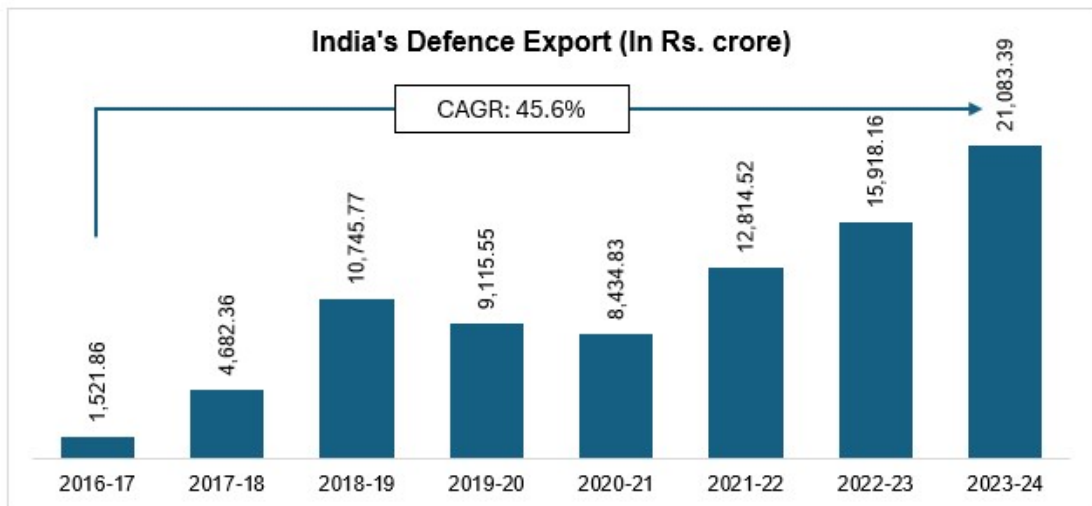
**Figure 2.2: India’s Total Defence Production (2016-2024)**

(Source: PIB, MoD, Feb 2025)



**Figure 2.3: Indias Defence Exports (2014-2024)**

(Source: PIB, MoD, Feb 2025)



**Figure 2.4: Indias Defence Export (2014-2024)**

(Source: PIB, MoD, Feb 2025)



**Figure 2.5: Indias Defence Exports Destinations (2023-2024)**

(Source: PIB, MoD, Feb 2025)

2.3.9. The report by “**Global Innovation Index (GII)**” (2024), by the World Intellectual Property Organization, provides a comprehensive assessment of global innovation trends and ranks economies based on their innovation capabilities and outputs. The report highlights the role of innovation in economic resilience, especially post-COVID-19, and presents a comparative analysis of countries' innovation ecosystems. India’s defence innovation and self-reliance efforts under Atmanirbhar Bharat are also contextualized in the broader global innovation landscape. India has made significant progress in R&D investment, patent filings and defence technology collaborations. India has shown consistent improvements in its Global Innovation Index rankings, being recognized as an innovation outperformer relative to its level of development. In 2020 India ranked 48th, however in 2024 India continues its upward trajectory, ranking first in the lower-middle-income group, followed by Vietnam and the Philippines.

## 2.4. Atmanirbhar Bharat Abhiyan:

2.4.1. The article titled, "**Atmanirbharta in Defence: How has been the Journey So Far? Where are we Headed?**" by Lt. Gen. VK Saxena (2022) evaluates India's progress toward defence self-reliance under the Atmanirbhar Bharat initiative. It highlights how various reforms, including the Defence Acquisition Procedure and increased private sector involvement have contributed to indigenization. The author advocates that, while significant progress has been made in defence manufacturing, India still has a long way to go in achieving complete self-reliance, particularly in high-end technology.

2.4.2. The research paper by Mishra, et al., (2024) titled, "**Journey of Indian Defence Sector towards Self-Reliance and Aatmanirbhar Bharat**" provides a detailed analysis of the progress made by the Indian defence sector toward self-reliance under the Atmanirbhar Bharat initiative. The paper highlights advancements in key areas such as missile technology, cybersecurity and artificial intelligence. It also explores how strategic alliances with global defence companies have helped to bridge technology gaps and enhance indigenous capabilities.

2.4.3. The paper, "**Self-Reliance in Defence Manufacturing in India - A Step Towards Aatmanirbhartha**" by Shrihari Karanth & Vidya Bhat (2024), emphasizes the importance of self-reliance in India's defence manufacturing sector, by highlighting how India has become the world's third-largest military spender. The study delves upon the government initiatives to boost domestic

production, reduce imports and increase exports and its rather ambitious goal of achieving \$ 5 billion in defence exports by 2025. The paper further explains how public-private partnerships and defence budget allocations are key to achieving these targets under the Atmanirbhar Bharat initiative.

2.4.4. The article by Prerna Sharma (2024), titled, "**The Role of Atmanirbhar Bharat and Make-in-India in the Defence Sector**" focuses on the role of the Atmanirbhar Bharat initiative and the Make-in-India policy in transforming India's defence sector. It outlines how indigenous production has increased with the issuance of indigenization lists and enhanced public-private collaboration. The article emphasizes the growth in defence exports, R&D and efforts to create a sustainable defence industrial ecosystem.

2.4.5. The paper on "**Growth Challenges for India's Defence Manufacturing Sector**" by Girish Linganna (2024), examines the challenges India faces in becoming self-reliant in defence production. Key issues include reliance on imports, slow adoption of indigenous technologies and inadequate infrastructure. The document outlines the government's efforts to address these problems through policies like Make in India and Atmanirbhar Bharat. However, overcoming these challenges requires deeper reforms in the procurement process and stronger public-private partnerships.

2.4.6. The, India Brand Equity Foundation (2024) paper titled, "**Building a Self-Reliant Defence Industry: Enhancing Indigenous Defence Manufacturing Capability**" discusses the growing capability of India's

defence manufacturing industry and emphasises the need for self-reliance in the sector. The paper highlights the government's efforts to boost defence exports and reduce import dependency by promoting private sector participation and fostering innovation through initiatives like the DAP and DPEPP 2020.

2.4.7. The dissertation titled, "**Atma Nirbharta Through Indigenisation: a Study of Manufacturing and Procurement Policy in Defence Sector**" by Sandeep Kumar (2023) focuses on indigenization in the defence sector as a key element of Atmanirbhar Bharat. It examines policies like the DAP 2020, DPEPP 2020, etc, and recommends the need for better synchronization between public and private sectors for India to achieve self-reliance. The dissertation also recommends improvements in defence manufacturing policies to foster innovation and technological advancements.

2.4.8. The research paper titled, "**Atmanirbhar Bharat: Indigenization for Defence Forces**" by Ashok Kumar Panda (2023), highlights the important role of indigenization in defence under the Atmanirbhar Bharat initiative. It stresses the challenges faced by India's defence forces, including the lack of infrastructure, inadequacy of capital for modernization and dependency on foreign OEMs. The paper strongly recommends public-private partnerships (PPP), adoption of new technologies like AI and collaborations with academia to address these challenges.

## 2.5. Comparison with other Global Defence Models:

2.5.1. Two reports published by RAND, both titled, “**Assessing Systemic Strengths and Vulnerabilities of China’s Defence Industrial Base**” written by Weinbaum. et.al. (2022), is a detailed analysis of the strengths, vulnerabilities and systemic issues in China’s defence industrial base (DIB). Strengths of China's DIB are, that the DIB is dominated by state-owned enterprises (SOEs) like NORINCO, AVIC etc, these government-controlled defence firms dominate global arms exports, massive state-backed R&D investments, over 90% of defence needs met domestically; reverse engineering used for foreign tech acquisition and most importantly the Military-Civil Fusion (MCF) model that it follows has been of great assistance in developing self-sufficiency and also made it the fourth largest exporter of defence equipment. The main weaknesses of the DIB are bureaucratic inefficiencies in decision-making and reliance on imported raw materials.

2.5.2. An article written on “**Israel defence sector – A role model for India**” by Razdan, D. (2019) for the Institute for Defence Studies and Analyses, gives out great insights into the DIB of Israel, starting with the evolution of the defence industry, when it was completely dependent on foreign procurement in the 1950s-60s and how it went on to develop its domestic capabilities in missiles, radar, electronic warfare, AI and cyber defence. The major defence enterprises are the Israeli Aerospace Industry (IAI), Rafael Advanced Defence Systems and Elbit Systems. The writer also gives important lessons for India in the field of defence production.

2.5.3. The article titled, “**Israel’s Self-Reliance in Defence**” written by Lappin Y (2025), discusses Israel’s shift towards achieving self-sufficiency in defence production, particularly in the wake of recent conflicts as an aftermath of the Hamas attacks. The Israeli Defence Ministry has signed two major contracts with Elbit Systems, worth approximately 1 billion Israel New Shekel (Israeli currency), under the Blue and White Independence Program. These contracts signify Israel's commitment to reducing reliance on foreign suppliers while strengthening domestic manufacturing. But, Israel’s quest for self-reliance in defence dates back to France’s 1967 arms embargo, when, they launched the Blue and White Independence Program to address supply chain vulnerabilities and enhance research in dual-use technologies. However, they too face some challenges in achieving 100% self-sufficiency.

2.5.4. “**Strategy for Integrating the Private Sector in National Cyber Defence**” written by Even, S. (2015), is another article that gives out the private sector led defence model of Israel. The private sector is both a consumer and a contributor to national cyber security and the private firms collaborate with the government on threat detection and mitigation.

2.5.5. The article "**Evolution of South Korean Defence Industry and Its Impact on South Korean Foreign Relations**" written by Ranjan, A. (2023) in the International Journal of Advanced Research in Management and Social Sciences, gives out the historical evolution and how South Korea initially, relied on the USA for its security based on the Mutual Defence Treaty of 1953. However, in 1960s Nixon Doctrine reduced American military presence in

Asia, compelling South Korea to work towards establishing self-reliance in defence manufacturing. To begin with, the industry focused on ammunition and small arms production under American technical assistance. The 1970s witness significant government investment, and by 1980s, South Korea was manufacturing major equipment like, destroyers, helicopters, missiles and howitzers. Strategic cooperation with the USA and later Russia (post 1990s), facilitated technological advancements, including missile development. Since the 2000s, South Korea has focused on high-tech weaponry and exports and their military exports grew from \$1.2 billion (2011-2015) to \$3.8 billion (2016-2020).

2.5.6. The article titled, "**How South Korea's Defence Industry Transformed Itself into a Global Player**" by Arthur, G. (2023), highlights the rapid growth of exports by South Korea from \$7.25 billion in 2021 to \$17.3 billion in 2022. South Korea aims to be the fourth-largest global arms supplier beating the Chinese. The SIPRI ranked South Korea as the 9th largest arms exporter for the period 2018-2022. The major factors behind the immense success are, high-volume and fast production, technology customization and local partnerships and most importantly competitive pricing and usage of advanced technology.

## **2.6. Challenges in Achieving Self-reliance for India:**

2.6.1. Laxman Kumar Behera (2024) in his article, "**India's Defence Industry: Achievements and Challenges**" evaluates the achievements of

India's defence industry under the Atmanirbhar Bharat initiative. However, he goes on to highlight that, while there has been significant improvement in defence production and exports under the initiative, there are many challenges like scaling up production to meet the procurement needs of the armed forces remain. The paper calls for reforms in R&D, faster decision-making in procurement and enhanced collaboration between the public and the private sectors.

2.6.2. "**Challenges and Opportunities in the Indian Defence Sector**", the paper by Ravichandran Ramadass, (2023) provides a strategic analysis of India's defence sector, highlighting key opportunities and challenges, such as, inadequate indigenous technological capabilities, reliance on foreign imports, etc. Opportunities discussed include increasing private sector involvement, especially in manufacturing and R&D leveraging government initiatives like Atmanirbhar Bharat to promote self-reliance. The paper emphasizes the need for reforms in procurement processes and regulatory frameworks to accelerate defence indigenization.

2.6.3. The paper, "**Atmanirbhar Bharat: Indigenisation in Defence Sector**" by Col. Sharad Rastogi (2023), too explores the challenges for India in achieving self-reliance in the defence sector. The paper discusses India's reliance on imports and the structural inefficiencies within the defence industrial base, particularly the lack of private sector involvement as one of the major factors. The paper highlights recent reforms aimed at promoting

private sector participation, innovation and R&D, etc, which are crucial to achieving the goals of self-reliance in defence manufacturing.

## **2.7. Conclusion:**

The review of government publications, policy documents and scholarly articles in the chapter highlights that India's journey towards defence self-reliance under the Atmanirbhar Bharat initiative is multi-faceted and evolving. The literature collectively outlines the historical dependency on foreign defence imports, with India consistently ranking among the top global arms importers. The policy interventions such as the DAP 2020, DPEPP 2020, the Positive Indigenisation Lists, etc are repeatedly highlighted across government sources and articles by various scholars as crucial steps towards reducing the dependency on imports.

A recurrent theme is the emphasis on the strategic importance of indigenisation, with significant roles assigned to both public sector undertakings (DPSUs) and private enterprises spearheaded by the MSMEs. The literature also identifies key gaps, including limited participation of private industry in R&D, technology transfer bottlenecks, delays due to bureaucratic processes, etc. Comparative insights from global standards, such as Israel's agile defence clusters and China's Military-Civil Fusion model further underscore areas where India could accelerate reforms, particularly by fostering stronger private-sector partnerships and improving innovation ecosystems.

### **CHAPTER 3**

#### **DEFENCE INDUSTRIAL BASE IN INDIA**

##### **3.1. Introduction:**

The defence industrial base (DIB) in India serves as the backbone of the country's national security and the objective of achieving self-reliance in defence manufacturing. India, since independence, pursued achieving self-sufficiency in defence production through state-owned enterprises. However, despite significant investment and policy initiatives, India remains one of the world's largest arms importers (SIPRI, 2023). However, India's defence industrial base has undergone a transformative shift over the last two decades, moving from a state-dominated structure to a more competitive and diversified sector that integrates private industry, foreign investments and indigenous technological advancements. This evolution has been driven by a series of policy reforms, starting with the opening of the defence sector to private participation in 2001. This was followed by the much touted "Make in India" initiative in 2014. Later, in 2018 India went ahead with the establishment of two Defence Industrial Corridors, one in state of Uttar Pradesh and another one in Tamil Nadu. The Make in India initiative injected fresh momentum into defence manufacturing, promoting public-private partnerships, foreign collaborations and indigenous research and development (R&D). Despite these efforts, India remained one of the largest importers of defence equipment, underscoring the need for a more robust domestic production ecosystem (Behera, 2016).

This chapter analyses India's defence ecosystem, including Evolution and the Role of Public Sector Units, like Ordnance Factories, Defence Public Sector Undertakings, Defence Research and Development Organisation etc. It also talks about the Role of Private Industry in India's Defence Manufacturing and discusses the Challenges in Achieving Self-reliance in Defence.

### **3.2. Evolution and the Role of Public Sector Units:**

The origins of India's defence production can be traced back to the colonial era, when the British had established OFs in undivided India. However, real progress began after independence when the government adopted a state-led approach to defence manufacturing. The establishment of Defence Public Sector Undertakings (DPSUs) and Ordnance Factories (OFs) formed the cornerstone of India's defence production (Behera, 2016). By the 1980s, India developed an extensive public sector-driven defence ecosystem, initially catering for the country's basic military needs and over the years these organizations expanded to produce sophisticated weapon systems. These entities were monopolized by state control. However, their inefficiencies, outdated technology and limited R&D capabilities contributed to continued reliance on imports (Behera, 2016).

#### **3.2.1. Ordnance Factories (OFs):**

The OFs manufactured nearly 1,000 different defence products, including; Small arms (rifles, pistols, machine guns, tank guns, artillery), Ammunition (missile warheads, rockets, grenades, propellants), Armoured

vehicles (T-72 and T-90 tanks, infantry combat vehicles) and Optoelectronics & fire control systems. They were historically dependent on foreign technology transfers, with low indigenous innovation and less than 1% of turnover on R&D, which is much lower than global standards. **Table 3.1.** shows the gap between Value of Production (VoP) and Value of Sales (VoS). This mismatch indicates that while production levels remain high, actual sales and procurement of indigenously developed products are lower than expected, leading to inventory accumulation and cost inefficiencies.

Year	VoP (₹ Cr.)	VoS (₹ Cr.)	% Supplied to Army
2009-10	12,309	8,715	80%
2011-12	17,236	12,391	78%
2013-14	15,992	11,123	78%
2014-15	16,364	11,364	80%

**Table 3.1: Value of Production and Value of Sales by OFs (2009-15)**

(Source: Compiled from Behera, 2016)

80% of OFB's sales was to the Indian Army, but it met less than 50% of the Army's total needs. There were also accounting system issues, as the OFs do not follow commercial accounting, leading to a lack of transparency in profits and expenditures. The OFs frequently failed to meet production targets, leading to severe shortages of critical ammunition and equipment and the Army has raised concerns over inflated production capacity claims by OFs. The **Table 3.2.** depicts the execution of orders by the OFs.

Year	No. of Items Ordered	No. of Items Produced	Shortfall
2007-08	628	360	43%
2009-10	605	300	50%
2011-12	982	195	80%

**Table 3.2: Delays and Shortfall in Orders by OFs (2007 – 12)**

(Source: Behera, 2016)

The exports by the OFs were woefully less and remained **less than 1% of total sales**, which was significantly lower than DPSUs like HAL, BEL, etc.

**Table 3.3.** depicts the exports by OFs.

Year	Exports (₹ Cr.)	No of Factories Involved
2005-06	14.66	11
2010-11	35.70	8
2013-14	18.00	8

**Table 3.3: Exports by Ordnance Factory Board (2005 – 14)**

(Source: Behera, 2016)

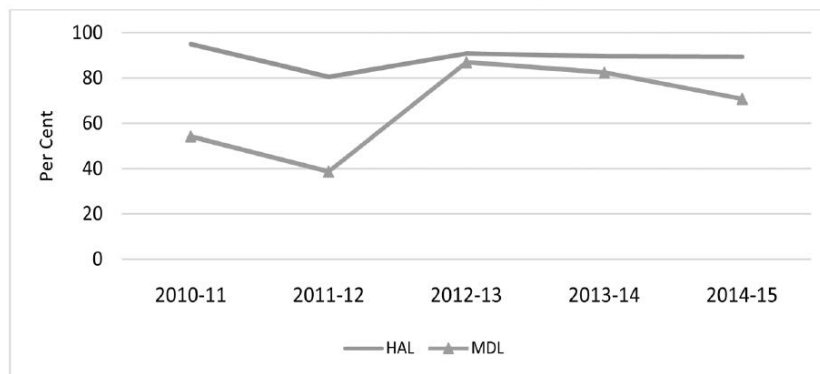
The Ordnance Factory Board (OFB), which managed 41 ordnance factories, faced heavy criticism because of the delays, cost overruns and quality issues. This led to the corporatization of the OFB in 2021 (MoD, 2021). The 41 production units were converted into seven Defence Public Sector Undertakings (DPSUs) based on their production specialization; the

first one being, **Munition India Limited** (includes 12 factories producing munitions and explosives), second is the **Armoured Vehicles Nigam Limited** (covering 5 factories involved in military vehicle production), third one is **Advanced Weapons and Equipment India Limited** (comprising 8 factories manufacturing firearms, artillery, and related systems), fourth is **Troop Comforts Limited** (focuses on uniforms, clothing, and related military gear), fifth is **Yantra India Limited** (includes 8 factories providing essential raw materials and manufacturing components), sixth is **India Optel Limited** (involves 3 factories producing advanced optical and electronic equipment) and the last one is **Gliders India Limited** (a specialized category for airborne military gear). The aim of this step is to improve efficiency, autonomy and financial viability of the Ordnance Factories.

### **3.2.2. Defence Public Sector Undertakings (DPSUs):**

The DPSUs, including Hindustan Aeronautics Limited (HAL), Bharat Electronics Limited (BEL), Bharat Dynamics Limited (BDL), etc. played a critical role in indigenous defence production, particularly in aerospace, missiles and electronics. However, their dominance often restricted private sector entry, limiting competition and innovation (Behera, 2016). DPSUs rely heavily on foreign technology and components. **Figure 3.1** indicates the import share of parts, components, and raw materials consumed by HAL and MDL, wherein the figure for HAL is 90-95% and for MDL is ranging between 40 to 70%. Most DPSUs spend less than 5% of turnover on R&D and own few patents compared to global defence giants like Boeing or Lockheed

Martin. **Table 3.4** indicates the amount spent by the various DPSUs on R&D. **Table 3.5** depicts the patents and copyrights held by the DPSUs and the OFs put together. The DPSUs contribution to exports too is dismal and they contribute only 5% of total turnover from exports. **Table 3.6.** shows the exports by DPSUs.



**Figure 3.1: Import Share to Cost: HAL and MDL**

(Source: Behera, 2016)

<i>DPSU</i>	<i>R&amp;D expenditure</i>	
	<i>Rs crore</i>	<i>as % of sales</i>
HAL	1047	6.7
BEL	549	8.2
BEML	83	2.6
MDL	1.5	0.1
GRSE	3.5	0.2
GSL	6.5	0.9
HSL	...	...
BDL	23	0.8
MIDHANI	8.5	1.3
All DPSUs	1722	5.0

**Table 3.4: Expenditure in R&D (2014-15)**

(Source: Behera, 2016)

<i>DPSU / OFs</i>	<i>No. of Patents or Copyright</i>
HAL	6
MIDHANI	5
BEML	3
BDL	2
BEL	6
OFs	1
Total	23

**Table 3.5: No of Patents/ Copyright held by DPSUs and OFs (2012)**

(Source: Behera, 2016)

<b>DPSU</b>	<b>Value of Production (₹ Cr.)</b>	<b>Exports (₹ Cr.)</b>
HAL	16,289	414.8
BEL	6,695	358.5
BEML	3,130	258.5
MDL	2,490	279.5
GRSE	2,308	0.0

**Table 3.6: Exports by DPSUs (2014)**

(Source: Behera, 2016)

### **3.2.3. Defence Research and Development Organisation (DRDO):**

The DRDO ecosystem consists of over 52 laboratories, covering a broad spectrum of aeronautics, missiles, armaments, naval systems, life sciences, electronics, materials and combat engineering. It operates under the Department of Defence R&D, Ministry of Defence and is led by Director General DRDO and is responsible to develop both strategic and tactical defence technologies for India's armed forces and dual-use technologies with

civilian applications. Their key contributions at the strategic level, include; Agni and Prithvi ballistic missile series, BrahMos supersonic cruise missile (joint venture between India and Russia - a project with a high indigenous component) Ballistic Missile Defence (BMD) program and Nuclear Submarine projects. The major defence platforms designed by them include; Light Combat Aircraft (LCA) Tejas, Main Battle Tank (MBT) Arjun (criticized for high import content - 55%), Akash Surface-to-Air Missile System, Pinaka Multi-Barrel Rocket Launcher (MBRL), etc. Advanced R&D initiatives by the DRDO include; Hypersonic Technology Demonstrator Vehicle (HSTDV), Airborne Early Warning & Control (AEW&C) System, Electronics and Cyber Warfare Systems, AI-based Warfare Technologies for unmanned systems, autonomous weapons and AI-driven defence solutions, etc. However, they are criticised for very high dependency on foreign technology, project delays and cost overruns, lack of synergy with the armed forces, limited innovation and patents, unreliability, etc. **Table 3.7** indicates the Import content in the DRDO developed/underdevelopment systems. **Table 3.8** shows the project delays and cost overrun cases.

<i>System</i>	<i>Import Content (%)</i>	<i>System</i>	<i>Import Content (%)</i>
Pilotless Target Aircraft (PTA), Lakshya	5-7	Supersonic Cruise BrahMos Missile	65
Remotely Piloted Vehicle (RPV), Nishant	10	Long Range Surface to Air Missile (LR-SAM)	60
Aircraft Arrestor Barrier	5	Multi Barrel Rocket System, Pinaka	10
Light Combat Aircraft (LCA)	40	Main Battle Tank, Arjun	55
Airborne Early Warning & Control (AEW&C) System (excluding aircraft)*	67	Radars	10
Combat Free Fall (CFF) System	35	Electronic Warfare Systems	5-30
Parachutes	0	Sonars	5-30
Heavy Drop System	10	Pocket Dosimeter (PDM)	12
Agni Missile	15	Portable Dose Rate Meter	9
Prithvi Missile	15	Roentgenometer	6
Surface to Air Missile, Akash	10	Nuclear, Biological and Chemical (NBC) Recce Vehicle	5
Anti-tank Missile, Nag	30	NBC Water Purification System	5

**Table 3.7: Import Content: Systems Developed/Underdevelopment by DRDO (2016)**

(Source: Behera, 2016)

<i>Project Name</i>	<i>Date of Sanction</i>	<i>Original Likely Date of Completion</i>	<i>Revised Date of Completion</i>	<i>Original Estimated Cost (Rs crore)</i>	<i>Revised Cost (Rs crore)</i>
LCA Phase II	November 2001	December 2008	December 2015	3301.78	5777.56
Kaveri Engine	March 1989	December 1996	December 2009	382.81	2839.00
Long Range Surface-to-Air Missile (LRSAM)	December 2005	May 2012	December 2015	2606.02	No revision
Airborne Early Warning & Control (AEW&C) System	October 2004	October 2011	December 2015	1800.00	2520.00
Naval Light combat Aircraft (LCA Navy Phase-I)	March 2003	March 2010	December 2014*	948.90	1714.98
Air-to-Air Missile System: Astra	March 2004	February 2013	August 2016	955.00	No revision
Nirbhay – Development & Flight Trials	March 2004	February 2013	August 2016	56.93	102.28

**Table 3.8: Cases of Time and Cost Overruns by DRDO (2016)**

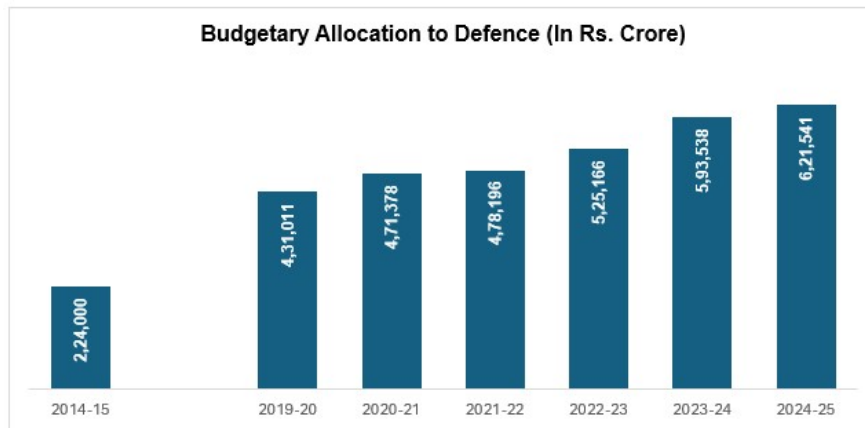
(Source: Behera, 2016)

DRDO also plays a major role in Technology Transfers and Industrial Collaborations with over 500 defence technologies transferred to industries, boosting local defence manufacturing and R&D partnerships with 800 plus Indian companies and 100 plus academic institutions. 80% of DRDO's stores budget spent domestically, fostering indigenous industrial capacity. However, many DRDO-developed systems still rely on imported critical components, also project delays and cost overruns are a regular feature, they are also blamed for lack of synergy with the Armed Forces and creating equipment that no-one demanded or wanted. The DRDO also faces Human Resource challenges, like high scientist attrition rate due to better private sector opportunities and slow career progression and budgetary constraints. India lags behind global players like DARPA (USA) and Israel's Office of Chief Scientist (OCS) in fostering radical innovation, for example DRDO holds only 1,400 patents, compared to 5,600 patents by CSIR.

### **3.2.4. Policy Reforms, Make in India (2001–2019):**

A major shift in the Indian defence manufacturing occurred in 2001 when the Indian government opened the defence sector to private participation, allowing domestic companies to manufacture defence equipment under industrial licensing. This was further augmented by the introduction FDI policies, initially capping investment at 26%, which was later increased to 49% in 2014 and finally to 74% in 2020, under the automatic route to attract global defence manufacturers.

The Make in India initiative, launched in 2014, marked a significant milestone in India's defence manufacturing strategy, aiming to reduce import dependency and promote indigenous production, however, it was not focused on self-reliance in the defence sector. Make in India initiative, with a strong focus on enhancing industrial capabilities, fostering innovation and creating world-class infrastructure, the initiative aimed to position India as a key player in the global economy. Supported by major programs like Production Linked Incentive (PLI) Schemes, PM GatiShakti, the National Logistics Policy, comprehensive tax reforms like the Goods and Services Tax (GST), prioritization of Buy Indian and Buy & Make (Indian) procurement categories in the Defence Procurement Procedure (DPP) (MoD, 2016) and Increased FDI cap under the automatic route. The defence budget too has been increased manifold (2.4 times) since the launch of the initiative as indicated in the **Figure 3.2.**



**Figure 3.2: India's Defence Budget (2013-2025)**

(Source: India Brand Equity Foundation (IBEF), July 2024)

The Defence Procurement Procedure (DPP) was revised multiple times (2002, 2006, 2011, 2016, and 2020) to streamline acquisitions and promote private sector integration. The DAP 2020 itself has been modified many times based on the felt need.

### **3.2.5. Industrial Corridors and Skill Development:**

Recognizing the need for cluster-based industrial growth, the government launched two Defence Industrial Corridors (DICs) in Uttar Pradesh and Tamil Nadu in 2018, aimed at creating self-sustaining defence ecosystems. These corridors are expected to attract ₹20,000 crore (\$2.5 billion) in investments and generate over 100,000 jobs (Invest India, n.d.).

Skill development has been another critical area. The Strategic Manufacturing Skills Council (SMSC) was established in 2014–15 in collaboration with the National Skill Development Corporation (NSDC) and

the Confederation of Indian Industry (CII) to train a specialized workforce for the defence sector. However, 53% of surveyed defence industry professionals felt that current training programs are inadequate, particularly in high-tech defence engineering.

### **3.2.6. Role of Private Industry in India's Defence Manufacturing:**

The liberalization of India's defence sector in 2001 paved the way for private industry participation, marking a shift from public sector dominance to a more competitive and diversified defence ecosystem. Over the past two decades, private industries, spearheaded by Tata Advanced Systems, Larsen & Toubro, Mahindra Defence, Bharat Forge and Adani Defence have emerged as key players in aerospace, land systems, naval platforms and electronic warfare technologies. The Strategic Partnership Model (SPM) has enabled Indian private firms to partner with global defence majors in high-value projects, including submarines, fighter aircraft, and armoured vehicles.

Private defence firms have established JVs with foreign OEMs, contributing to technology transfer, localized production and integration into global supply chains. Prominent JVs by the Indian industry include; Tata Advanced Systems and Lockheed Martin, manufacturing C-130J Super Hercules airframe components and F-16 wing production (SIPRI, 2023), Mahindra Defence and BAE Systems for joint production of M777 howitzers (SIPRI, 2023), Adani Defence and Elbit Systems (Israel) for collaborating on drones and electro-optic systems (SIPRI, 2023), etc.

The private sector exports have grown significantly, with industries supplying radar systems, ammunition, armoured vehicles and aerospace components to customers around the world. According to MoD data, private firms now account for over 20% of India's defence exports (Press Information Bureau, 2023). However, despite these achievements, private players face bureaucratic hurdles, lack of long-term procurement contracts and delays in financial incentives under defence policies.

### **3.3. Challenges in Achieving Self-reliance in Defence:**

Despite policy initiatives, India's defence sector faces persistent challenges, including;

**3.3.1. High Import Dependence:** India remains among the top three arms importers globally, with 45% of its defence acquisitions sourced from abroad (SIPRI, 2023).

**3.3.2. R&D Deficiency:** DRDO's budget allocation remains below 6% of total defence spending.

**3.3.3. Low Export Competitiveness:** India's defence exports are minimal compared to global leaders.

**3.3.4. Complex Procurement Process:** Lengthy bureaucratic procedures delay private sector participation.

**3.3.5. Skill Gaps:** Despite Skill India, India still lacks an advanced defence-specialized workforce.

**3.3.6. Bureaucratic Delays and Policy Inconsistencies:** The procurement process remains complex and slow, leading to delays in contract execution.

**Table 3.6.** below indicates the delay in approval of cases.

<i>Entity</i>	<i>Item</i>	<i>Application Date</i>	<i>Remarks*</i>
Micron Instruments Pvt. Ltd	Shells, Small arms, Ammunition fuses, etc.	28 December 2006	Comments from MHA received on 20 June 2006 after two reminders. Comments from DDP, DSIR and state government are yet to be received. Second reminder sent to DDP on 7 July 2011.
Bharat Heavy Electricals Ltd (BHEL)	Small arms and components	31 January 2007	Comments from DDP, MHA, DSIR and state government are yet to be received.
Kirloskar Pneumatic Co. Ltd	Design and manufacture of warships, combat vehicles, airborne equipment, arms and armaments, etc.	26 March 2008	Comments from state government and DDP received on 11 June 2008 and 14 October 2009, respectively. Comments from MHA are yet to be received after a reminder on 14 June 2011.
Anjani Technoplast Ltd	Manufacture and assembly of UAV	16 April 2009	Comments received from DDP and MHA on 16 April 2010 and 3 January 2012, respectively. Comments from DSIR and state government are yet to be received.
Tata Motors	Overhaul and upgrade of Armoured Fighting Vehicles/Infantry Combat Vehicles/Main Battle Tanks, etc	8 June 2010	DDP comments were received on 2 March 2012, after three reminders. Comments from DSIR and state government are yet to be received.
NOVA Integrated System Ltd	Electronic Warfare Systems	13 July 2010	Comments from DDP received on 11 August 2011 without any reminder. Comments from MHA are yet to be received after one reminder on 6 June 2011. Comments from DSIR and state government are also yet to be received.

**Table 3.9: Cases of Delay in Approval of IL (2013)**

(Source: Behera, 2016)

**Table 3.10** indicates the delay in acquisition pre-CNC and **Table 3.11** indicates post-CNC stage.

<i>Stage of Procurement</i>	<i>Average Time (Weeks)</i>	
	<i>As per DPP</i>	<i>Actual Time Taken</i>
Acceptance of Necessity	–	–
Initiation of draft RFP for collegiate vetting at MoD	4	8
Issue of RFP	4	10
Pre-bid meeting	6	6
Dispatch of pre-bid reply	3	4
Receipt of responses	3	6
Completion of TEC report	12	20
Acceptance of TEC report	4	4
Completion of field evaluation (Trials)	20-45	40
Completion of TOEC	4-8	30
Acceptance of TOEC	4	4
Completion of Trials/Staff Evaluation	4	5
Completion of Trials/Staff Evaluation report	4	4
Acceptance of TOC report (if applicable)	4	5

**Table 3.10: Cases of Delay pre-CNC Stage (2013)**

(Source: Behera, 2016)

<i>Stage of Procurement</i>	<i>Average Time (Weeks)</i>	
	<i>As per DPP</i>	<i>Actual Time Taken</i>
Contract Negotiation Committee (CNC)	18-26	36
CFA Approval	4-16	13.5
Signing of Main and Offset Contract	02	05

*Note:* This is with respect to 27 procurement cases of the IAF.

*Source:* Standing Committee on Defence, *Demands for Grants 2014-15*, Report No. 4, p. 17.

**Table 3.11: Cases of Delay post-CNC Stage (2013)**

(Source: Behera, 2016)

**3.3.7. Technology Transfer and Indigenous R&D Limitations:** The lack of domestic high-tech expertise hinders the complete absorption of transferred technologies.

**3.3.8. Financial and Infrastructure Constraints:** Defence manufacturing clusters require better infrastructure, financing models, and incentives to attract investment.

#### **3.4. Conclusion:**

India's defence industrial base has evolved significantly over the past two decades, driven by public sector modernization, policy reforms, private sector participation and 'Make in India' initiatives. However, inefficiencies in public sector production, continued reliance on imports, limited exports, shortage of investment in R&D, etc, remain key challenges. Addressing these issues through technology development, workforce training, and strategic investments will be crucial in ensuring India's self-reliance in defence manufacturing.

## **CHAPTER 4**

### **POLICY FRAMEWORK & GOVERNMENT INITIATIVES FOR** **ATMANIRBHAR BHARAT**

#### **4.1. Introduction:**

India has long relied on imports to meet its defence requirements, making it one of the world's largest arms importers (SIPRI, 2023), therefore, achieving self-reliance in defence manufacturing has been a strategic goal for decades and successive governments have introduced multiple policy frameworks to reduce import dependency and foster indigenous capabilities. The Atmanirbhar Bharat initiative has further strengthened these efforts, focusing on developing a strong defence industrial base. A robust policy framework is essential for reducing import dependence, fostering indigenous innovation and ensuring a sustainable defence industrial base.

The Defence Acquisition Procedure (DAP) 2020, the Defence Production, Export Promotion Policy (DPEPP) 2020, the FDI in defence policy, positive indigenization list, etc., form the backbone of India's defence policy framework. In addition to these, the government has taken many other initiatives towards improving the ease of doing business, infrastructure development, etc. This chapter discusses the various Important Policies in India concerning defence sector including the Defence Acquisition Procedure, Defence Production & Export Promotion Policy, Foreign Direct Investment policy, Defence Industrial Corridors, etc. The chapter also discusses the various initiatives undertaken by the government under Atmanirbhar

Bharat initiatives and others to promote defence production and the chapter also evaluates the policies of various countries in comparison to India. Finally, the chapter analyses the Challenges in Policy Implementation in India.

## **4.2. Important Policies in India:**

**4.2.1. Defence Acquisition Procedure (DAP) 2020:** The Defence Acquisition Procedure (DAP) 2020, which replaced the Defence Procurement Procedure (DPP), is designed to streamline procurement and promote indigenization. The government has been very proactive and the DAP 2020 has undergone many amendments based on the experience. The latest amendment dated 16 February 2024, introduces new guidelines in defence offset and introduces amendments to promote procurement of advanced technology from startups and MSMEs. Key highlights include;

**4.2.1.1. Preference for Indigenous Procurement:** Categories such as Buy (Indian–Indigenously Designed, Developed, and Manufactured, IDDM) and Buy (Indian) have been prioritized to ensure that a majority of acquisitions are sourced from Indian companies.

**4.2.1.2. Simplified Offset Obligations:** Offsets have been removed for Government-to-Government (G2G) and inter-governmental agreements reducing bureaucratic delays.

**4.2.1.3. Leasing as a Procurement Model:** To reduce financial burdens, leasing has been introduced as an alternative to direct procurement.

**4.2.1.4. Strategic Partnership Model (SPM):** Encourages domestic private firms to collaborate with foreign OEMs to manufacture advanced platforms such as fighter jets, submarines and helicopters.

**4.2.1.5. Public Private Partnership (PPP) Model:** The government has been giving a push towards Public Private Partnership in a big way. The PPP model has worked wonderfully in many projects of national importance like the Passport Seva, GSTN, Aadhar etc, and has great potential in the defence field as well.

In **Expert Opinion Survey**, the experts in the field, suggest that while DAP 2020 is a step in the right direction, significant reforms are needed. Respondents emphasized the need for greater R&D incentives, streamlined procurement processes and enhanced private sector engagement. Furthermore, many experts criticized the reliance on L1 (Lowest Bidder) contracts, advocating for a quality-over-cost approach in defence acquisitions. In relation to the revised offset obligations, 37% of the experts believe that the decision is good, a majority of them (48.1%) believe that the offset obligations should be restrict to transfer of technology (Annexure D). Details of the recommendations by the experts have been enumerated in the next chapter.

**4.2.2. Defence Production & Export Promotion Policy (DPEPP) 2020:**

The DPEPP 2020 aims to enhance India's defence production capabilities and boost exports to at achieving a turnover of ₹1.75 lakh crore (\$25 billion), including ₹35,000 crore (\$5 billion) in defence exports by 2025 (MoD, 2021).

Major focus areas include;

**4.2.2.1. Indigenization of Defence Equipment:** Expanding the Positive Indigenization List, which prohibits import of specific defence equipment to promote local production.

**4.2.2.2. Support to MSMEs and Startups:** Expanding financial and regulatory support to increase MSME participation in defence manufacturing.

**4.2.2.3. Export Promotion:** Simplifying licensing procedures and enhancing the role of Defence Attaches (DAs) in identifying export opportunities and also providing them financial assistance to promote Indian defence exports.

**4.2.2.4. R&D Collaboration:** Strengthening the Innovations for Defence Excellence (iDEX) initiative to fund startups and research institutions.

However, in the **Expert Opinion**, the experts believe that DPEPP lacks strong incentives for industry participation, and procedural bottlenecks make

export approvals cumbersome (Annexure D). Details of the recommendations by the experts have been enumerated in the next chapter.

**4.2.3. Foreign Direct Investment (FDI) Policy:** To attract global defence firms, the FDI cap in defence has been increased from 49% to 74% under the automatic route and up to 100% with government approval for technology-intensive projects. This aims to; firstly, encourage technology transfers and joint ventures, secondly, facilitate co-development and co-production of high-end weapon systems and finally, reduce dependency on imports by involving global players in India's defence ecosystem. More than 49% of the experts consider 74% FDI adequate (Annexure D).

**4.2.4. Production-Linked Incentive (PLI) Scheme:** The PLI scheme, introduced in 2021, aims to incentivize domestic manufacturing of defence and aerospace components by offering financial incentives based on production volumes and value addition. More than 63% of the experts opine positively to the scheme, wherein, they either consider it adequate in present form or with some improvements (Annexure D).

**4.2.5. Strategic Partnership Model (SPM):** The SPM allows private Indian firms to form long-term partnerships with foreign original equipment manufacturers (OEMs) for manufacturing fighter jets, submarines, helicopters, armoured vehicles, etc. More than 50% of the experts opine positively to the scheme, wherein, they either consider it adequate in present form or with some improvements (Annexure D).

**4.2.6. Defence Industrial Corridors (DICs):** India has established two Defence Industrial Corridors in Uttar Pradesh and Tamil Nadu to create a dedicated ecosystem for defence manufacturing. These corridors aim to; promote private sector investments, facilitate technology collaborations, generate employment and contribute towards skill development. Nearly 95% of the experts opine positively to the scheme, wherein, they either consider it adequate in present form or with some improvements (Annexure D).

**4.2.7. Conversion of Ordnance Factories into DPSUs:** The Ordnance Factory Board (OFB) was corporatized into seven DPSUs to improve efficiency, accountability and market competitiveness. This reform is expected to; increase productivity & accountability, financial autonomy and enhance export potential by adopting corporate governance standards. 50% of the experts consider that some improvements are still needed. More than 55% experts believe that the DPSUs need to be privatised (Annexure D).

**4.2.8. Indigenous Content (IC) and Self-Reliance:** Minimum indigenous content requirement has been increased from 40% to 50% in various procurement categories and preference has been given to Indian vendors under the Buy (Indian– Indigenously Designed, Developed and Manufactured (IDDM)) and Buy (Indian) categories. There are incentives for domestic development of aero engines, silicon wafer fabs and military-grade software.

**4.2.9. New Procurement Categories:** The new categories are; firstly, Buy (Global – Manufacture in India), which allows foreign Original Equipment

Manufacturers (OEMs) to manufacture in India through technology transfer. Next category is Make-I (Government Funded) where the government supports up to 70% of prototype development costs. The third category is Make-II (Industry Funded), which is open to MSMEs and startups without government funding. Finally, Make-III, is primarily import substitution strategy for sustaining existing weapon systems.

**4.2.10. Fast-Track Procurement (FTP):** DAP introduces single-stage approvals for capital acquisition up to ₹5 billion to speed up urgent defence procurements.

**4.2.11. Project Management Unit (PMU):** A dedicated PMU established to monitor acquisition projects and ensure time-bound procurement.

**4.2.12. Long-Term Integrated Capability Development Plan (ICDP):** Replaces the earlier 15-year Long Term Integrated Perspective Plan (LTIPP) with a 10-year ICDP, aligning it with the five-year Defence Capability Development Plan (DCAP).

**4.2.13. Streamlined Trial and Testing Procedures:** Emphasis on objective, technology-driven assessments. Trials are conducted in shorter timelines to minimize acquisition delays.

**4.2.14. Defence Procurement Manual (DPM) 2009:** Serves as a key regulatory framework to streamline defence acquisitions, enhance transparency, and improve efficiency in procurement processes. The manual establishes principles, policies and procedural guidelines for procurement under the revenue budget and outlines the responsibilities of various stakeholders. However, the last amendment to the document was done in 2015 and is now more than a decade old and precedes the Make in India initiative and Atmanirbhar Abhiyan. As per officers working in the policy formation department of the Headquarters (HQ) of Integrated Defence Staff (IDS), draft DPM 2024 has been sent to the Ministry of Defence in March 2024, which needs to be promulgated at the earliest.

#### **4.3. Government Initiatives under Atmanirbhar Bharat in Defence:**

The Atmanirbhar Bharat initiative in defence seeks to build an independent and globally competitive defence industry. Its key objectives include; reducing India's reliance on foreign arms imports (currently over 50% of total procurement), promoting self-reliance in critical technologies, such as aerospace, missile systems, cyber defence and artificial intelligence, increasing defence exports to become a major player in the global arms market and encouraging private sector participation and partnerships with foreign original equipment manufacturers (OEMs). The major initiatives taken by the government under the Atmanirbhar Bharat initiative including those undertaken under the Make in India initiative and ever before that are given below.

**4.3.1. Empowered Group of Secretaries (EGoS) and the Project Development Cells (PDCs):** The government, has created EGoS and the PDCs with the aim of making India a more investor-friendly destination, further smoothening investment inflows and at the same time bringing synergy amid Ministries and Central/State Governments in investment/incentive policies.

**4.3.2. Positive Indigenization Lists:** The Ministry of Defence till now have announced five Positive Indigenization Lists, banning the import of over 509 defence items, including artillery guns, combat vehicles, radars and missiles, to ensure domestic production. Similarly, a Positive Indigenisation Lists has also been prepared by the DPSUs. However, experts argue that the indigenisation timelines are unrealistic and most Indian firms still rely on foreign technology for critical components such as jet engines, semiconductors, and electronic warfare systems (Annexure D).

**4.3.2. Innovations for Defence Excellence (iDEX):** The iDEX program fosters collaboration between startups, academia and defence PSUs to develop disruptive military technologies. Under the iDEX schemes called “**Acing Development of Innovative Technologies**” (ADITI) scheme, “**Support for Prototype and Research Kickstart in Defence** (SPARK) too was launched in 2024, which focuses on funding startups, MSMEs and innovators in developing defence technologies. Nearly, 58% of the experts consider that some more improvements are needed to make it better (Annexure D).

**4.3.3. Support to MSMEs and Startups:** Special incentives for MSMEs participating in defence tenders have been announced and in the “Make” and “Buy (Indian)” categories prioritize MSME over others and contracts have been reserved for MSMEs (projects below ₹100 crore/year). Further special incentives have been included under the Innovations for Defence Excellence (iDEX) and Technology Development Fund (TDF) for fostering defence innovation. In the **Expert Opinion Survey**, the experts believe that the major concerns revolve around funding, procurement opportunities, policy simplifications and R&D incentives. To make Atmanirbhar Bharat more effective, the government should provide further incentives to the MSMEs.

**4.3.4. National Skill India Mission (NSIM):** This initiative provides training in advanced defence technologies, creating a skilled workforce for private and public defence enterprises. In the public survey a whopping 93% people believe that Indian labour force is trained to take on specialised defence production jobs. However, 87% of the experts feel that the NSIM needs to go a long way in developing the skill levels of Indian labour.

**4.3.5. SRIJAN Indigenisation Portal:** A non-transactional online market place for all Defence Public Sector Undertakings (DPSUs) and the Armed Forces (SHQ) has been created by the government (Sharma, P, 2024) to increase transparency and provide a level playing field to

the private industries including the MSMEs. More than 36,886 (March 2024) items (PIL items included) are available for on the portal & 7,283 items have been indigenized till March 2023.

**4.3.6. Technology Development Fund (TDF):** A Rs 100 crore corpus fund created to enable Indian industries, specially MSMEs, for indigenisation of defence products. The fund may also be utilised for developing new technologies as required by DRDO, Services and DPSUs. Cost of each project under TDF can be up to Rs 10 crore. The industry can get funding up to 90% of the project cost. A total of 27 technologies under 10 projects successfully developed so far.

**4.3.7. DRDO Patents for Indian Industry:** All patents and relevant intellectual publications have been made available on the DRDO website at [www.drdo.gov.in](http://www.drdo.gov.in). These can be used freely by Indian industry. The total number of Intellectual Property Rights (IPR) available with DRDO has increased from 596 in 2014 to 2,765 in 2024. DRDO has handed over 1,600 technologies to private industries till May 2023.

**4.3.8. Development Cum Production Partner (DcPP) Model:** This model has been envisioned for DRDO developed systems. It provides for involvement of the private industries from the beginning of the development cycle. This results in reduction in time-frame of the

development-to-induction cycle. Further no Transfer of Technology (ToT) fees are being charged from DcPPs.

**4.3.9. Labour Laws:** The Essential Defence Services Bill, 2021 was introduced by the Ministry of Defence, to ensure uninterrupted functioning of defence-related industries and services by prohibiting strikes, lockouts and layoffs in units engaged in essential defence services. The bill plays a critical role in India's Atmanirbhar Bharat initiative by ensuring that defence manufacturing and operational readiness are not disrupted by labour strikes or workforce shortages.

**4.3.10. Ease of Doing Business:** Highlights the various initiatives by the government towards Ease of Doing Business by the various agencies specifically for startup ecosystem, by raising capital and reducing compliance burden. The key focus areas of the initiatives are; firstly, simplification of procedures related to applications, renewals, inspections, filing records, etc., secondly, rationalization by repealing, amending or subsuming redundant laws, thirdly, digitization by creating online interfaces eliminating manual forms and records and finally, decriminalization of minor technical or procedural defaults. Major initiative is the National Single Window System (NSWS), which is a one-stop digital platform for investors, entrepreneurs, and businesses to obtain approvals and clearances. Enables Government-to-Business (G2B) clearances by auto-populating forms and avoiding duplication.

**4.3.11. Support to Startups:** The initiatives undertaken by the various government agencies/ ministries include the following;

**4.3.11.2. Regulatory Reforms for Startups by Reserve Bank of India (RBI):** Allowed startups to access loans under the External Commercial Borrowing (ECB) framework up to USD 3 million. Enabled Foreign Venture Capital Investors (FVCI) to invest 100% in Indian startups.

**4.3.11.3. Regulatory Reforms for Startups by Securities and Exchange Board of India (SEBI):** Reduced lock-in period for angel investments from 3 years to 1 year. Allowed Angel Funds to invest in overseas startups up to 25% of their corpus.

**4.3.11.3. Regulatory Reforms for Startups by Ministry of Corporate Affairs (MCA):** Exempted startup private companies from certain compliance requirements. Allowed self-certification for annual returns.

**4.3.11.3. Regulatory Reforms for Startups by Income Tax and Financial Incentives:** Tax exemptions for eligible startups for three consecutive years out of ten years. Capital gains tax exemption on investments into startups.

**4.3.11.3. Regulatory Reforms for Startups by Labour and Employment Reforms:** Allowed EPFO to invest up to 5% of surplus funds in Alternative Investment Funds (AIFs).

**4.3.12. Agnipath Scheme:** The scheme has multifarious aims but with respect to defence manufacturing it ensures that the revenue budget is reduced as far as pension and other benefits are concerned and more funds are available for procurement, which has a direct bearing on money available for the various defence manufacturing entities.

#### **4.4. Evaluation of Policy Effectiveness - A Comparative Perspective:**

India's defence policy framework has evolved significantly, yet its effectiveness is best understood through a comparative analysis with leading defence-industrial nations. The approach followed by China, Israel, South Korea, the USA, and France provides key insights into strengths and gaps in India's policies.

**4.4.1. China – State Controlled Defence Innovation:** China's defence industry is driven by strong state intervention and long-term investments in R&D. The government directly controls major defence companies such as Norinco, AVIC, and CASC, ensuring rapid development of indigenous military technology (Weinbaum. C et.al. 2022). With over 90% self-sufficiency, China has transitioned from an importer to a leading exporter of defence equipment. In contrast, India's self-reliance remains below 50%

(SIPRI, 2023), with limited success in developing indigenous high-end technologies like jet engines and advanced missile systems.

**4.4.2. Israel - Private Sector-Led Innovation:** Israel's defence industry thrives on strong private sector participation, R&D investments, and technology-driven exports. Companies like Rafael, Elbit Systems, and Israel Aerospace Industries (IAI) collaborate closely with academia and startups (Razdan, 2019). Unlike India's PSU-dominated model, Israel incentivizes private players through export-oriented policies, ensuring that over 75% of its defence production is exported (Lappin, 2025). India's defence exports, in comparison, are significantly lower at around ₹21,000 crore (~\$2.5 billion) in 2023.

**4.4.3. South Korea - Technology Transfer & Local Production:** South Korea's model emphasizes technology transfers from global defence majors and indigenous production under companies like Hanwha, LIG Nex1, and KAI. Through policies like offset obligations and joint ventures, South Korea ensures 80% indigenization in key defence projects (Manage. A, 2023). While India has introduced Positive Indigenization Lists, its implementation remains inconsistent, and key systems (e.g., jet engines, semiconductors) still rely on foreign imports.

**4.4.4. USA -: Defence-Industrial Complex & R&D Focus:** The USA leads the global defence industry due to strong industry-academia collaboration, advanced R&D funding, and global defence exports. DARPA (Defense

Advanced Research Projects Agency) plays a critical role in cutting-edge innovation, enabling technologies like stealth aircraft, GPS, and autonomous systems (Congressional Research Service, 2023). India's iDEX and TDF initiatives are inspired by DARPA but operate on a much smaller scale, with limited funding for R&D.

**4.4.5. France - Public-Private Partnership & Export Focus:** France's integrated approach ensures seamless collaboration between state-owned firms (Dassault, Naval Group) and private players (Thales, Safran). Over 40% of its defence budget is allocated to R&D, ensuring long-term innovation (French Defence Budget Report, 2023). India's R&D allocation in defence remains at 6% of the total budget, limiting innovation potential.

**4.4.6. Key Takeaways from Global Models:**

5.4.6.1. China's success lies in state-driven R&D investment, ensuring rapid development of indigenous technologies.

5.4.6.2. Israel's strength comes from a tech-driven, export-oriented model, integrating startups into defence innovation.

5.4.6.3. South Korea's efficiency is due to technology transfer, local manufacturing and offset obligations.

5.4.6.4. USA's model highlights the importance of defence R&D institutions like DARPA and industry collaboration.

5.4.6.5. France ensures stability through a balanced public-private defence ecosystem and export-oriented policies.

#### **4.5. Challenges in Policy Implementation:**

As seen from the foregoing paragraphs, India has made notable progress in shaping a comprehensive defence industrial policy, the effectiveness of these policies in achieving self-reliance and global competitiveness requires stakeholder evaluation. Several key policy gaps have been identified through comparative analysis with China, Israel, South Korea, the USA and France, that highlight structural inefficiencies, bureaucratic challenges and slow private sector integration.

##### **4.5.1. Bureaucratic Hurdles & Policy Implementation Delays:**

4.5.1.1. Defence procurement in India remains slow, despite Defence Acquisition Procedure (DAP) 2020 introducing reforms.

4.5.1.2. Delays in contract execution and policy implementation hinder private sector confidence.

4.5.1.3. Countries like Israel and South Korea have rapid procurement cycles, making their domestic firms globally competitive.

4.5.1.4. Offset policy removal for G2G deals is likely to reduce India's attractiveness for technology transfers.

#### **4.5.2. Insufficient R&D Investments:**

4.5.2.1. India's defence R&D expenditure remains low (0.9% of GDP).

4.5.2.2. China, the USA, and France allocate a much larger share to R&D, ensuring cutting-edge technological advancements.

4.5.2.3. Limited collaboration between DRDO, private firms and academia slows the pace of innovation.

4.5.2.4. The Technology Development Fund (TDF) and iDEX initiatives need greater funding and wider industry participation.

#### **4.5.3. Limited Private Sector Engagement:**

4.5.3.1. FDI in defence was raised to 74% (automatic route), yet global firms remain hesitant due to policy uncertainty and corruption.

4.5.3.2. Private defence companies in India struggle to secure large-scale contracts against DPSUs.

4.5.3.3. The Strategic Partnership Model (SPM) has yet to deliver significant joint ventures in fighter jets, submarines, or missile systems.

4.5.3.4. South Korea and France have successfully integrated private players into their defence ecosystem, leading to high export volumes.

4.5.3.5. Indian private players face capital constraints, lack of clear procurement pathways, and uncertain policy execution.

#### **4.5.4. Import Dependence on Critical Technologies:**

4.5.4.1. High reliance on foreign firms for fighter jet engines, radars, avionics, and electronic warfare systems.

4.5.4.2. Lack of domestic semiconductor and chip manufacturing capabilities.

#### **4.5.5. Weak Defence Export Capabilities:**

4.5.5.1. India's defence exports (\$2.5 billion) remain significantly lower than Israel (\$12 billion) and South Korea (\$17 billion).

4.5.5.2. Involvement of Defence Attaches and export facilitation efforts need expansion.

4.5.5.3. The USA and France leverage defence exports as a diplomatic tool, something India has yet to implement effectively.

#### **4.5.6. Skill Development Deficiencies:**

4.5.6.1. The National Skill India Mission needs more targeted training for defence-specific manufacturing skills.

4.5.6.2. Lack of specialized workforce in AI, cyber warfare and avionics engineering.

#### **4.5.7. Policy Fragmentation & Regulatory Hurdles:**

4.5.7.1. Frequent amendments to policies such as FDI limits, offset clauses, and procurement guidelines create instability.

4.5.7.2. Slow approvals for licences and production partnerships affect investor confidence.

4.5.7.3. China's centralised decision-making process has facilitated rapid military-industrial development.

#### **4.6. Conclusion:**

India's defence policy framework has seen significant progress through DAP 2020, DPEPP 2020, FDI reforms, and Atmanirbhar Bharat initiatives. However, global comparisons highlight gaps in R&D funding, private sector participation, and export-oriented strategies. By increasing defence R&D, incentivizing private players, expanding export reach, and strengthening policy execution, India can achieve its goal of self-reliance in defence production and emerge as a global defence exporter.

## **CHAPTER 5**

### **INDIAN AND GLOBAL DEFENCE MODELS**

#### **5.1. Introduction:**

The defence industry is crucial for a country's strategic independence, military preparedness and economic growth. Nations with well-developed and autonomous defence industries minimize reliance on foreign suppliers by ensuring that critical military technologies remain under their control. With the Atmanirbhar Bharat initiative, India has embarked on a path toward achieving self-reliance in defence production while also positioning itself as a leading global exporter. To achieve this, it is essential to study successful international models and their growth trajectories. Analysis of the leading defence manufacturing nations provides valuable insights into the best practices, industrial policies and export-oriented strategies that have strengthened their military-industrial complexes.

China has implemented a state-directed, technology-acquisition-based model, transforming itself from a major arms importer to one of the largest arms manufacturers globally (RAND Corporation, 2023). Israel, despite its small size, has built a highly innovative, export-oriented defence industry by leveraging cutting-edge technology, fostering private sector participation and securing strong government support. South Korea has achieved self-reliance through targeted policy interventions, strategic technology transfers, and robust state-industry collaboration.

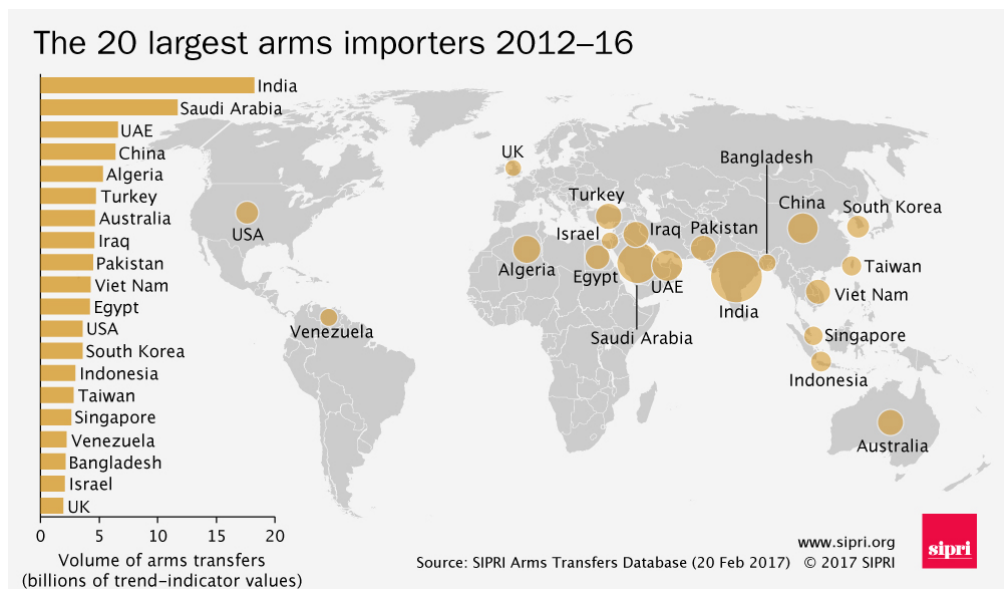
On the other hand, the United States follows a private sector-driven, research-intensive approach, dominated by major defence corporations such as Lockheed Martin and Boeing, with critical support from government agencies like the Defence Advanced Research Projects Agency (DARPA). France, on the other hand, has successfully implemented a balanced and hybrid model that integrates both state oversight and private sector efficiency, positioning itself as a global leader in advanced military exports. Russia has not been considered in the study primarily since its model is similar to that of China, however, the Chinese have grown manifold in the last two decades and therefore are more relevant to be studied in the contemporary times.

This chapter studies the defence models of China, Isreal, South Korea, USA and France to understand the diverse approaches to defence self-reliance and industrial growth employed by these countries, and to derive key takeaways for India to achieve success in its desire to achieving self-reliance and also becoming a major defence exporter.

## **5.2. China's Defence Industrial Model:**

**5.2.1. Overview and Evolution:** China's rapid transformation from an import-dependent arms consumer to one of the world's largest military-industrial powerhouses is a testament to state-driven policies, long-term strategic investments, and aggressive technology acquisition (RAND Corporation, 2022). Initially, China's defence industry was heavily reliant on Soviet military technology, with early efforts focused on reverse engineering

of imported systems (Cheung, 2023). However, following their split in the 1960s, China began significant reforms and restructured its defence enterprises, invested in R&D and pursued foreign technology through both legal and illegal means (Bitzinger, 2021). The **Figure 5.1** indicates that China was the fourth largest importer of arms between 2012-16. However, by 2021, China had five of the top ten global defence firms, including, China North Industries Group Corporation (NORINCO), Aviation Industry Corporation of China (AVIC) and China State Shipbuilding Corporation (CSSC) (RAND Corporation, 2022). This transformation allowed China to reduce its arms imports to below 10% of its total defence procurement, while increasing its global market share in military exports (SIPRI, 2022).



**Figure 5.1: 20 Largest Importers in the World (2012-16)**

(Source: SIPRI Arms Transfers Database Mar 2024)

## **5.2.2. Key Features of Chinese Model:**

**5.2.2.1. State Owned Enterprises (SOEs):** China's defence industry is dominated by state-owned enterprises, which control major segments like aerospace, shipbuilding, armoured vehicles and missile development (Bitzinger, 2021). These SOEs operate under the guidance of the State Administration for Science, Technology, and Industry for National Defence (SASTIND) and receive direct government subsidies and policy support. Chinese government tightly controls defence procurement, R&D and exports. The five major SOEs are; Aviation Industry Corporation of China (AICC) which specialises in military aircraft and UAVs, China North Industries Group Corporation (NORINCO) which specialises in land systems and munitions, China State Shipbuilding Corporation (CSSC) that specialises in naval platforms, China Electronics Technology Group (CETC) specialises in electronic warfare, cyber capabilities and China Aerospace Science and Technology Corporation (CASC) which specialises in missiles and space technologies.

**5.2.2.2. Military-Civil Fusion (MCF):** A major pillar of China's defence modernization strategy is MCF, a policy aimed at integrating civilian industries, private technology firms and research institutions with the defence sector (Saunders & Wuthnow, 2017). This strategy enables seamless transfer of dual-use technologies, particularly in high end technologies like, AI, cyber warfare, quantum

computing etc. Chinese tech giants like Huawei, Tencent and DJI have actively contributed to MCF (Kania, 2020).

**5.2.2.3. Technology Acquisition:** China has pursued aggressive technology acquisition strategies, leveraging espionage, cyber theft, technology transfers and joint ventures to acquire cutting-edge military technology (Bitzinger, 2021). The J-20 stealth fighter and HQ-9 missile systems are examples of how China reverse-engineered US and Russian platforms to develop indigenous alternatives (RAND Corporation, 2022). Additionally, China has purchased and modified foreign platforms such as the Soviet Su-27, which led to the development of the J-11, etc. Even the Chinese stealth fighter the ‘Shenyang J-35’ has lot of similarity to the American ‘F-35’.

**5.2.2.4. Joint Ventures:** China also uses commercial joint ventures with Western firms to gain access to critical technologies. For example, collaborations in aerospace and satellite technology with European and US firms have provided Chinese defence companies with access to materials and design expertise, accelerating the development of advanced combat aircraft (Bitzinger, 2022).

**5.2.3. Self-Reliance Initiatives:** China has successfully indigenized several critical weapon systems, reducing its reliance on imports. Some of its notable developments include; J-20 Stealth Fighter, DF-17 Hypersonic Missile, Y-20 Transport Aircraft and the aircraft carriers, viz, Liaoning (Type 001),

Shandong (Type 002) and Fujian (Type 003). Despite these successes, China still faces challenges in aircraft engine development and high-end semiconductor production, two critical areas where it continues to depend on imports from Russia and Western nations (RAND Corporation, 2022).

**5.2.4. Defence Exports and Global Market Presence:** China has emerged as the fourth-largest arms exporter in the world, and Pakistan, Bangladesh and African nations are its primary clients (SIPRI, 2021). China's competitive advantage lies in offering cost-effective alternatives to Western and Russian military hardware, often with flexible financing options and fewer political restrictions (The Asia Live News Service, 2024).

### **5.3. Israel's Defence Industrial Model:**

**5.3.1 Overview and Evolution:** Israel's defence industry is one of the most advanced and export-driven models, built on a foundation of strong government support, high-tech innovation and private sector leadership (Razdan, D, 2019). Israel has fostered a robust private defence sector, led by companies such as Israel Aerospace Industries (IAI), Rafael Advanced Defence Systems and Elbit Systems. These firms have developed world-class technologies in missile defence, unmanned aerial vehicles (UAVs), cyber warfare and electronic warfare systems. The Directorate of Defence Research & Development (DDR&D), under the Ministry of Defence (MoD), leads indigenous R&D. Israel's defence industrialization was necessitated by regional security threats and arms embargoes, particularly after the 1967 Six-

Day War. Israel adopted a self-reliance strategy, focusing on domestic innovation, military-civil fusion and strategic alliances (Lappin, Y, 2025). This has enabled Israel to develop cutting-edge indigenous technologies while also securing extensive military aid from the United States.

### **5.3.2. Key Features of Israel's Defence Industry:**

#### **5.3.2.1. Innovation-Driven R&D and Dual-Use Technologies:**

The defining feature of Israel's defence model is its emphasis on military innovation and dual-use technologies (Even, S. 2015). The country invests heavily in R&D, spending approximately 4.5% of its GDP on research which is one of the highest in the world (World Bank, 2022). This investment has led to breakthroughs in UAV technology, missile defence and AI-driven surveillance systems. Israel's Iron Dome missile defence system is a prime example of its innovation prowess.

#### **5.3.2.2. Strong Private Sector Participation:**

Israel's defence sector is led by private firms, wherein, companies like, Elbit Systems and Rafael develop and market advanced weaponry worldwide, competing with global defence giants (Even, S. 2015). This private sector-led approach ensures efficiency, cost-effectiveness and rapid innovation cycles.

**5.3.2.3. Export-Oriented Strategy:** For a small country, Israel is a major global defence exporter, with defence exports reaching \$11.3 billion in 2021, accounting for 8% of global arms sales (SIPRI, 2022). Israel derives over 75% of its defence revenue from exports. Key clients include India, the USA and NATO partners (Kumar, 2021), with primary exports in missile systems, radar technology, drones and cyber systems.

#### **5.4. South Korean Defence Industry:**

**5.4.1. Overview and Evolution:** South Korea's defence industry is state-led, export-driven, heavily focused on technology transfer agreements and relies on private sector integration. (Manage G. 2023). The country initially relied on American aid and support, but, has since developed a strong domestic arms industry through state investment and private sector collaboration. The Defence Acquisition Program Administration (DAPA) governs procurement and industrial development, driving initiatives such as; the Korean Fighter Program (KF-X), self-propelled artillery (K9 Thunder) and the next-generation naval platforms.

#### **5.4.2. Key Features:**

**5.4.2.1. State-Driven Defence Policy and Technology Transfer:** The Defence Acquisition Program Administration (DAPA) oversees South Korea's defence procurement and industrial strategy,

ensuring technology transfer agreements are embedded in major foreign military deals (Manage G. 2023). For example, South Korea acquired F-35 fighter jets with agreements to transfer of technology on the stealth and avionics (Ranjan, A. 2023).

**5.4.2.2. Global Partnerships and Defence Exports:** South Korea has become a major arms exporter, with defence sales reaching \$7.3 billion in 2022. South Korea has rapidly expanded defence exports, with Poland, Indonesia, and United Arab Emirates (UAE) among top buyers (Ranjan, A. 2023). The K9 Thunder self-propelled howitzer, developed by Hanwha Defence, is exported to Turkey, Finland, Poland and India (SIPRI, 2023).

## **5.5. US Defence Industry:**

**5.5.1 Overview and Evolution:** The United States has the largest and most advanced defence industrial base globally, driven by a strong private sector, robust government support and continuous investments in cutting-edge military technologies. The US Department of Defence (DOD) plays a central role in shaping the defence industry through policy frameworks, funding mechanisms and procurement strategies. Unlike India, where DPSUs dominate defence production, the U.S. relies on large private defence contractors and extensive R&D collaborations with universities and technology firms. Companies like Lockheed Martin, Boeing, Northrop Grumman and Raytheon lead the global arms market, supported by Defence Advanced Research

Projects Agency (DARPA) (Congressional Research Service, 2023). Some of its landmark contributions include; stealth aircraft technology (F-117 Nighthawk, B-2 Spirit), Global Positioning System (GPS), Advanced Research Projects Agency Network (ARPANET) which was the first version on the present-day internet technology, Unmanned Aerial Vehicles (UAVs) and hypersonic missiles.

### **5.5.2. Key Features of the US Defence Industry:**

#### **5.5.2.1. Private Sector Leadership and Industry-Academia**

**Collaboration:** Unlike state-led models, the US defence sector is driven by private companies and universities (U.S. Industrial Base Report, 2023). DARPA plays a crucial role in funding disruptive technologies such as stealth aircraft, hypersonic missiles, and AI-based warfare systems.

**5.5.2.2. Strong Defence Exports:** The US is the world's largest arms exporter, controlling 39% of global arms sales. It supplies advanced military platforms such as F-35 fighter jets, Patriot missile systems and MQ-9 Reaper drones to allies like India, Japan and NATO countries (SIPRI, 2022).

## **5.6. Franch Defence Industry:**

**5.6.1. Overview and Evolution:** France has developed a highly advanced and self-sufficient defence industry, balancing indigenous military production with a strong export-oriented strategy. France maintains state-backed defence manufacturers, ensuring strategic autonomy and the French defence sector is heavily supported by government funding (France Defense Industry Report, 2023). The defence ecosystem is dominated by a mix of state-controlled and private firms, including; Dassault Aviation which is the manufacturer of the Rafale fighter jets, Naval Group that specialises in nuclear submarines, aircraft carriers and warships, the Thales Group which develops radar, electronic warfare and avionics systems and Safran which is a leader in jet engines, propulsion systems and missile guidance technologies (France Defense Industry Report, 2023).

### **5.6.2. Key Features:**

**5.6.2.1. State-Backed Private Industry:** France balances government oversight with private innovation, ensuring indigenous production of all major platforms including Rafale fighter jets, Barracuda-class submarines, etc (France Defense Industry Report, 2023).

**5.6.2.2. Strong Export Strategy:** France is the third-largest arms exporter in the world, supplying India, Egypt (SIPRI, 2022).

### 5.7. Comparison of Defence Industrial Capabilities of India with other

**Countries:** The table below gives out the comparison of the capabilities of the countries discussed above;

Category	India	China	Israel	S Korea	USA	France
<b>Defence Budget (% of GDP)</b>	2.0%	1.7%	5.2%	2.8%	3.5%	2.1%
<b>R&amp;D Investment</b>	6% of defence budget	High 15% of defence budget	10% of defence budget	10% of defence budget	20% of defence budget	15% of defence budget
<b>Indigenization Level</b>	Heavy dependency on imports	High; reverse engineering indigenous production	Very High; exports account for significant share	Moderate; emphasis on domestic capabilities	Very High; top global arms exporter	High; strong indigenous defence production
<b>Private Sector Role</b>	Emerging, but dominated by public sector	Strong state-owned enterprises; controlled private participation	Private sector-driven, strong SME presence	Public-private collaboration; strong private industry	Private sector dominant	Balanced public-private model
<b>Technology Transfer Initiatives</b>	Offsets Policy, FDI Cap of 74%	Strong focus on technology transfer via JV	Technology spin-offs from military R&D	Offsets & domestic development programs	Strong international alliances & co-production	Joint development projects, EU defence integration
<b>Defence Industrial Base Maturity</b>	Developing ; reliant on foreign technology	Mature; integrated with civil-military sectors	Highly advanced; strong dual-use innovation	Evolving; increasing exports & domestic production	Mature; world's most advanced defence industry	Mature; strong global supplier

**Table 5.1: Comparison of Defence Industrial Capabilities**

(Source: Compiled from the study above)

## **5.8. Key Takeaways for India:**

### **5.8.1. Lessons from China:**

5.8.1.1. State-driven policies with long-term strategic goals enhance defence self-reliance.

5.8.1.2. Military-Civil Fusion (MCF) enables rapid integration of civilian technology into military applications.

5.8.1.3. Strategic technology acquisition and reverse engineering can accelerate domestic capabilities.

5.8.1.4. Focused R&D investments in critical areas like hypersonic technology, cyber warfare and AI are crucial for future warfare.

### **5.8.2. Lessons from Israel:**

5.8.2.1. Encouraging private-sector leadership in defence R&D.

5.8.2.2. Focusing on high-tech areas such as AI, cyber warfare and missile defence.

5.8.2.3. Developing an export-oriented approach to sustain long-term growth.

**5.8.3. Lessons from South Korea:**

5.8.3.1. Enhancing defence exports through global partnerships.

5.8.3.2. Mandating technology transfer in foreign procurement deals.

5.8.3.3. Strengthening state support for private sector-led defence innovation.

**5.8.4. Lessons from USA:**

5.8.4.1. Strengthen private-sector participation in defence manufacturing.

5.8.4.2. Increase defence R&D spending, modelled after DARPA.

5.8.4.3. Strengthening industry-academia collaboration.

### **5.8.5. Lessons from France:**

5.8.5.1. Combining state and private sector strengths in defence manufacturing.

5.8.5.2. Developing a robust defence export policy.

5.8.5.3. Investing in next-generation platforms for strategic advantage.

### **5.9. Conclusion:**

A comparative analysis of global defence models reveals diverse approaches to defence self-reliance and industrial growth. While China and South Korea rely on strong state intervention and technology transfers, Israel and the USA emphasize private-sector innovation. France presents a balanced model, integrating state oversight with private efficiency. India's defence industrial strategy must balance public sector modernization, private sector integration and R&D investment to achieve self-reliance and global competitiveness. By adapting best practices from leading defence economies, India can enhance domestic capabilities, reduce import dependency and expand defence exports under Atmanirbhar Bharat.

## **CHAPTER 6**

### **PUBLIC AND EXPERT OPINIONS ON ATMANIRBHAR BHARAT**

#### **6.1. Introduction:**

Understanding stakeholder perspectives help policymakers refine policies, address bottlenecks and ensure that reforms lead to tangible outcomes. Further, the success of any major policy initiative depends not only on its formulation but also on its perception and reception by stakeholders. Therefore, perceptions of the public dealing with or directly affected by the policy and more importantly opinions, suggestions and recommendations of the experts in that particular field is important feedback on the effectiveness and relevance of the policy/ policies. This chapter analyses the government policies and initiatives undertaken under the Atmanirbhar Bharat initiative and compares it the perceptions of the public working in the field in the form of a survey obtained through a questionnaire using the Google form. The chapter further seeks opinion of the experts in the subject through the means of semi-structured questions administered in the form of Google form. The chapter seeks the inputs and recommendations from the public survey and the expert opinion on all policy matters and government initiatives under the Atmanirbhar Bharat initiative.

#### **6.2. Public Survey:**

**6.2.1. Methodology:** The survey was conducted through the medium of a multiple-choice questionnaire created on the Google Forms, which was

circulated through the social media platforms. The Questionnaire titled **“Assessing the Effectiveness of Atmanirbhar Bharat in Defence Self-Reliance: Questionnaire”** is attached as **“Annexure A”** to the dissertation. The survey targeted defence enthusiasts, professionals and general respondents dealing with the subject to gauge their awareness and perception of Atmanirbhar Bharat and the various common knowledge issues related to it.

**6.2.2. Sample Size and Type:** In all, 127 personnel responded to the questionnaire. The compiled response to the questionnaire titled **“Assessing the Effectiveness of Atmanirbhar Bharat in Defence Self-Reliance: Public Response”** is attached as **“Annexure B”** to the dissertation. More than 66% of the respondents are over 51 years old, 74% are post-graduates and above and 79% have more than 20 years of experience in the field. More than 95% of them belong to the armed forces and other are from Defence Industry (DPSU, Private, MSME), researcher/academia and government officials and have varied experience dealing with subjects like Aerospace and Aviation, Naval Systems, Armaments & Artillery, Cybersecurity & Electronic Warfare, Research & Development (R&D) and Manufacturing & Production.

### **6.3. Key Findings form Public Survey:**

**6.3.1. General Perception and Awareness of Atmanirbhar Bharat:** People are well aware of the initiative with 92% responding positively. 78% of believe that the initiative will have a positive impact on achieving self-

reliance in defence manufacturing and 85% believe that it strengthens national security.

**6.3.2. Effectiveness of Government Policies:** 75% respondents view the Defence Acquisition Procedure (DAP 2020) as effective, but 25% cite implementation issues. 83% acknowledge the potential of Defence Production & Export Promotion Policy (DPEPP 2020) in improving defence exports, while 17% believe it to be ineffective in its present form. 88% believe that the positive indigenisation list will effectively reduce import dependency. These figures indicate that the public confidence in policy measures by the government is high. However, the gap between policy intent and execution (DAP & DPEPP) remains a concern and there is a need to address the bottlenecks for sustained success.

**6.3.3. Private Sector:** 79% feel that the role of the Private Sector and its participation has increased, but 21% feel DPSUs still dominate the defence manufacturing sector. 70% believe that the ease of doing business has increased, but 30% believe bureaucratic hurdles as a major impediment. 77% believe that the Strategic Partnership Model is very effective, while 23% seek more transparency and speed in implementation of policies. The figures point towards importance of the role of private players, but DPSU influence remains a challenge as also the bureaucratic red tape which is restricting a full-scale private sector transformation.

**6.3.4. FDI:** 79% of respondents believe that increasing the FDI limit to 74% is beneficial, however, the balance 21% see it as a security challenge. 69%

believe that it will have a positive effect on the technological enhancement for Indian industries, while 31% believe it will have a negative effect as the foreign firms will dominate the market.

**6.3.5. Challenges:** Bureaucratic inefficiency is the biggest challenge (84% respondents). 82% believe that dependency on foreign technology is very high despite efforts towards self-reliance. 78% believe that R&D funding are too short and 79% believe that the transfer of technology is too slow or negligible, indicating a gap between the policy and execution. Limited private sector involvement (74% respondents) suggests that while participation is growing, more reforms are needed to ensure a level playing field with DPSUs.

**6.3.6. Recommendations:** 90% respondent believe that increasing R&D investment is the top priority, reinforcing concerns about funding shortages. Simplifying procurement policies (85%) and regulatory ease (78%) reflect dissatisfaction in the procedures and the bureaucratic inefficiencies. 82% believe that the MSMEs require more support, highlighting their critical role in Atmanirbhar Bharat.

**6.3.7. Key Takeaways:** Speeding up execution, reducing bureaucracy and ensuring transparent policy rollout are a must to bridge the gap between policy and implementation. There is a need to boost R&D and enhancing private sector participation by creating a level playing field for them by reducing DPSU control.

#### **6.4. Expert Opinion:**

**6.4.1. Methodology:** A semiformal interview questionnaire was prepared for seeking the opinion of the experts. However, since the experts are spread all over the country and also keeping their availability and willingness to share opinions, created a major doubt, instead of interview their opinion was sought in the form of an open and short answer format Google Form, which also provided them anonymity, if desired. The same was forwarded to concerned expert as an email or on WhatsApp. Further, it was felt that response from many experts was always better than interviews of a limited number of them and with Google Forms it was easier to compile and analyse large number of responses. The interview questionnaire titled “**Atmanirbhar Bharat: Expert Interview Questionnaire**” is attached as “**Annexure C**” to the dissertation.

**6.4.2. Sample Size and Type:** In all 57 experts responded to the interview questions and their compiled responses titled “**Atmanirbhar Bharat: Experts Opinion**” is attached as “**Annexure D**” to the dissertation. 73% of the respondents are serving armed forces personnel who are intricately involved in the subject including in procurement, policy making, etc. 19% are retired armed forces personnel now working in private industries in the defence manufacturing sector. The balance experts are government officials working in MoD, DRDO, DPSU etc, and executives from the private defence industry. More than 96% of the respondents have been dealing with the subject for more than 20 years. The respondents are a good mix of personnel dealing with the important fields of defence including, Aerospace & Aviation, Naval Systems,

Armaments & Artillery, Cybersecurity & Electronic Warfare, Policy and Governance, Defence Research & Development, Defence Manufacturing & Production.

## **6.5. Key Findings form Expert Opinion:**

**6.5.1. General Perception of Atmanirbhar Bharat:** 66% of the experts believe the initiative and Indias progress towards self-reliance to be effective, while only 3% considered it totally ineffective and the balance being moderately positive. 73% rated the increased participation of the private industry as one of the most significant achievements of the initiative, while, 61% considered increased domestic defence production as important and 49% believed it was increased defence exports.

**6.5.2. DAP 2020:** More than 84% of the experts considered the DAP positively, however, they believed many challenges still exists. The detailed recommendations have been given in the next chapter. However, experts strongly advocate for moving away from the lowest-cost selection method and prioritizing technology-based procurement, ie, from L1 to L1T1 method. They are recommending streamlined decision-making and a reduction in bureaucratic red tape and believe that greater involvement of private companies including MSMEs is essential for innovation and cost efficiency. Strengthening oversight mechanisms is a must to ensure better quality control, accountability and timely deliveries.

**6.5.3. DPEPP:** More than 84% experts feel positively about the DPEPP, however, most of them desire improvements for it to be effective as a tool to increase export and production. The detailed recommendations have been given in the next chapter. However, some of the important ones are; firstly, simplification of licensing & regulatory Frameworks to enable ease of doing business, secondly, increase financial incentives for R&D and exports to foster indigenous research and global competitiveness, thirdly, strengthening certification and Quality Assurance for better oversight, fourthly, the DPEPP 2020 is still in draft form which need to be implemented earliest following multi-stakeholder consultations.

**6.5.4. Positive Indigenisation List:** Nearly 60% of the experts have raised concerns about the list. The experts feel that more critical components should be added to the list rather than just large platforms. Further, the rapid shift to localization lacks a structured roadmap, leading to production delays. While indigenization is crucial, realistic timelines and strategic planning are needed. Experts stress that Atmanirbhar Bharat initiative must be complemented by global collaborations to ensure high-quality production and avoid domestic bottlenecks.

**6.5.5. Private Sector & MSME Participation:** 58% experts feel that government has taken adequate steps to integrate the MSMEs, while 21% believe that partial improvements are required whereas balance 21% feel that much more needs to be done. Experts have emphasised the need for fair competition between DPSUs & private players and that the DPSUs should not

be allowed to monopolise the industry. Despite policy support, private firms still struggle to compete with DPSUs. Experts emphasize the need for a more market-driven approach, better funding access and clear procurement policies to boost private-sector confidence.

**6.5.6. FDI:** 49% experts feel that the present limit of 74% FDI is adequate. Experts stress that FDI should be tied to mandatory technology transfer and that FDI should attract capital, but more importantly it should be able to attract critical technology for self-reliance. Further, the experts believe that while FDI is necessary, but India should not become overly dependent on foreign firms. We require stronger policy safeguards ensure FDI benefits domestic firms rather than sidelining them.

**6.5.7. DICs:** More than 52% have called it the right decision and 42% believe that some improvements would make it even better. Experts are recommending better infrastructure & logistics for defence clusters and call for better roads, testing centres and logistics hubs to improve production. Experts suggest that industry-specific clusters should be established within DICs for specialization and they should have dedicated R&D zones for defence startups and MSMEs. They believe that India should develop DICs into global defence export hubs.

**6.5.8. OFs and DPSUs:** 21% experts feel that the conversion of OFs to DPSUs is the right decision, while, a whopping 50% believe that more need to be done to make them effective. More than 55% believe that the DPSUs also

need to be privatised to make them more responsive and effective. Further, they recommend a shift toward a performance-driven competitive environment for achieving self-reliance.

**6.5.9. Challenges in Defence Exports:** More than 75% experts believe that dependence on foreign suppliers for critical technologies is one of the major impediments, while, 71% believe that slow procurement and bureaucratic delay as one of the major challenges and 70% attribute insufficient investment in defence R&D as one of the primary challenges. Some of the key challenges are; lack of global certification & quality benchmarking, lengthy approval procedures that hinder India's ability to export defence equipment quickly, Indian products remain expensive compared to global competitors and limited market access & weak international positioning.

**6.5.10. Skill Development:** Only 12% of the experts feel that the skill level imparted by the National Skill India Mission for the defence industry work force is adequate to meet requisite standards towards self-reliance. Balance experts feel the need for partial and major overhaul. They believe that closer integration between academia and industry is essential for imparting the requisite defence skills, also the skill development should align with future defence needs and focus on emerging technologies. Further, there is a need for hands-on training & real-world exposure by providing apprenticeships, on-the-job training and vocational programs, etc.

**6.5.10. Overall Assessment:** The experts' support for Atmanirbhar Bharat is high, but they insist that execution challenges remain. Procurement, R&D and private sector participation need urgent reforms. Finally, FDI, exports and defence production policies must align with long-term self-reliance goals.

## **6.6. Conclusion:**

The Atmanirbhar Bharat initiative has significantly improved India's defence production capabilities as has been witnessed from the various Ministry of Defence publications, however, gaps in policy execution, procurement delays and limited private sector involvement hinders its full potential. Public support remains strong, though expert opinions emphasize structural inefficiencies that require urgent attention. Learning from China's state-driven model, Israel's R&D focus, South Korea's global partnerships, the USA's industry-academia collaborations and France's private sector integration, India can enhance its self-reliance and achieve its \$5 billion defence export goal earliest, if not, by 2025.

## **CHAPTER 7**

### **RECOMMENDATIONS AND THE WAY AHEAD**

The journey towards defence self-reliance under Atmanirbhar Bharat for India, has seen a significant jump in exports, which reached ₹21,083 crore in FY 2023-24, up 32% year on year. Further, the domestic procurement too has increased as 68% of the defence budget is now allocated to Indian manufacturers. This positive growth have been made possible primarily due to continuous monitoring by the government followed by timely policy interventions and institution of various initiatives under the Atmanirbhar Bharat and other initiatives before that. The public survey and the expert opinion reveals healthy backing for Atmanirbhar Bharat, with 92% of respondents recognising its significance and 81% of experts advocating for policy reforms, including DAP 2020, draft DPEPP 2020, etc. However, major challenges preventing India from achieving self-sufficiency are the bureaucratic inefficiencies, DPSU hegemony, inadequate R&D financing and sluggish technology assimilation.

This chapter highlights all the findings from the previous chapters as also the recommendations given by the experts to provide actionable policy recommendations to strengthen India's defence manufacturing ecosystem, R&D and export potential, which would help India in achieving self-reliance in defence manufacturing and also make it a major defence exporter. For detailed takeaways and recommendations on each and every aspect of the policies and government initiatives please refer to **Annexure D** document which covers the expert opinion on each of the aspects.

## **7.1. Policy Matters:**

**7.1.1. DAP 2020:** The DAP is critical for transforming India's defence procurement system into a more efficient, transparent and technology-driven model. Over the years the government has been very forthcoming in amending the document as and when the necessity was felt. In the present form, some of the recommended changes are;

**7.1.1.1. Transition from Cost-Based (L1) to Technology-Based (L1T1) Procurement Model:** The L1 model, characterised by cost reduction at the expense of quality and technological progress. This approach frequently allocates contracts to the lowest bidder, which may undermine operational efficacy. Transitioning to the L1T1 (lowest cost with best technology) model will facilitate the procurement of advanced defence equipment that satisfies operational criteria while ensuring cost-effectiveness.

**7.1.1.2. Speedy Decision-Making:** Major problem in defence acquisitions is the long and bureaucratic approval procedure, leading to delays in military modernisation. Procurement of any system may require over 5 to 7 years, resulting in not only escalation of the cost, but more often than not, the equipment becomes technologically obsolete. The DAP 2020 must incorporate time-sensitive decision-making processes, especially, for operationally critical equipment,

which will benefit both economically and with the defence preparedness.

**7.1.1.3. Public-Private Partnerships (PPP) and Incentives**

**for MSMEs:** The participation of the private sector in defence manufacturing has risen; however, DPSUs continue to dominate significant contracts, constraining chances for MSMEs and private companies. The PPP model has done wonders in many nationally important initiatives like the passport-seva, GSTN, etc. and it will facilitate the infusion of private experience, innovation and efficiency into defence industry. Furthermore, incentives including tax concessions, improved loan accessibility and direct purchase from MSMEs ought to be augmented. The government ought to implement long-term defence contracts with private enterprises to promote consistent investments in domestic production and to boost their confidence and provide economic sustenance.

**7.1.1.4. Accountability of DPSUs, DRDO and DGQA:**

The DPSUs and the DRDO are integral to India's self-reliance plan; but they have been criticised for project execution delays, budget overruns and insufficient accountability. Numerous significant programs, like, the Tejas fighter plane and Arjun battle tank, have had extended development timeframes. DAP 2020 must implement rigorous performance assessments, milestone-oriented funding and accountability protocols for DPSUs and DRDO. Furthermore, quality

assurance systems like DGQA must guarantee that defence equipment complies with worldwide standards thereby decreasing rejection rates and augmenting reliability.

**7.1.1.5. Policy Support for R&D:** India's spending in defence research and development is very less compared to leading global powers such as the USA, China and Israel. DAP 2020 should have a policy for organised long-term financing for R&D initiatives. Further, the government should augment defence R&D expenditure to a minimum of 2% of GDP and offer multi-year funding assurances for domestic initiatives to foster ongoing innovation. Moreover, private sector involvement in R&D should be encouraged by permitting collaboration with DRDO and DPSUs to co-develop defence technology within an open research environment.

**7.1.1.6. Cyber Security of Defence IT Systems:** As contemporary warfare grows further reliant on cyber capabilities, India's defence procurement policy must emphasise changes in cybersecurity and software security. The DAP 2020 must require the implementation of secure, domestic software in all defence procurements to safeguard critical military information from foreign cyber-attacks.

**7.1.1.7. Strategic Alliances and Joint Ventures:** Almost all significant defence acquisitions in India entail international

OEMs, and the domestic industry is primarily involved in assembling of imported components. To attain genuine self-reliance, India must reformulate its strategic alliances to guarantee that Indian enterprises obtain access to essential defence technologies rather than only manufacturing licenses. Both South Korea and Israel have utilised global collaborations to enhance domestic defence capabilities. The DAP 2020 should stipulate increased domestic production obligations in all joint ventures and enforce technology transfer agreements to diminish India's long-term reliance on foreign defence companies.

**7.1.1.8. Bureaucracy in Procurement:** The existing structure permits procurement files to traverse multiple committees and ministries, resulting in heightened delays and inefficiencies. The DAP 2020 must incorporate structural reforms to minimise superfluous bureaucratic intervention and empower defence professionals, procurement officials and military leaders with greater decision-making authority. Implementing a single-window clearance system for defence contracts can optimise clearances and expedite project execution, guaranteeing that India's armed services obtain the necessary equipment without undue delays.

**7.1.2. DPEPP 2020:** The DPEPP is again a very important policy document which has a direct bearing on both defence production and exports. Some of the important recommendations related to it are given below, however, the common recommendations already covered in DAP are not repeated.

**7.1.2.1. Licensing and Regulatory Framework to Improve**

**Ease of Doing Business:** A primary obstacle to private sector involvement in defence manufacture is the intricate and protracted licensing procedure. Presently, enterprises must traverse various regulatory authorities to secure permissions, resulting in delays and inefficiencies. DPEPP 2020 should implement a consolidated, single-window clearance system for defence manufacturers. This will diminish bureaucratic obstacles, expedite approvals and entice greater private and foreign investments.

**7.1.2.2. Financial Incentives for R&D, Innovation and**

**Exports:** In contrast to global defence giants like the USA, Israel, and South Korea, India does not provide sustained financial backing for defence research and development in the private sector. The DPEPP 2020 aims to enhance funding for research and development programs via production-linked incentives, research grants and tax advantages. Furthermore, India should enhance export financing arrangements to assist indigenous companies in competing in international defence markets. A specialised Defence R&D Innovation Fund, inspired by Israel's defence research framework, might facilitate collaboration among DRDO, academic institutions and private entities to expedite innovation.

**7.1.2.3. Restructuring Certification Bodies:** The Directorate General of Quality Assurance (DGQA) and the Centre for Military Airworthiness & Certification (CEMILAC) are essential in the certification of defence equipment. However, their protracted approval processes and antiquated evaluation methodologies are significant impediments. Numerous Indian defence industries encounter difficulties in obtaining approval for military applications. There is a requirement to reorganise both DGQA and CEMILAC by implementing worldwide best practices for defence certification. This entails the digitisation of certification processes, establishment of stringent approval schedules and the integration of industry best practices for quality assurance.

**7.1.2.4. Technology-Sharing Agreements between DPSUs and Private Industry:** DPSUs continue to dominate the majority of high-value contracts and maintain exclusive access to essential defence technologies. This inhibits private entities from developing domestic competencies and competing in global markets. DPEPP 2020 should require technology-sharing agreements between DPSUs and commercial enterprises, guaranteeing that essential intellectual property and manufacturing proficiency are accessible to a broader military ecosystem. Furthermore, joint ventures between DPSUs and private enterprises should be encouraged to foster a cooperative military manufacturing environment.

**7.1.2.5. Bulk Clearance Mechanisms:** Presently, India's defence export procedure is excessively cumbersome, necessitating numerous levels of clearances for every transaction. Countries such as South Korea and Israel have implemented bulk clearance systems, permitting pre-approved defence companies to export certain equipment without individual clearances. India ought to establish a comparable mechanism under DPEPP 2020, wherein pre-qualified defence exporters obtain a bulk clearance licence for a specified duration. This will markedly diminish delays, enhance global competitiveness and assist India in attaining its defence export objective of \$5 billion in the near future.

### **7.1.3. Positive Indigenisation List:**

**7.1.3.1. Adequacy of the Indigenisation List:** While expanding the list, emphasis should transition from solely incorporating substantial defensive platforms to prioritising essential subcomponents and technologies, including communication systems, missile guidance components and AI-driven defence applications. This would guarantee that indigenisation initiatives target essential technological deficiencies instead of merely substituting foreign imports with assembly-centric localisation.

**7.1.3.2. Confronting Implementation and Quality Issues:** Many experts believe that the existing timescales for completing

indigenisation are impractical, leading to manufacturing delays, technological assimilation and operational difficulties. Experts warn that DPSUs and major private companies may exploit the PIL to limit foreign OEMs without fulfilling their obligations. For indigenisation to be sustainable, robust quality control methods, compliance with delivery timetables and technological demonstration projects with adaptable schedules are essential for facilitating smoother transitions.

**7.1.3.3. Roadmap and Policy Consistency:** While the PIL is a significant advancement towards self-sufficiency, experts believe that it lacks a clearly delineated implementation strategy. A comprehensive research and development and manufacturing strategy must be formulated for each specified item, accompanied by more clarity regarding government procurement obligations to stimulate industry investment. The list must be periodically updated, matched with India's strategic defence requirements and formulated in collaboration with industry partners to guarantee its practical feasibility.

**7.1.4. DICs:** The creation of two DICs is a major boot to Atmanirbhar Bharat initiative. Some of the recommendations relevant to it are;

**7.1.4.1. Financial Incentives:** To enhance private sector engagement, financial incentives including tax concessions, guaranteed procurement and targeted research and development grants should be implemented. Implementing Special Economic Zone (SEZ)-like

advantages within DICs can stimulate foreign direct investment (FDI) in defence manufacturing, whereas export-oriented defence SEZs can facilitate the global expansion of Indian companies. These steps will augment India's competitiveness in global defence markets.

#### **7.1.4.2. Enhancing Infrastructure and Industry-Specific**

**Clusters:** DICs necessitate exceptional infrastructure, logistics and supply chain assistance to achieve global competitiveness. Establishing sector-specific clusters within DICs (e.g., armoured vehicles, AI-driven defence systems, missile technology, etc) will enable enterprises to specialise and exploit synergies. A unified clearance system for approvals will decrease bureaucratic delays and enhance the simplicity of conducting business.

#### **7.1.4.3. Advancing R&D and Dual-Use Technology**

**Development:** Enhanced private sector investment in R&D should be promoted, especially in new materials, artificial intelligence-driven systems and electronic warfare systems. DICs should contain internal R&D departments, promoting collaboration among DRDO, private enterprises and academic institutions. Moreover, an emphasis on dual-use technology (civil-military applications as has been practiced exceptionally by China) will enhance the commercial viability of defence advances, broadening their applicability beyond military contexts.

**7.1.4.4. Integration of MSME and Startup into Defence**

**Supply Chains:** MSMEs and startups need to be effectively included into the defence supply chain via planned mentoring initiatives, engineering certification assistance and decentralised involvement in DIC projects. Minimising MSME reliance on DPSUs will promote autonomous innovation and enhance their contribution to domestic defence production.

**7.1.4.5. Skill Development and Workforce Training:**

Establishing a specialised workforce proficient in next-generation technologies is essential for sustained success. Enhancing academic collaborations for practical training in defence manufacturing and broadening skill development initiatives focused on AI, drone warfare and cybersecurity will prepare India's workforce for future military requirements.

**7.1.5. FDI:** The FDI policy on defence has been amended many a times by the government since its institutionalisation based on the success it has achieved. Some of the important recommendations on FDI in defence are;

**7.1.5.1. Mandatory Technology Transfer (ToT):**

Experts believe that FDI should extend beyond mere cash infusion and must be associated with obligatory ToT. India must guarantee that international investments extend beyond mere assembly operations and actively

foster the development of domestic design, manufacturing and maintenance competencies.

**7.1.5.2. Strengthening Private Sector Participation:** FDI policies must be synchronised with Atmanirbhar Bharat initiative to guarantee that private defence enterprises, MSMEs and startups obtain a larger proportion of contracts, rather than permitting DPSUs to monopolise partnerships with foreign entities. Experts emphasised that a well-designed incentive system might motivate private enterprises to enhance their defence manufacturing capacities while preserving a level competitive environment.

**7.1.5.3. Monitoring of FDI in Defence:** To avert foreign monopolisation and guarantee adherence to indigenisation objectives, experts advocated for the establishment of an autonomous regulatory authority to supervise FDI inflows, manage technology-sharing agreements, and evaluate policy efficacy. Systematic stakeholder engagement with industry leaders, policymakers, and defence specialists must be institutionalised to perpetually enhance FDI policies in accordance with actual outcomes and shifting national security requirements.

**7.1.6. SPM:** This policy has been used by countries like South Korea to boost defence manufacturing. India too needs to use SPM to its fullest. Some of the important recommendations are;

**7.1.6.1. Broaden SPM to Incorporate R&D and**

**Comprehensive ToT:** At present, SPM concentrates predominantly on production; however, experts believe that its scope need to be broadened to encompass domestic research and development. This would guarantee that private enterprises do not merely function as assembly lines for foreign technologies but actively engage in innovation and the development of indigenous designs. A definitive framework for comprehensive ToT must be instituted for essential military systems, guaranteeing India's long-term self-sufficiency in pivotal defence technologies.

**7.1.6.2. Reduce Government Overregulation:**

Excessive governmental oversight in project approvals, pricing and decision-making has impeded the efficacy of SPM. Experts advocate for reducing governmental intrusion and implementing a market-driven strategy, wherein private sector efficiency and competitiveness dictate success. A transparent procurement procedure featuring expedited approvals and diminished bureaucratic obstacles will enable private enterprises to function with enhanced freedom and autonomy.

**7.1.6.3. Increase DRDO Accountability and Industry**

**Collaboration:** Success of SPM relies on effective collaboration among DRDO, private enterprises and DPSUs. Experts highlight the necessity for enhanced accountability mechanisms inside the DRDO,

guaranteeing that initiatives adhere to timelines and achieve the desired technological improvements.

**7.1.7. DPSU Reforms and Efficiency Enhancement:** Some of the important recommendations are;

**7.1.7.1. Strengthening R&D and Innovation:** DPSUs must provide resources to bolster internal R&D to improve domestic capabilities and diminish dependence on imports. Collaboration with academic institutions and corporate entities in contemporary sectors such as artificial intelligence, drone warfare and advanced avionics will expedite innovation.

**7.1.7.2. Enhancing Accountability Through Performance-Based Evaluation:** To enhance governance, DPSU leadership should be afforded autonomy while adhering to stringent performance monitoring standards. In addition, performance-based evaluation framework for DPSUs should be established, integrating grading systems, annual audits and financial responsibility protocols. Rigorous quality control and prompt project delivery systems must be established, accompanied by financial sanctions for delays and non-compliance.

**7.1.7.3. Encouraging Competition and Reducing DPSU Monopoly:** To establish a market-driven defence ecosystem, DPSUs

must compete with private enterprises on an equitable basis instead of depending on government protectionism. Privatisation and Public-Private Partnership (PPP) frameworks can enhance company efficiency while averting monopolisation. Further, explicit disinvestment policies will facilitate the implementation of corporate governance measures and enhance operational efficiency.

**7.1.7.4. Independent Oversight:** DPSUs should operate autonomously under proficient direction, with diminished bureaucratic intrusion from the Ministry of Defence and the Ministry of Finance. Creating autonomous governing entities to supervise procurement and audits will improve transparency, efficiency and strategic decision-making.

**7.1.7.5. Workforce Development and Skill-Based Hiring:** DPSUs must reform recruiting policies, transitioning from a seniority-based model to one centred on technical expertise. Specialised training programs in modern defensive technologies and performance-based compensation schemes will enhance employee motivation, increase efficiency and attract elite talent.

## **7.2. Challenges in Achieving Self-reliance:**

The major issues are; firstly, strengthening global certification and quality standards, secondly, reducing bureaucratic hurdles for faster defence exports, thirdly,

enhancing cost competitiveness through incentives and infrastructure development, fourthly, expanding strategic partnerships for global market penetration and finally, investing in advanced defence technologies for competitive edge have already been discussed in this chapter earlier. Therefore, they are not being repeated.

### **7.3. Role of Private Sector and MSMEs:**

**7.3.1. Measures to Boost Private-sector Participation:** The important aspect of creating a level playing field between DPSUs and private players, strengthening financial incentives and market access for private players, transition from cost-based (L1) to technology-based (L1T1) procurement model, expanding private sector access to R&D and testing facilities have already been addressed earlier in the chapter. The other important recommendation is;

**7.3.1.1. Encouraging Public-Private Collaboration for Exports and Innovation:** Strategic alliances between public sector undertakings and private enterprises can facilitate technology transfer and foster innovation. Collaborations between the public and commercial sectors in defence research and development, workforce training and export marketing would augment India's presence in the global defence market. The government must actively support private enterprises in obtaining worldwide defence contracts to maintain their competitiveness.

### **7.3.2. Boosting MSME Participation:**

**7.3.2.1. Acquisition Preference for MSMEs:** MSMEs are integral to defence production yet frequently have challenges in obtaining direct contracts due to the predominance of DPSUs. The government ought to impose a procurement quota for MSMEs and establish long-term purchase agreements to promote sustainable growth.

**7.3.2.2. Financial Incentives and Access to Capital:** Restricted financial resources impede MSME involvement in defence initiatives. The government could enhance low-interest lending programs, offer tax benefits and establish specialised funding initiatives for MSME defence. Moreover, expedited distribution of subsidies will guarantee the financial viability of MSMEs.

**7.3.2.3. Collaboration between MSMEs, DPSUs and DRDO:** MSMEs frequently encounter obstacles in obtaining technology, R&D and testing facilities. DPSUs and DRDO should form structured alliances with MSMEs to facilitate collaboration on advanced defence projects. Facilitating economical access to DRDO laboratories and DPSU testing facilities will significantly improve innovation and product quality.

#### **7.3.2.4. Enhancing Transparency and Procurement Strategy:**

Numerous MSMEs have challenges due to unpredictability in defence procurement schedules thereby, complicating long-term strategic planning. The government ought to disseminate explicit procurement roadmaps, establish transparent selection standards and enhance information regarding forthcoming defence contracts. This would assist MSMEs in synchronising their production capacity with market demand and enhancing their competitiveness.

#### **7.3.3. National Skill India Mission:**

Skill levels of the workforce is undoubtedly the most important human resource aspect contributing towards achieving self-reliance under the Atmanirbhar Bharat initiative. Most of the relevant recommendations have already been discussed earlier in the chapter, including; the requirement of industry-academia collaboration for practical learning, focus on high-tech and emerging skills and streamlining bureaucratic approvals and funding, etc, the other important recommendations are;

##### **7.3.3.1. Aligning Skill India with National Strategic Goals:**

Skill India must be incorporated into India's overarching self-reliance strategy, especially in domains such as defence, space and vital technologies. By aligning skill development activities with national security and industrial policy goals, India can cultivate a globally

competitive, future-ready workforce that advances its technical and strategic aspirations.

#### **7.4. R&D and Technology Indigenization:**

**7.4.1. Strengthening iDEX:** Most of the recommendations have already been covered in the earlier chapters including; Increased Funding and Sustainable Financial Models, Faster Execution of innovations and Reduced Bureaucratic Delays and Expanding Industry and Academia Collaboration. Some other important recommendations are;

##### **7.4.1.1. Market Access and Defence Procurement**

**Integration:** Presently, iDEX provides finances but does not have a systematic procurement integration. The government must issue direct directives to successful innovators, guaranteeing the commercialisation and integration of their innovations into defence supply chains. Furthermore, iDEX projects ought to be regarded as R&D ventures rather than conventional procurement cases, facilitating the expedited adoption of disruptive technology.

##### **7.4.1.2. Greater Promotion and Recognition of iDEX**

**Innovations:** To enhance the attraction of high-calibre companies and innovators, iDEX must augment its awareness, visibility and industry recognition. Successful projects ought to be publicly exhibited,

recognised and incorporated into broader government defence initiatives to enhance credibility and market presence.

## **7.5. Lessons from Other Countries:**

### **7.5.1. Chinese Model of Military-Civil Fusion and Large-Scale**

**Investment:** Chinese Military-Civil Fusion (MCF) strategy facilitates integrated cooperation among the military, academic institutions and commercial sector, expediting domestic defence advancement. Substantial government investment in R&D, as well as manufacturing, has enabled China to swiftly enhance its defence production capabilities by utilising reverse engineering to modify and advance foreign technologies.

### **7.5.2. Israel's High-Tech Innovation and Export-Led Growth Model:**

Israel has concentrated on high-tech defence innovations, especially in artificial intelligence, cybersecurity, unmanned aerial vehicles and missile defence systems, establishing itself as a global leader in modern military technologies. Further, Israel's defence exports bolster its domestic sector, enabling the financing of additional research and development while ensuring self-sufficiency without undue dependence on government subsidies.

### **7.5.3. South Korea's Public-Private Collaboration and Skill**

**Development Model:** PPP model in South Korea has effectively included private enterprises into significant security initiatives, thereby augmenting creativity and efficiency. Moreover, its robust technical education and

workforce training initiatives guarantee a proficient defence workforce while smart worldwide alliances enable South Korea's defence companies to compete in international markets.

#### **7.5.4. USA Model of Private Sector Leadership and Industry-Academia**

**Collaboration:** The US defence sector is driven by private companies and universities. DARPA plays a crucial role in funding disruptive technologies such as stealth aircraft, hypersonic missiles and AI-based warfare systems. India's DRDO needs to follow a similar as DARPA and the private sector needs to lead in defence manufacturing;

#### **7.5.5. French Model of State-Backed Private Industry and Strong Export**

**Strategy:** France balances government oversight with private innovation, ensuring indigenous production of major platforms like Rafale fighter jets and Barracuda-class submarines, etc. France's strong export strategy has promoted it to become the third-largest arms exporter. India needs to follow the PPP and SPM model for promoting its private industry backed by the State and also pursue a strong and long-term export strategy to become one of the larger exporters in the world.

### **7.6. Conclusion:**

The recommendations in the chapter seek to comprehensively tackle the challenges and obstacles encountered by India's defence manufacturing sector. India has achieved notable advancements in promoting infrastructure and encouraging

private sector involvement; however, significant challenges remain, including bureaucratic impediments, insufficient R&D funding and weak supply chain resilience. The proposed reforms aim to expedite the indigenisation process, cultivate a cooperative environment between public and private sectors, optimise procurement procedures and promote innovation. By effectively implementing these proposals, India may fortify its defence industrial base, diminish external dependence and elevate its status as a major exporter of defence equipment.

## **CHAPTER 8**

### **CONCLUSION**

India's pursuit of self-reliance in defence manufacturing and transforming into a major defence exporter, through the Atmanirbhar Bharat initiative signifies a pivotal transformation in national security and economic strategy. Historically, India's substantial dependence on foreign defence imports rendered the nation susceptible to external pressures and supply chain disruptions, as demonstrated by numerous geopolitical events and supply restrictions discussed in this dissertation. The Atmanirbhar Bharat initiative, supported by significant and ever evolving policies like the DAP 2020, DPEPP 2020, DICs, PLI scheme, iDEX initiative, Positive Indigenisation Lists, etc, has instituted structural reforms in India's defence procurement and manufacturing sectors.

This dissertation concludes that much progress has been achieved in the first four years of its introduction, including;

- An incremental rise in domestic production, attaining ₹1.27 lakh crore in FY 2023-24.
- A significant increase in defence exports, from ₹686 crore in 2013-14 to ₹21,083 crore in 2023-24.

- The expansion of private sector involvement now accounts for approximately 20.8% of defence output alongside Defence Public Sector Undertakings (DPSUs).
- The advancement of indigenous platforms, including Tejas LCA, INS Vikrant, Pinaka rocket system and Akash missiles exemplify the increasing domestic capabilities.

However, enduring issues such as delays in technology transfers, reliance on foreign OEMs for essential technologies (e.g., aircraft engines, electronics), constrained R&D investment relative to global peers and regulatory impediments that hinder procurement processes still persist. The interviews and survey results underscore prevalent issues about bureaucratic inefficiencies, the necessity for enhanced private sector involvement and demands for additional changes in quality assurance, talent development and research and development investments.

Comparative analysis of global defence manufacturing models, including China's Military-Civil Fusion, Israel's private sector-led innovation model and South Korea's export-driven strategy, Americas DARPA led innovations and private industry led model and Frances hybrid model of combining state and private sector strengths in defence manufacturing, highlights the necessity for India's to work on a hybrid model suiting itself for achieving self-reliance by enhancing collaborative innovation ecosystems and incentivised partnerships between the public and private sectors.

India is progressing towards diminishing its reliance on foreign imports and establishing a robust domestic defence industry environment. The dissertation offers pragmatic proposals, such as augmenting MSME involvement, optimising procurement timeframes, fortifying PPP frameworks and prioritising essential technology advancement to expedite India's progress towards complete defence self-sufficiency.

In the coming years, maintaining pace under Atmanirbhar Bharat will necessitate;

- Reforms in institutional frameworks for procurement and export enhancement.
- Increased investment in R&D emphasising advanced technology.
- Establishing a globally competitive private defence industry. Utilising collaborations with academic institutions, startups, and international partners.
- The quest for self-reliance in defence is not solely an economic goal but a fundamental element of India's strategic autonomy and national security.

- Establishing a strong and resilient domestic defence infrastructure will enable India to enhance border security, assert regional influence and become a significant participant in the global defence supply chain.

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**ASSESSING THE EFFECTIVENESS OF ATMANIRBHAR BHARAT IN  
DEFENCE SELF-RELIANCE: QUESTIONNAIRE**

Dear Respondent,

Thank you for participating, I am Brig Sunil Narayanan and in this research study on **India's Atmanirbhar Bharat initiative in the defence sector**. The aim of this questionnaire is to gather insights on **the progress, challenges and future opportunities** for India's defence self-reliance. This forms part of the study being carried out by me while pursuing my Masters degree in Advanced Professional Programme in Public Administration from Indian Institute Public Administration at Delhi.

**Voluntary Participation:** Participation is completely voluntary. You may choose to withdraw from the survey at any time without any negative consequences.

**Anonymity & Confidentiality:** All responses will remain anonymous and will be used solely for academic purposes. No personal identifiable information (PII) will be collected or stored and all data will be kept confidential.

**Data Usage:** The responses you provide will be analysed in an aggregate format and no individual responses will be identifiable. By submitting your response, you consent to the use of your answers for academic research.

The questionnaire consists of **multiple sections** and should take approximately **5-6 minutes** to complete.

If you have any questions or concerns, please feel free to contact me at [\(ksunilnn1@gmail.com\)](mailto:ksunilnn1@gmail.com).

Thank you for your valuable time and insights!

### **Section 1: Respondent Profile & Background Information**

**1. What is your age group? (Select one)\***

- 18-35
- 36-50
- 51 and above

**2. What is your highest level of education? (Select one)\***

- Graduate Degree
- Postgraduate Degree
- MPhil/ Doctorate
- Other

**3. How many years have you been associated with defence-related work? (Select one)\***

- Less than 5 years
- 5-10 years
- 10-20 years
- More than 20 years

**4. What is your role in the defence sector? (Select one)\***

- Armed Forces Personnel
- Defence Industry Employee (DPSU, Private, MSME)
- Researcher/Academia
- Government Official

- Other

**5. Which sector do you primarily work in? (Select one)\***

- Aerospace and Aviation
- Naval Systems
- Armaments & Artillery
- Cybersecurity & Electronic Warfare
- Research & Development (R&D)
- Manufacturing & Production
- Other

**6. How do you stay informed about India's defence sector developments? (Multiple Choice – select all relevant choices)\***

- News articles and media reports
- Government publications and press releases
- Defence industry conferences and expos
- Social media discussions
- Others

**Section 2: Awareness of Atmanirbhar Bharat in Defence**

**7. How familiar are you with the Atmanirbhar Bharat initiative in defence? (Select one) \***

- Very Familiar
- Somewhat Familiar
- Not Familiar

**8. How would you rate the overall effectiveness of the Atmanirbhar Bharat initiative in defence? (Select one)\***

- Highly Effective
- Moderately Effective
- Neutral
- Slightly Effective
- Not Effective at All

**9. What are the most significant policy changes you have observed under Atmanirbhar Bharat? (Multiple Choice – select all relevant choices)\***

- Increase in domestic procurement
- Growth in defence exports
- Increase in private sector participation
- Development of new defence manufacturing hubs (DICs)
- Promotion of indigenous research & development
- All of the above

**10. What specific aspects of Atmanirbhar Bharat in defence do you find most impactful? (Multiple Choice – select all relevant choices)\***

- Increased private sector participation
- Growth in defence exports
- Strengthening of MSMEs and startups in defence
- Technological advancements in indigenous manufacturing
- All of the above

**11. Which of the following defence-related developments have you heard about? (Multiple Choice – select all relevant choices)\***

- Indigenous fighter aircraft (Tejas LCA)
- BrahMos missile system
- INS Vikrant (Indigenous Aircraft Carrier)
- Defence Industrial Corridors
- Defence Exports Growth
- All of the above

### **Section 3: Challenges in Achieving Self-Reliance in Defence**

**12. What do you think are the biggest challenges in making India self-reliant in defence? (Multiple Choice – select all relevant choices)\***

- Dependence on foreign technology
- Lack of funding for defence R&D
- Bureaucratic inefficiencies
- Low private sector participation
- Skilled workforce shortage
- All of the above

**13. How confident are you that India will become a global defence manufacturing hub in the next decade? (Linear Scale: 1 = Not Confident, 10 = Extremely Confident)\***

- 1 - 10

**14. Do you support increased government spending on defence R&D? (Select one )\***

- Yes, absolutely
- Somewhat
- No, focus should be elsewhere
- Not Sure

**15. In your opinion is public-private partnerships relevant for the following tasks? (Multiple Choice – select all relevant choices)\***

- Facilitating technology transfers and knowledge sharing
- Enhancing investments in defence R&D
- Reducing bureaucratic inefficiencies in procurement
- Creating more opportunities for MSMEs and startups
- All of the above

**16. Do you believe that Indian Industries are capable of absorbing transfer of technology from other countries? (Select one)\***

- Yes, absolutely
- Somewhat
- No, focus should be elsewhere
- Not Sure

**17. Do you believe that Indian labour is skilled enough for highly specialised defence production? (Select one)\***

- Yes, absolutely

- Somewhat
- No, focus should be elsewhere
- Not Sure

**18. How would you rate the efficiency of the procurement process under DAP 2020? (Select one)\***

- Highly Efficient
- Moderately Efficient
- Neutral
- Inefficient
- Highly Inefficient

**19. Do you think the Atmanirbhar Bharat initiative adequately supports MSMEs and Startups in the defence sector? (Select one)\***

- Yes, significantly
- Somewhat, but more support is needed
- No, there is little support for MSMEs
- Not Sure

#### **Section 4: Future Outlook and Recommendations**

**20. What should be the top priority for India's defence industry? (Select one)\***

- Manufacturing modern fighter jets & warships
- Advancing missile and space defence technology
- Investing in cybersecurity and AI-based warfare

- Expanding defence exports
- All of the above

**21. What role should the private sector play in achieving defence self-reliance? (Multiple Choice – select all relevant choices)\***

- Lead the production of defence equipment
- Collaborate with DRDO for research and development
- Develop indigenous technological capabilities
- Support MSMEs in defence manufacturing
- Expand global defence collaborations
- All of the above

**22. Which defence sub-sectors should India focus on for indigenous development? (Multiple Choice – select all relevant choices)\***

- Aerospace (fighter jets, drones)
- Naval Systems (submarines, aircraft carriers)
- Armaments and Artillery
- Cybersecurity and AI-driven warfare
- Electronic Warfare and Surveillance
- Space Defence and Satellite Warfare
- All of the above

**23. How can India ensure that defence self-reliance also contributes to economic growth and job creation? (Multiple Choice – select all relevant choices)\***

- Encouraging more defence manufacturing hubs

- Increasing skill development programs
- Expanding defence exports to global markets
- Creating incentives for private sector and MSMEs
- All of the above

**24. Do you think India is positioned to become a major global defence exporter? (Select one)\***

- Yes, within the next 5 years
- Yes, but it will take 10+ years
- No, major obstacles remain
- Not Sure

**25. What measures should India take to strengthen its defence exports? (Multiple Choice – select all relevant choices)\***

- Expand global defence trade agreements
- Fast-track export approvals and licensing
- Develop more export-oriented defence production hubs
- Offer financial incentives for exporting defence firms
- Focus on developing cost-competitive indigenous weapons
- All of the above

**26. What policies should the government prioritize to enhance defence self-reliance? (Multiple Choice – select all relevant choices) \***

- Increase defence R&D spending to at least 2% of GDP
- Strengthen Public-Private Partnerships (PPPs)

- Expand Defence Industrial Corridors (DICs)
- Promote greater FDI in defence manufacturing
- Enhance skill development programs for defence technology
- All of the above

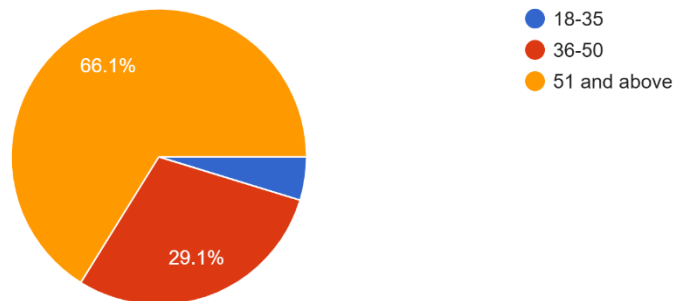
**27. Would you be interested in learning more about India's defence manufacturing achievements through government outreach programs? (Select one)\***

- Yes
- No
- Maybe

**ASSESSING THE EFFECTIVENESS OF ATMANIRBHAR BHARAT IN**  
**DEFENCE SELF-RELIANCE : PUBLIC RESPONSE**

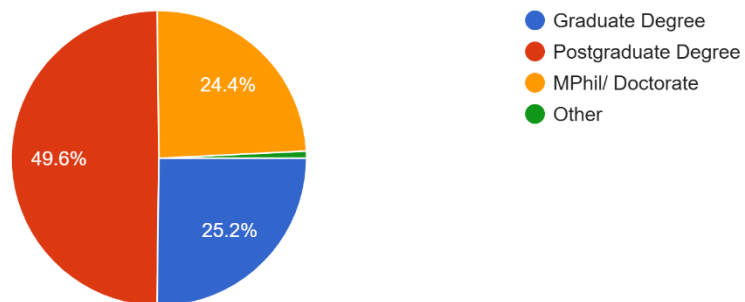
1. What is your age group? (Select one)

127 responses

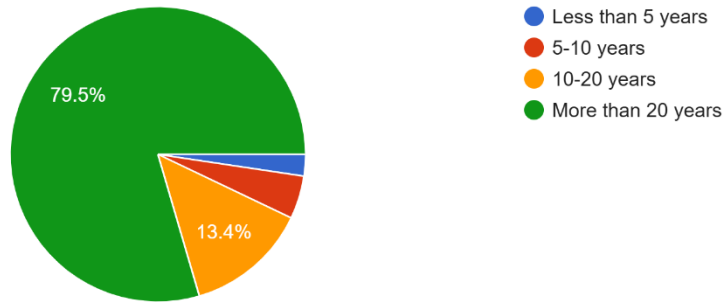


2. What is your highest level of education? (Select one)

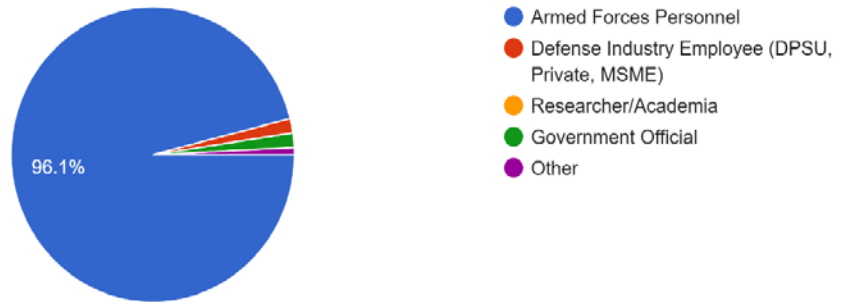
127 responses



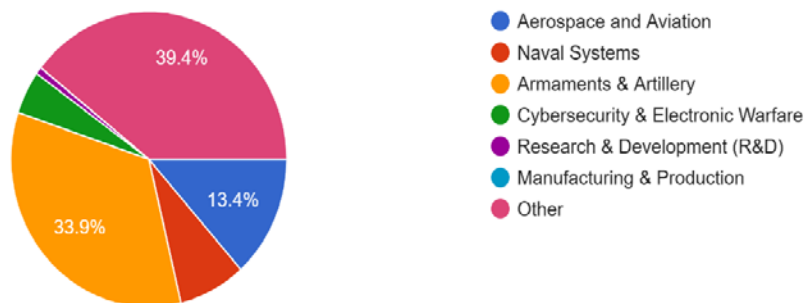
3. How many years have you been associated with defense-related work? (Select one)  
127 responses



4. What is your role in the defense sector? (Select one)  
127 responses

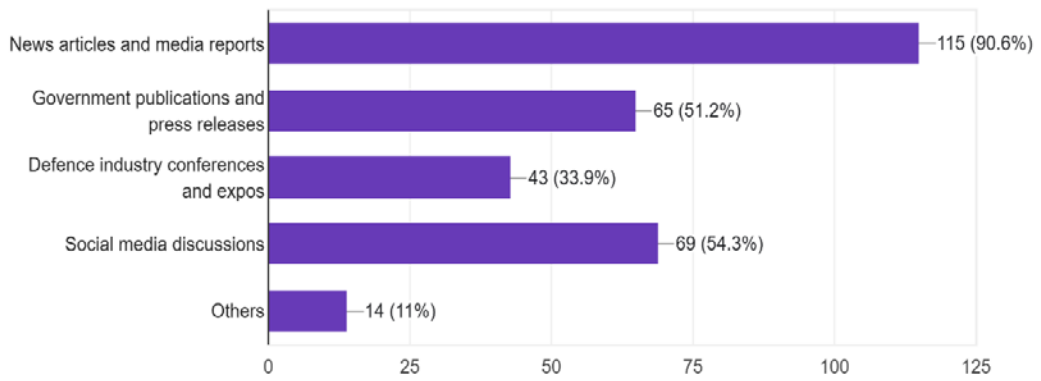


5. Which sector do you primarily work in? (Select one)  
127 responses



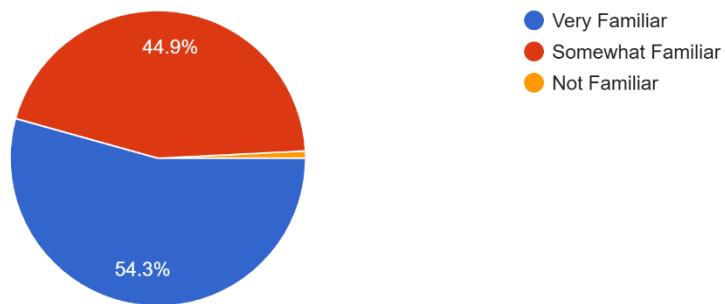
6. How do you stay informed about India's defence sector developments? (Multiple Choice – select all relevant choices)

127 responses



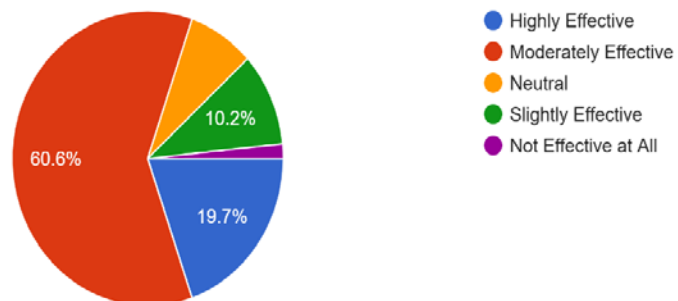
7. How familiar are you with the Atmanirbhar Bharat initiative in defense? (Select one)

127 responses



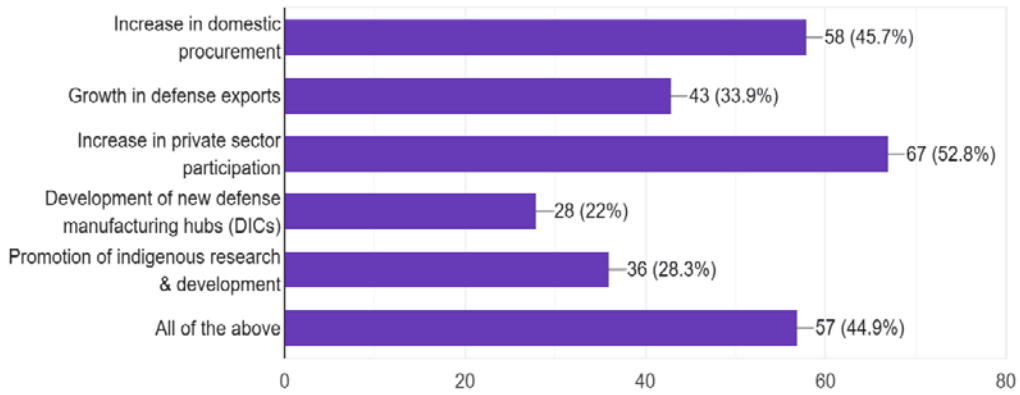
8. How would you rate the overall effectiveness of the Atmanirbhar Bharat initiative in defense? (Select one)

127 responses



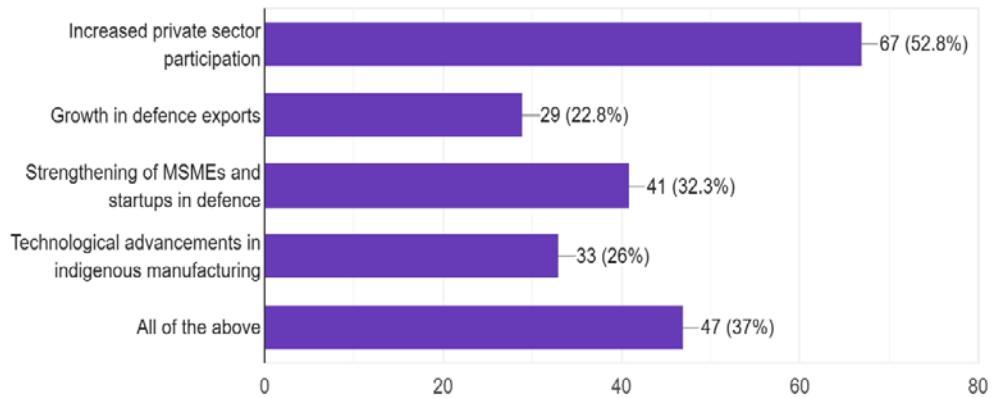
9. What are the most significant policy changes you have observed under Atmanirbhar Bharat?  
(Multiple Choice – select all relevant choices)

127 responses



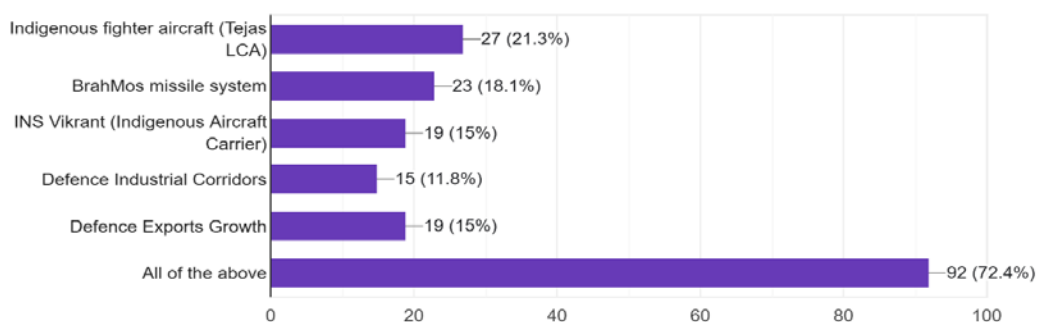
10. What specific aspects of Atmanirbhar Bharat in defence do you find most impactful? (Multiple Choice – select all relevant choices)

127 responses



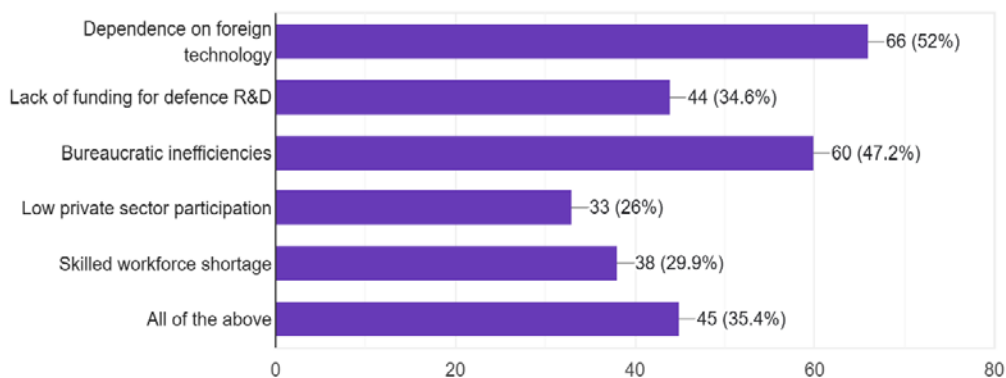
11. Which of the following defence-related developments have you heard about? (Multiple Choice – select all relevant choices)

127 responses



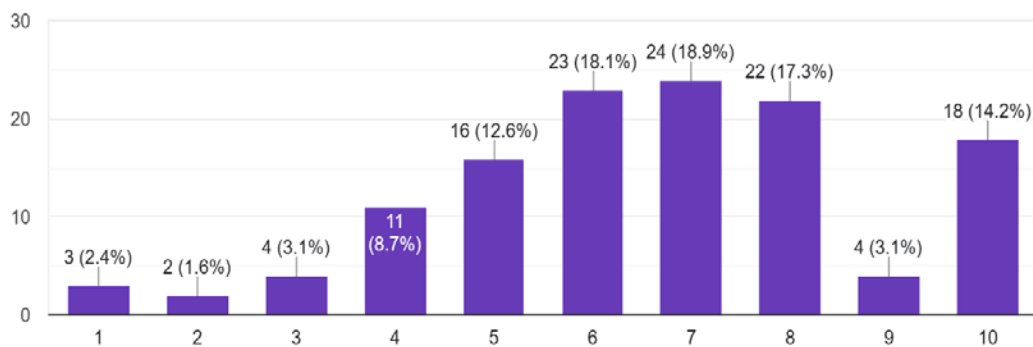
12. What do you think are the biggest challenges in making India self-reliant in defence? (Multiple Choice – select all relevant choices)

127 responses



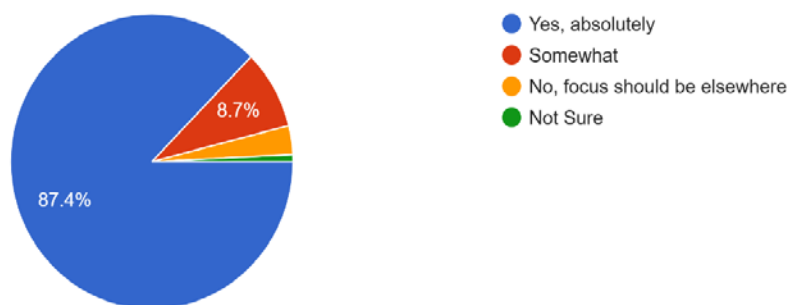
13. How confident are you that India will become a global defence manufacturing hub in the next decade? (Linear Scale: 1 = Not Confident, 10 = Extremely Confident)

127 responses



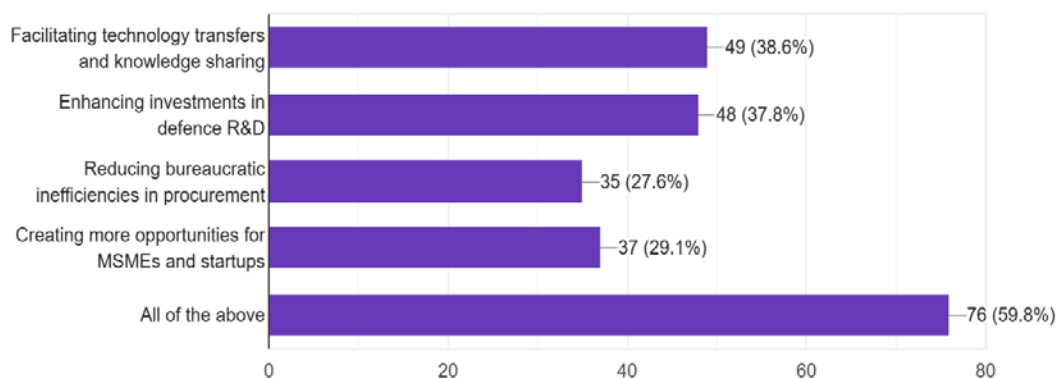
14. Do you support increased government spending on defence R&D? (Select one)

127 responses



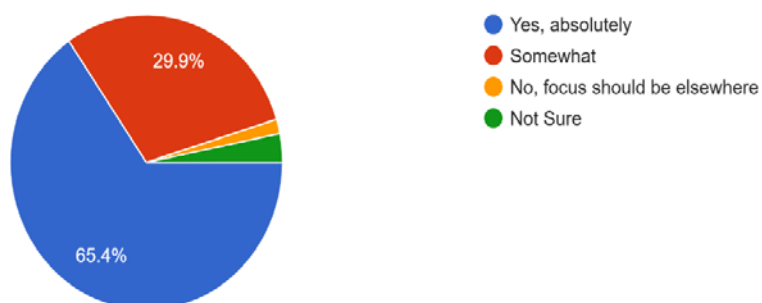
15. In your opinion is public-private partnerships relevant for the following tasks? (Multiple Choice – select all relevant choices)

127 responses



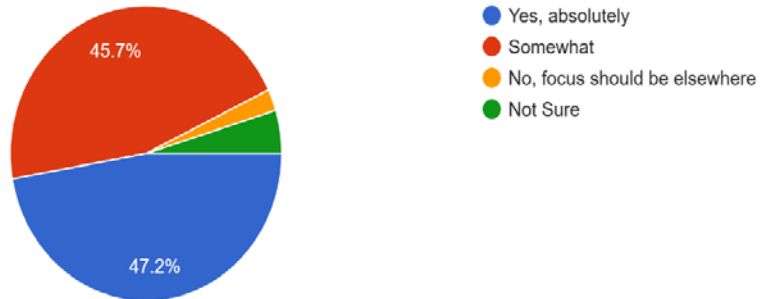
16. Do you believe that Indian Industries are capable of absorbing transfer of technology from other countries? (Select one)

127 responses



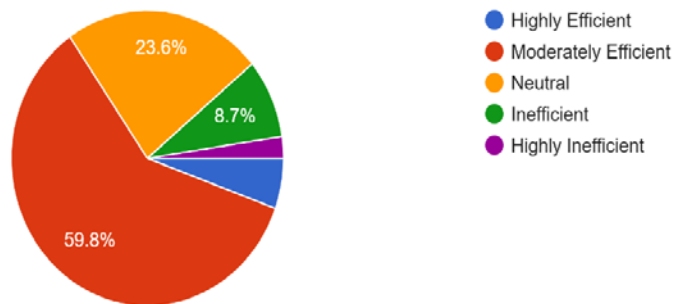
17. Do you believe that Indian labour is skilled enough for highly specialised defence production? (Select one)

127 responses



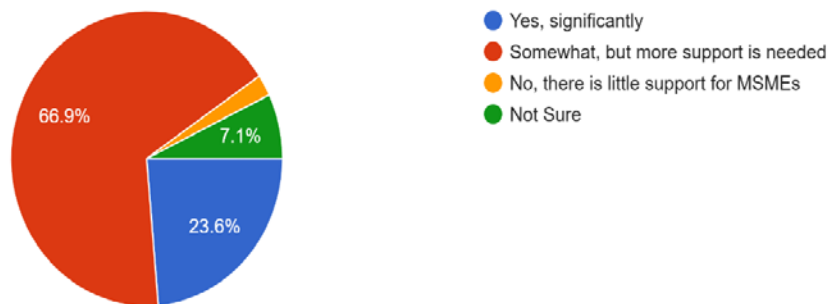
18. How would you rate the efficiency of the procurement process under DAP 2020? (Select one)

127 responses



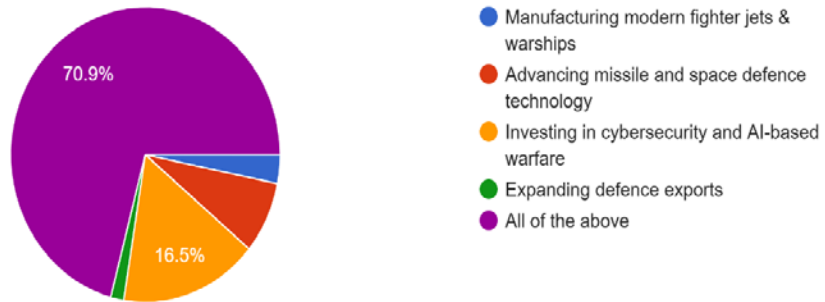
19. Do you think the Atmanirbhar Bharat initiative adequately supports MSMEs and Startups in the defense sector? (Select one)

127 responses



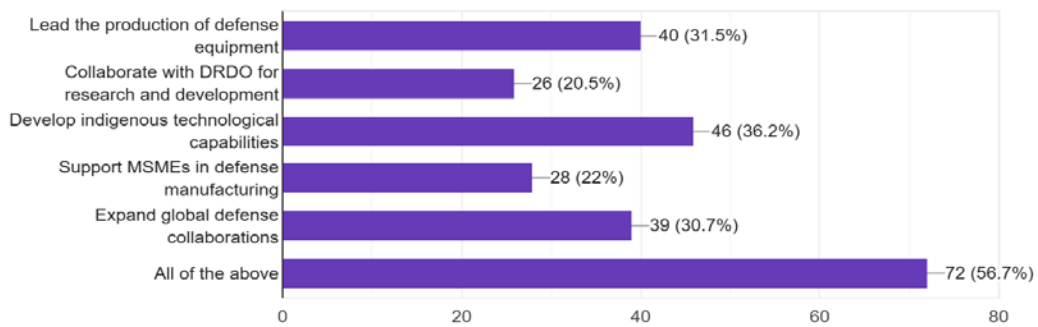
20. What should be the top priority for India's defence industry? (Select one)

127 responses



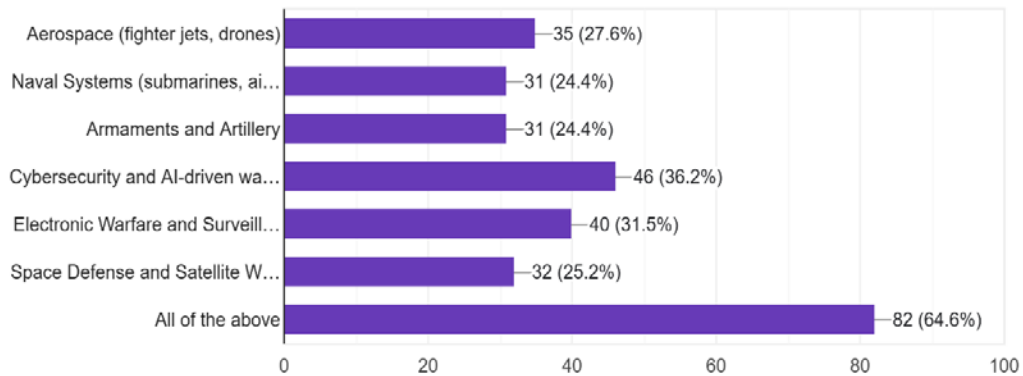
21. What role should the private sector play in achieving defense self-reliance? (Multiple Choice – select all relevant choices)

127 responses



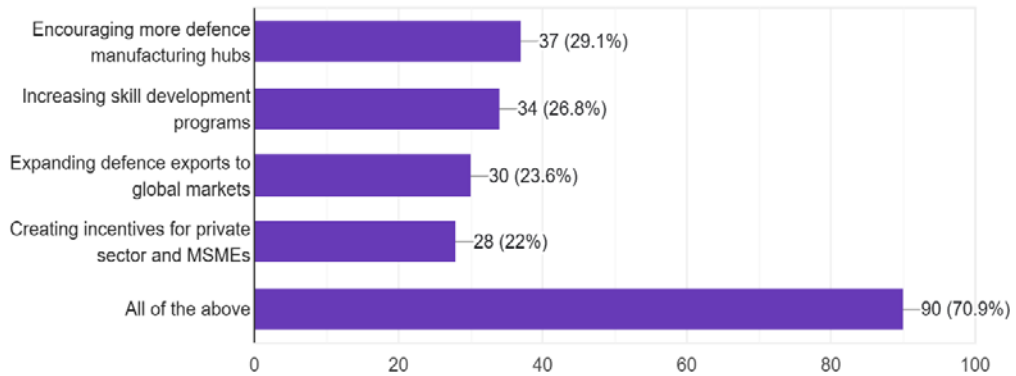
22. Which defense sub-sectors should India focus on for indigenous development? (Multiple Choice – select all relevant choices)

127 responses



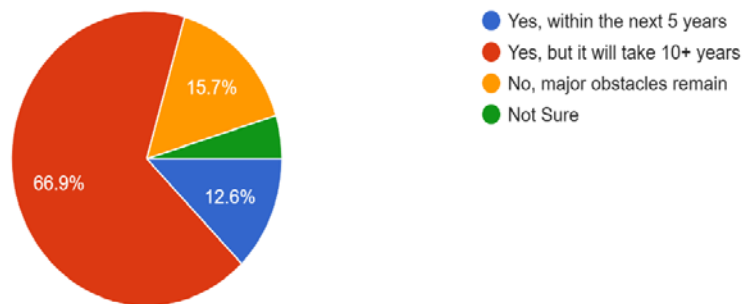
23. How can India ensure that defence self-reliance also contributes to economic growth and job creation? (Multiple Choice – select all relevant choices)

127 responses



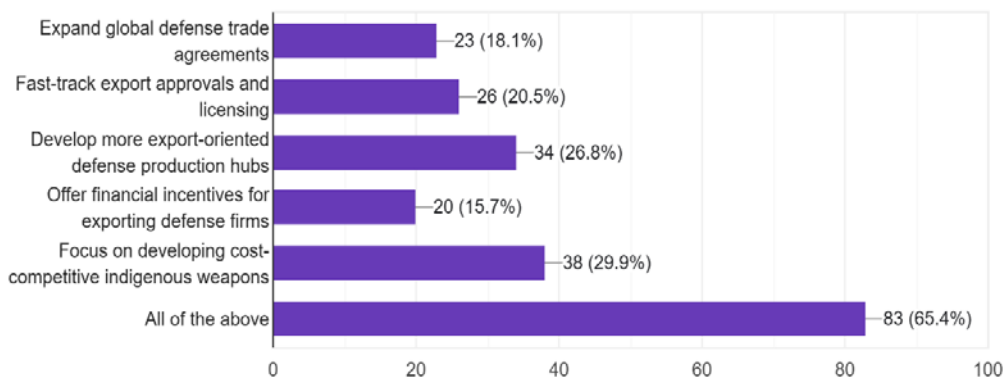
24. Do you think India is positioned to become a major global defense exporter? (Select one)

127 responses



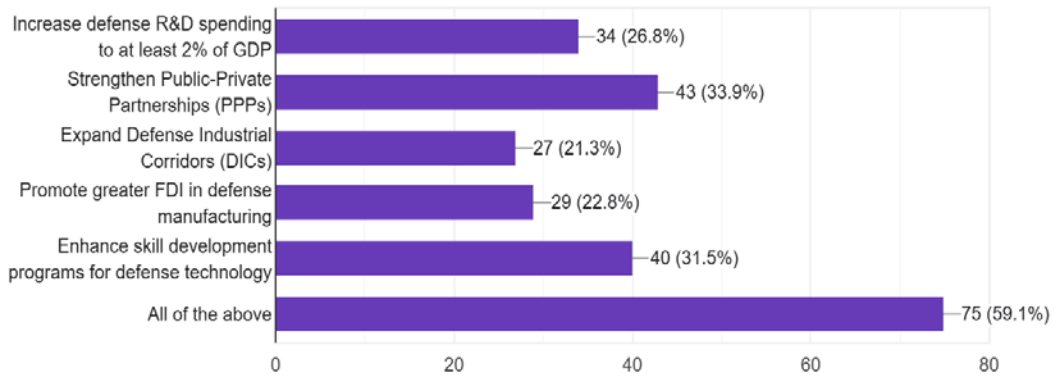
25. What measures should India take to strengthen its defense exports? (Multiple Choice – select all relevant choices)

127 responses



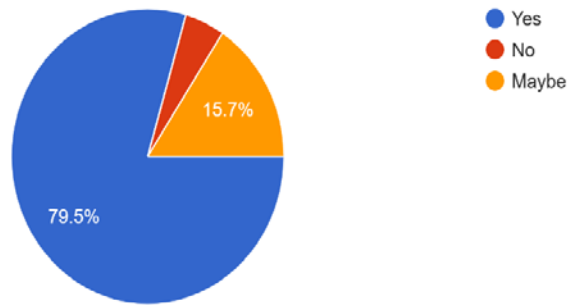
26. What policies should the government prioritize to enhance defense self-reliance? (Multiple Choice – select all relevant choices)

127 responses



27. Would you be interested in learning more about India's defence manufacturing achievements through government outreach programs? (Select one)

127 responses



**ATMANIRBHAR BHARAT : EXPERT INTERVIEW QUESTIONNAIRE**

Dear Respondent,

Thank you for participating, I am Brig Sunil Narayanan and in this research study on **India's Atmanirbhar Bharat initiative in the defence sector**. The aim of this questionnaire is to gather insights on **the progress, challenges and future opportunities** for India's defence self-reliance. This forms part of the study being carried out by me while pursuing my Masters degree in Advanced Professional Programme in Public Administration from Indian Institute Public Administration at Delhi.

**Voluntary Participation:** Participation is completely voluntary. You may choose to withdraw from the survey at any time without any negative consequences.

**Anonymity & Confidentiality:** All responses will remain anonymous and will be used solely for academic purposes. No personal identifiable information (PII) will be collected or stored and all data will be kept confidential.

**Data Usage:** The responses you provide will be analysed in an aggregate format and no individual responses will be identifiable. By submitting your response, you consent to the use of your answers for academic research.

The questionnaire consists of **multiple sections** and should take approximately **10 minutes** to complete.

If you have any questions or concerns, please feel free to contact me at ([ksunilnn1@gmail.com](mailto:ksunilnn1@gmail.com)).

Thank you for your valuable time and insights!

\* Indicates required question

### **Section 1: Respondent Profile & Professional Background**

**1. Which sector best describes your professional role? (Select one answer)\***

- Armed Forces (Veteran)
- Government Official (MoD, DRDO, DPSU)
- Private Defence Industry Executive
- Researcher/Academia
- Others

**2. How many years of experience do you have in the defence sector? (Select one answer)\***

- Upto 10 years
- 10-20 years
- More than 20 years

**3. Which defence domain do you primarily specialize in? (Select one answer)\***

- Aerospace & Aviation

- Naval Systems
- Armaments & Artillery
- Cybersecurity & Electronic Warfare
- Policy and Governance
- Defense Research & Development
- Manufacturing & Production
- Other

## **Section 2: Perception of Atmanirbhar Bharat in Defence**

### **4. How would you rate India's progress in achieving defence self-reliance under**

**Atmanirbhar Bharat? (Select one answer) \***

- Highly Effective
- Moderately Effective
- Neutral
- Slightly Effective
- Not Effective at All

### **5. What do you believe has been the most significant achievement under**

**Atmanirbhar Bharat in defence? (Multiple Choice – Select upto 3 answers)\***

- Increased domestic defence production
- Growth in exports of indigenous defence equipment
- Greater participation of private-sector companies
- Strengthening of Defence R&D and innovation
- Development of Defence Industrial Corridors (DICs)
- Others

**6. Do you believe that the latest Defence Acquisition Procedure (DAP) 2020, which is promoting indigenous production over procurement from foreign**

**countries, would help the defence preparedness of the armed forces? (*Select one answer*) \***

- Yes, it is adequate
- Partially, but improvements are needed
- No, significant changes are required

**7. What areas need further reforms, or what measures need to be included in the DAP 2020 to make it more effective? (*Short Answer*)**

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**8. Do you believe that the Draft Defence Production & Export Promotion Policy (DPEPP) 2020 is sufficient to assist India in enhancing its defence exports and self-sufficiency? (*Select one answer*) \***

- Yes, it is adequate
- Partially, but improvements are needed
- No, significant changes are required

**9. What or areas need further reforms in DPEPP 2020? (*Short Answer*)**

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**10. Do you think the current Positive Indigenisation Lists will help India achieve self-reliance? (*Select one answer*) \***

- Yes, it is adequate
- Partially, but improvements are needed
- No, significant changes are required

**11. Would you like to add a comment on the Positive Indigenisation list? (*Short Answer*)**

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**12. Do you believe that the creation of Defence Industrial Corridors (DICs) will boost defence manufacturing? (*Select one answer*)\***

- Yes, it is adequate
- Partially, but improvements are needed
- No, significant changes are required

**13. What more needs to be done to make DICs more effective? (*Short Answer*)**

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**14. Do you believe the current 74% FDI in the defence sector is adequate? (*Select one answer*)\***

- Yes it is adequate
- Not sure
- Partially, but improvements are needed
- No, significant changes are required

**15. Would you like to add a comment on improving the efficacy of the FDI in the defence sector? (*Short Answer*)**

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**16. The government has introduced Production Linked Incentive (PLI) schemes in speciality steel, drone technology, etc. Are these adequate to increase defence production? (*Select one answer*)\***

- Yes, it is adequate
- Not sure

- Partially, but improvements are needed
- No, significant changes are required

**17. Has the Strategic Partnership Model (SPM) been successful? (Select one answer)\***

- Yes, it is adequate
- Not sure
- Partially, but improvements are needed
- No, significant changes are required

**18. What more needs to be done to make the SPM successful? (Short answer)**

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**19. Has the conversion of Ordinance Factories to DPSUs worked towards increasing accountability and production? (Select one answer)\***

- Yes, it is adequate
- Not sure
- Partially, but improvements are needed
- No, significant changes are required

**20. Is privatising DPSUs the solution to increase their accountability and reliability ? (Select one answer)\***

- Yes
- Not sure
- Partially
- No

**21. What needs to be done to increase the reliability and accountability of the DPSUs? (Short answer)**

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**22. The government initiated a scheme for Financial Assistance to Defence Attaches (DAs) to promote Indian defence exports. Has it been beneficial? (*Select one answer*)\***

- Yes, it is adequate
- Not sure
- Partially, but improvements are needed
- No, significant changes are required

### **Section 3: Challenges in Achieving Self-Reliance**

**23. In your opinion, what are the biggest roadblocks preventing India from achieving self-reliance in defence? (*Multiple Choice – Select upto 3 answers*)\***

- Dependence on foreign suppliers for critical technologies (e.g., jet engines, radars, semiconductors)
- Limited private-sector involvement in defence production
- Slow procurement and bureaucratic delays
- Insufficient investment in defence R&D
- Lack of structured industry-academia collaboration
- Others

**24. What are the key challenges in defence exports and global competitiveness for India? (*Short Answer*)**

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**Section 4: Role of Private Sector and MSMEs in Defence Manufacturing**

**25. Do you think the private sector has been adequately integrated into defence manufacturing under Atmanirbhar Bharat? (Select one answer)\***

- Yes, the private sector is playing a key role
- Somewhat, but further inclusion is needed
- No, DPSUs still dominate the sector

**26. What additional measures should be taken to boost private-sector participation? (Short Answer)**

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**27. Do you think the government has taken adequate initiatives to strengthen the integration of MSMEs in defence production? (Select one answer)\***

- Yes, it is adequate
- Partially, but improvements are needed
- No, significant changes are required

**28. What measures need to be undertaken to ensure better support to the MSMEs and startups towards achieving Atmaribhar Bharat? (Short answer)**

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**29. Do you believe that the National Skill India Mission in its present form is adequate for achieving self-sufficiency and absorbing the transfer of technology from other countries?\***

- Yes, it is adequate

- Partially, but improvements are needed
- No, significant changes are required

**30. What more needs to be done to make the National Skill India Mission more effective? (Short answer)**

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**31. Has the Srijan initiative of the government had a positive effect on Atmanirbhar Bharat Abhiyan?\***

- Yes, it has positive effect
- Partially, but improvements are needed
- No, significant improvements are required

**32. Is removal of Offset obligations from Inter-Governmental Agreements (IGA) and Foreign Military Sales by the government is a step in the right direction? (Select one response)**

- Yes
- Offset must be restricted to Transfer of Technology
- Partially
- No

#### **Section 5: Research & Development and Technology Indigenization**

**33. India spends only 0.9% of GDP on defence R&D, compared to China (2.2%) and Israel (4.9%). How should India increase indigenous defence R&D? (Multiple Choice – Select up to 3 answers)\***

- Increase government R&D investment to at least 2% of GDP

- Strengthen public-private R&D partnerships
- Create a dedicated Defence Innovation Fund
- Expand iDEX and defence startup incubation programs
- Other

**34. Do you believe that the iDEX initiative has been a game-changer? (Select one answer)\***

- Yes, it is adequate
- Partially, but improvements are needed
- No, significant changes are required

**35. What more needs to be done to make iDEX more effective? (Short answer)**

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**36. What areas of defence technology should India prioritise for domestic development? (Multiple Choice – Select upto 3)**

- Jet engines and propulsion systems
- Cyber warfare and AI-driven defence systems
- Advanced missile and drone technology
- Electronic warfare and surveillance systems
- Naval warships and submarines
- Space defence and satellite-based security
- Other

## **Section 6: Future Strategy and Policy Recommendations**

**37. What specific policies or structural changes would you recommend to strengthen India's defence self-reliance? (*Short answer*)**

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**38. What lessons can India learn from countries like China, Israel and South Korea in achieving defence self-sufficiency? (*Short answer*)**

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**39. On a scale of 1-10, how confident are you that India will achieve full defence self-reliance by 2035? (*Linear Scale: 1 = Not Confident, 10 = Extremely Confident*)\***

- 1 - 10

**40. Any additional comments, suggestions, recommendations or insights you would like to share on the subject? (*Optional – Short Answer*)**

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**41. Would you be willing to participate in a follow-up discussion or provide further insights? (*Select one answer*)\***

- Yes (Please provide contact details below)
- No

**42. If yes, please provide your name and preferred contact details (email/phone number)**

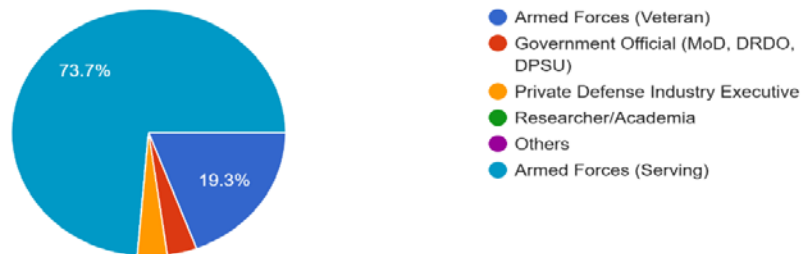
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**ATMANIRBHAR BHARAT: EXPERTS OPINION**

**Section 1: Respondent Profile & Professional Background**

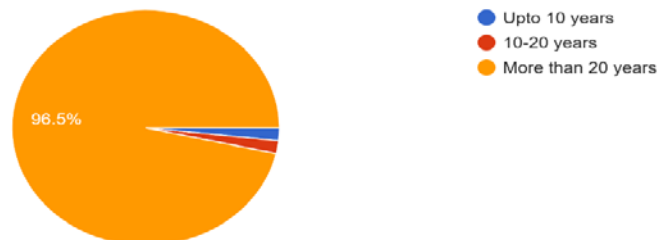
1. Which sector best describes your professional role? (Select one answer)

57 responses



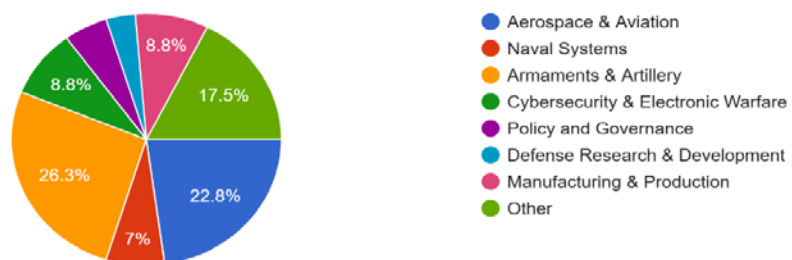
2. How many years of experience do you have in the defense sector? (Select one answer)

57 responses



3. Which defense domain do you primarily specialize in? (Select one answer)

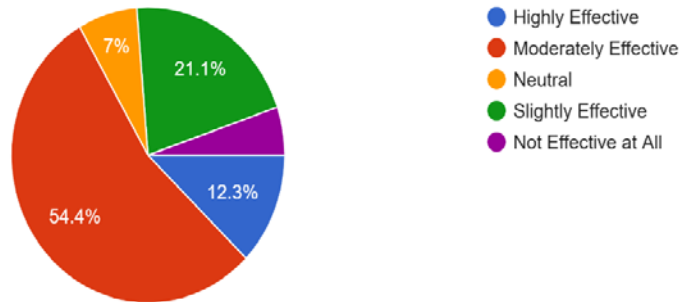
57 responses



## Section 2: Perception of Atmanirbhar Bharat in Defence

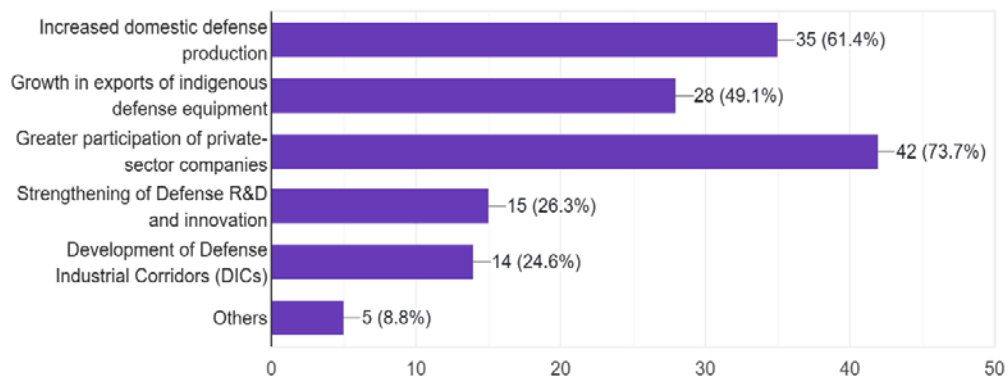
4. How would you rate India's progress in achieving defense self-reliance under Atmanirbhar Bharat? (Select one answer)

57 responses



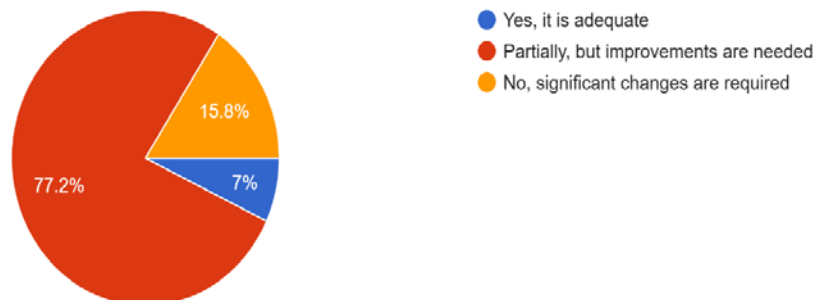
5. What do you believe has been the most significant achievement under Atmanirbhar Bharat in defense? (Multiple Choice – Select upto 3 answers)

57 responses



6. Do you believe that the latest Defence Acquisition Procedure (DAP) 2020, which is promoting indigenous production over procurement from foreignness of the armed forces? (Select one answer)

57 responses



**7. What areas need further reforms, or what measures need to be included in the DAP 2020 to make it more effective?**

**Ans.**

**7.1. Enhancing R&D and Indigenous Innovation:** There is a need to increase R&D funding and reduce bureaucratic hurdles in approvals. India must move away from the L1 (lowest bidder) concept and prioritize quality and technology over cost. Need to encourage private sector involvement in defence R&D with long-term financial support. Nominate industry partners for development of niche technology. Expand participation in iDEX and ADITI schemes to accelerate indigenous innovation.

**7.2. Streamlining Procurement Processes & Reducing Bureaucracy:** Simplify procurement approval cycles and reduce MoD interference in routine acquisitions. Reduce the decision-making timelines, especially for operational priority procurements. Shorter procurement cycles and simplification of licensing requirements. GeM (Government e-Marketplace) should be used for faster procurement of off-the-shelf (COTS) equipment. Reduce involvement of Defence Finance (FA) and internal financial advisors (IFAs) in operational decision-making.

**7.3. Strengthening Private Sector Participation:** Ensure a level playing field between DPSUs and private defence companies. Encourage long-term contracts and partnerships with private players to ensure sustainability. Reduce government nomination of DPSUs and allow private firms to compete

on equal terms. Encourage foreign OEM collaborations with Indian firms while ensuring higher indigenous content.

**7.4. Quality Control and Accountability:** Accountability for quality and timelines must be strengthened, and delays should be penalized. More stringent vendor assessment mechanisms to ensure quality across supply chains. Strengthen oversight over DPSUs, DRDO, and HAL to improve efficiency and delivery. Reform quality assurance mechanisms (DGQA, CEMILAC, DGAQA) to global standards.

**7.5. Reforms in Indigenization & Strategic Partnerships:** Gradual increase in indigenous content instead of forcing 50-60% localization in a short period. More strategic collaborations with countries like the US, Israel, and NATO members while ensuring technology transfers. Encourage Make-in-India projects with an export focus, reducing dependency on Indian firms partnering with foreign OEMs just for name sake.

**7.6. Policy Structuring & Institutional Reforms:** Establish a Civil-Military Fusion structure to integrate defence and commercial technology. Reorganize HAL like the OFB (Ordnance Factory Board restructuring) and separate R&D from production. Create a task force for each major defence project to ensure real-time monitoring. Comprehensive competency mapping of the Indian defence industry to correctly identify critical voids.

**7.7. Addressing Software and Emerging Technology Gaps:** Develop indigenous defence software ecosystems to reduce dependency on foreign operating systems. Liberalized procurement for emerging technologies, especially in AI, cybersecurity, and autonomous systems.

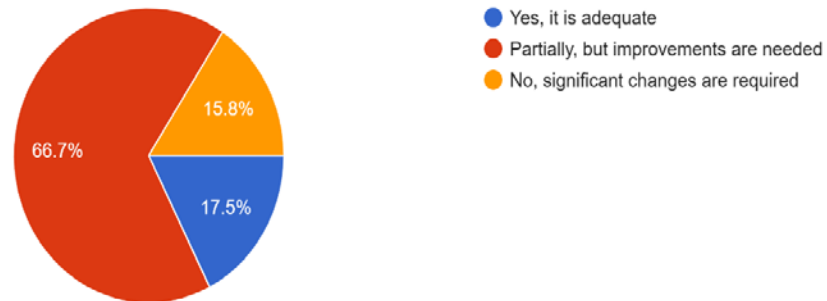
**7.8. Financial & Structural Policy Adjustments:** Defence procurement should incorporate a mix of financial and non-financial performance metrics. Reduce financial dependency on offsets and shift towards direct investment in critical areas. Encourage investment in complex "Make" projects with clear financial incentives.

**Final Takeaways: What Needs to Change in DAP 2020?**

1. Shift from cost-based procurement (L1) to technology-based selection (L1T1).
2. Faster decision-making cycles for acquisitions, especially for operational priority procurements.
3. Stronger public-private partnerships (PPP) and incentives for MSMEs.
4. More accountability for DPSUs, DRDO, and quality assurance mechanisms.
5. Better policy support for indigenous defence R&D, including long-term funding structures.
6. Reforms in software security and defence IT systems.
7. Global strategic partnerships for joint production, ensuring higher Indian participation.
8. Reduced bureaucratic intervention in procurement decision-making.

8. Do you believe that the Draft Defence Production & Export Promotion Policy (DPEPP) 2020 is sufficient to assist India in enhancing its defence exports and self-sufficiency? (Select one answer)

57 responses



9. What or areas need further reforms in DPEPP 2020? (*Short Answer*)

**Ans**

### 1. Policy and Regulatory Simplifications

- Need for simplification of the policy to make compliance easier for industry stakeholders.
- Sector-based approach should be incorporated for targeted reforms.
- One-window clearance mechanism for licenses, including import/export permits for raw materials and specialized defence components.

### 2. Strengthening R&D and Innovation

- Greater investment in R&D and technology development funding for both public and private sectors.
- Encouragement of indigenous software development to reduce reliance on foreign defence software.
- Harnessing domestic talent and preventing brain drain in the defence sector.
- Artificial Intelligence (AI) and automation-based production facilities should be encouraged.

### **3. Enhancing Private Sector Participation & MSME Growth**

- Stronger incentives for private players to manufacture defence equipment, including tax benefits.
- Technology-sharing mechanisms between DPSUs and private firms to enhance innovation.
- Providing seed funding and financial assistance for private sector and MSMEs in defence production.

### **4. Improving Quality Control and Certification Processes**

- Reforms in certification and quality assurance (QA) mechanisms to improve defence product reliability.
- Restructuring of CEMILAC and DGQA under the Department of Military Affairs (DMA) for better oversight.
- Introduction of penal clauses for delayed production and poor quality standards.

### **5. Promoting Defence Exports**

- Stronger incentives for defence exports, particularly in emerging technology areas like drones, AI-based systems, and counter-drone technology.
- Reduction in bureaucratic hurdles for export approvals, including:
  - Trial & Sample provision to friendly nations.
  - Centralized vetting by MEA for bulk approvals, instead of case-by-case clearances.
  - Switch from raw material exports to finished defence products for higher value generation.

- Focus on small arms, ammunition, UAVs, and specialist vehicles as export priorities.

## **6. Strengthening Governance & Strategic Vision**

- Creation of an independent governing body separate from DDP (Department of Defence Production) for export regulation.
- Standardization of defence equipment to reduce inventory costs and improve interoperability.
- Clear long-term strategic vision that aligns defence production with geopolitical export opportunities.

## **7. Faster Implementation of DPEPP 2020**

- Many experts pointed out that DPEPP 2020 is still in draft stage and needs to be formally promulgated.
- Multi-stakeholder engagement is necessary to ensure a balanced policy that caters to private sector, MSMEs, and large defence manufacturers.

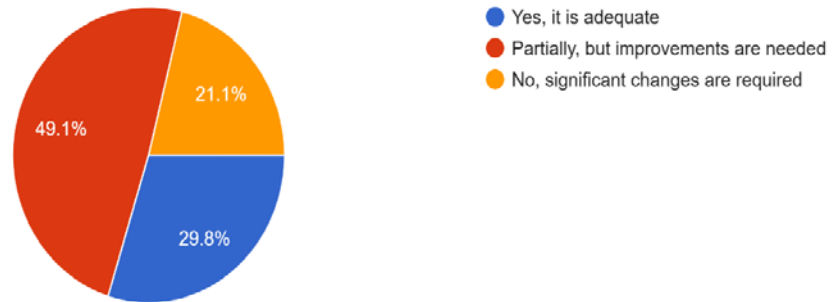
## **Key Takeaways for Reform Priorities in DPEPP 2020**

- Simplify licensing and regulatory framework to improve ease of doing business.
- Increase financial incentives for R&D, innovation, and exports.
- Improve quality assurance mechanisms by restructuring certification bodies (DGQA, CEMILAC).
- Encourage private sector participation through technology-sharing agreements with DPSUs.
- Reduce approval time for defence exports by implementing bulk clearance mechanisms.

- Formally implement DPEPP 2020 with wider stakeholder consultations.

10. Do you think the current Positive Indigenisation Lists will help India achieve self-reliance? (Select one answer)

57 responses



11. Would you like to add a comment on the Positive Indigenisation list? (*Short*

*Answer*)36 responses

**Ans**

#### **Key Takeaways from Responses:**

- **Expansion of the Indigenisation List**
  - Many experts believe that more items should be progressively added to the Positive Indigenisation List (PIL).
  - The list should include critical subcomponents rather than just entire platforms.
- **Challenges in Implementation**
  - Several respondents feel the timeline for achieving indigenisation is unrealistic, as it does not account for production and operationalization delays.

- Some experts argue that DPSUs and large private firms use the PIL as a tool to block foreign OEMs without necessarily delivering on commitments.
- **Quality & Sustainability Concerns**
  - Sustainable indigenous manufacturing needs to be prioritized over temporary localization.
  - The issues of quality and timeline adherence must be addressed.
  - More technology demonstration projects with flexible timelines should be included.
- **Need for a More Systematic Approach**
  - Instead of an item-wise listing, some experts propose a system-wise classification for more effective implementation.
  - Industry inputs should be factored in more effectively to ensure practical execution.
- **Integration of Critical and Future Technologies**
  - Priority should be given to communication systems, missile systems, nuclear technology, and AI integration.
  - Industry 4.0 technologies should be emphasized.
- **Indigenisation Strategy & Roadmap**
  - Some respondents feel the PIL is too ambitious without a clear plan on how to achieve it.
  - Detailed R&D and indigenisation plan be prepared for each item.
- **Government Policy Considerations**
  - PIL should be updated regularly and aligned with India's foreign policy and needs.

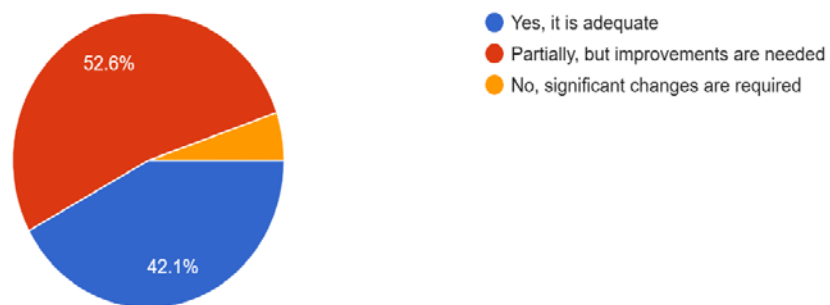
- More clarity and segmentation are needed across the five existing PIL.

### Conclusion

- The Positive Indigenisation List is seen as a critical policy initiative to boost domestic defence manufacturing.
- However, experts believe that practical implementation hurdles, industry readiness, and lack of long-term clarity hinder its effectiveness.
- A strategic roadmap with clear targets, R&D support, and production timelines is required to make indigenisation sustainable and realistic.

12. Do you believe that the creation of Defence Industrial Corridors (DICs) will boost defence manufacturing? (Select one answer)

57 responses



13. What more needs to be done to make DICs more effective? (*Short Answer*)35

responses

**Ans**

#### 1. Financial Incentives and Investment Support

- Provide financial incentives to encourage private sector participation.
- Offer tax breaks and assured procurement to ensure sustainability.
- Greater investment in R&D & innovation funding for startups & MSMEs.

- Introduce SEZ type benefits for companies operating in DICs.

## **2. Infrastructure and Industry Development**

- Develop infrastructure in DICs to support manufacturing and testing.
- Ensure single-window clearance for approvals and clearances.
- Strengthen logistics and supply chain mechanisms to facilitate smooth production and distribution.
- Create sector-specific clusters within DICs to foster specialization (e.g., armoured vehicles, artillery, ammunition).

## **3. R&D and Technological Advancements**

- Encourage private industry investment in R&D.
- DICs should have in-house R&D divisions.
- Facilitate collaboration between DRDO, private industries and academic institutions.
- Develop dual-use technology to enhance commercial viability.

## **4. Policy and Regulatory Reforms**

- Simplify regulatory framework to make participation easier for private players.
- Reduce bureaucratic hurdles in procurement and approval processes.

## **5. Market Access and Export Promotion**

- Encourage export-oriented policies to help Indian defence companies compete internationally.
- Improve quality standards for Indian defence products to meet global benchmarks.

## **6. MSME and Startup Ecosystem Development**

- Provide structured mentoring and handholding for MSMEs to integrate them into the defence supply chain.
- Facilitate engineering guidance, certification, and qualification handholding for startups.
- Decentralize and empower MSMEs within the DIC framework to reduce dependence on DPSUs.

## **7. Skill Development and Workforce Training**

- Strengthen skill development programs for engineers and technicians.
- Encourage involvement of academic institutions for specialized training in defence manufacturing.
- Build a defence-oriented workforce to meet the demands of new technologies.

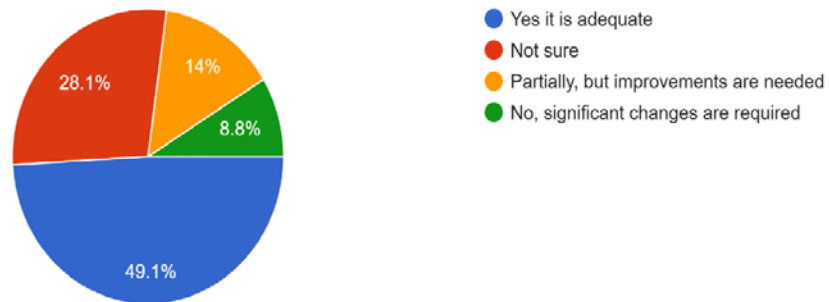
## **8. Testing and Quality Assurance**

- DICs should establish advanced testing infrastructure to support new product validation.
- Integrate DICs with regional quality assurance (QA) mechanisms.
- Define testing standards for emerging technologies such as drones, AI, and 3D printing.

## **9. Strengthening the Defence Ecosystem**

- Ensure DICs include all key stakeholders, including central and state PSUs, private players, and defence forces.
- Enhance coordination between the government, armed forces, and industry for policy execution.
- Formulate clear procurement commitments for firms investing in DICs.

14. Do you believe the current 74% FDI in the defence sector is adequate? (Select one answer)  
57 responses



15. Would you like to add a comment on improving the efficacy of the FDI in the defence sector? (*Short Answer*) 29 responses

**Ans**

#### **Key Themes from Expert Responses**

- **Technology Transfer (ToT) as a Priority**
  - Experts emphasized that FDI should be tied to mandatory Technology Transfer (ToT) for manufacturing and maintenance.
  - It should serve as a springboard for India's indigenous defence R&D and innovation rather than just enabling assembly work.
- **Encouraging Private Sector Participation**
  - Need to give more weightage to private players over DPSUs.
  - FDI should be aligned with Atmanirbhar Bharat ensuring private industry plays a central role.
- **Establishing a Regulatory and Monitoring Framework**
  - Set up an independent watchdog to monitor FDI inflows, ensure compliance with indigenization norms & prevent foreign monopolization.

- Regular engagement with stakeholders was recommended to track and refine FDI policy outcomes.
- **Potential Policy Enhancements**
  - Some responses advocated for PLI schemes for FDI in defence, similar to other industries.
  - Liberalization of defence export policies could help India leverage foreign investments for boosting exports.
- **Infrastructure & Ecosystem Development**
  - Clear and consistent regulatory framework is needed to facilitate ease of doing business and attract long-term foreign investment.
  - Investing in industrial defence infrastructure and skill development programs was seen as critical for maximizing FDI benefits.
- **Contrasting Views on FDI Expansion**
  - Some experts felt that increasing FDI limits alone would not suffice unless combined with ease of doing business reforms and anti-corruption measures.
  - Few experts supported 100% FDI in defence, while others stressed that it should be temporary and gradually lead to increased IC.

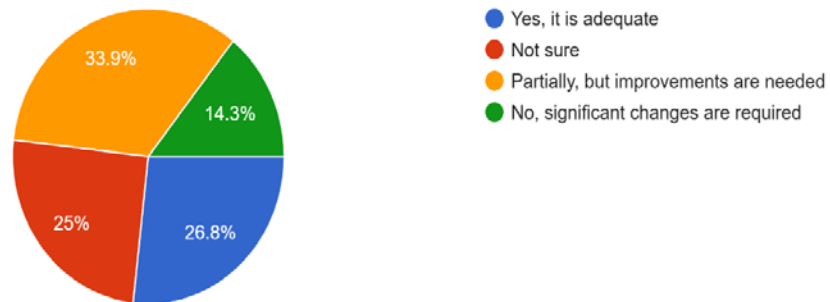
### **Conclusion & Policy Recommendations**

- FDI should not just be about foreign capital; it must actively support defence self-reliance through ToT.
- Stronger regulatory oversight is needed to track FDI effectiveness and ensure alignment with national defence objectives.
- A balance should be maintained between foreign investment and indigenous defence industry growth.

- Ease of doing business reforms should complement FDI liberalization, making India a preferred defence manufacturing hub.

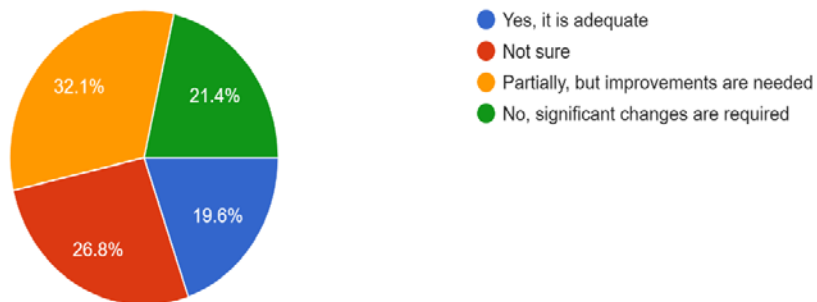
16. The government has introduced Production Linked Incentive (PLI) schemes in speciality steel, drone technology, etc. Are these adequate to increase defence production? (Select one answer)

56 responses



17. Has the Strategic Partnership Model (SPM) been successful? (Select one answer)

56 responses



**18. What more needs to be done to make the SPM successful? (Short answer)**

**Ans**

### **Key Themes and Insights from Responses**

- **Technology Transfer and Research Development**
  - Complete ToT is crucial for the success of the SPM.
  - Need to extend SPM scope to include R&D, similar to DARPA.

- Inadequate ToT guidelines create inefficiencies in capability absorption.
- Demand for niche technology and scalability in production is a key concern.
- **Structural Reforms & Government Role**
  - SPM policy needs to be more market-driven rather than government-controlled.
  - Need for clearer guidelines on risk liability and MoD finance intent.
  - Government intervention should be minimal, allowing industries to drive innovation.
- **Infrastructure & Capability Development**
  - Encourage collaboration between private sector, MSMEs & larger firms.
  - Build indigenous production infrastructure to ensure self-reliance.
  - Strict output auditing of DRDO performance based on actual capabilities.
- **Regulatory and Contractual Issues**
  - Assurance of Minimum Order Quantities and long-term contracts.
  - Clearly defined project-specific Quality Requirements to ensure accountability.
  - Review and adaptation of policies to changing defence needs.
- **Strategic Industry Partnerships**
  - Need for industry consortiums that integrate capabilities across firms.

- Larger firms in SPM must not discourage MSMEs and startups, ensuring inclusivity.
- Integrate tried-and-tested components alongside indigenous innovation.
- **Offset Clause and Financial Strategy**
  - Offset clauses need revision to be effectively implemented.
  - Need greater clarity on funding, incentives, and liability management.
- **Weapon Platform Selection & Scope**
  - Define aims clearly and select weapon platforms carefully.
  - Not every category of defence equipment should be under SPM, focusing on high-value, long-term projects.

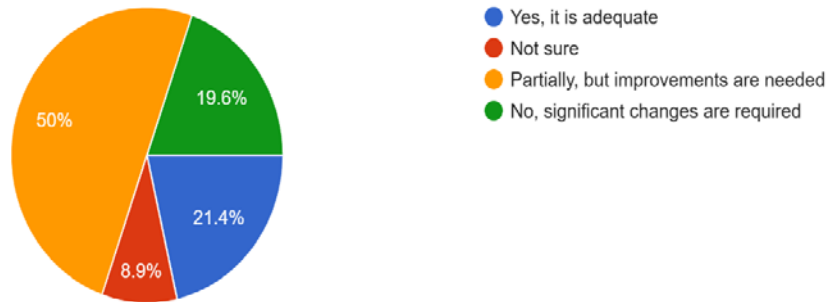
### **Recommendations for Strengthening the SPM Based on Expert Input**

- Expand the scope of SPM beyond production to include R&D.
- Establish a framework for full ToT for critical systems.
- Minimize excessive government control, allowing a more market-driven approach.
- Improve DRDO accountability and performance tracking.
- Streamline risk liability and financial accountability within the MoD.
- Create a structured consortium approach involving larger firms, MSMEs, and startups.
- Develop clearer selection criteria for weapon platforms under SPM.
- Rework offset clauses to provide better implementation and impact.
- Ensure long-term commitment via minimum order quantities and contract assurances.

- Enhance infrastructure to support indigenous defense production.

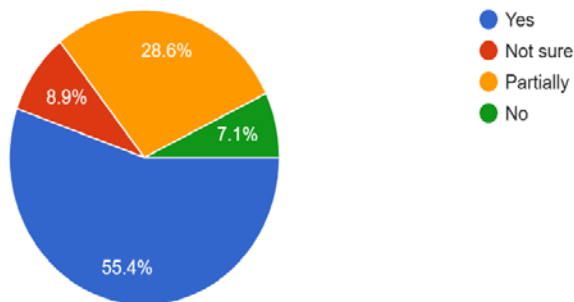
19. Has the conversion of Ordnance Factories to DPSUs worked towards increasing accountability and production? (Select one answer)

56 responses



20. Is privatising DPSUs the solution to increase their accountability and reliability ? (Select one answer)

56 responses



**21. What needs to be done to increase the reliability and accountability of the DPSUs? (Short answer)**

**Ans**

### **1. Enhancing R&D and Innovation**

- Strong in-house R&D to improve indigenous capabilities & reduce reliance on imports.

- Collaboration with academia and private sector to incorporate AI, drone technology, and disruptive innovations.
- Adoption of best practices from global defence industries for tech adaptation.

## **2. Increasing Accountability and Performance Metrics**

- Performance-based evaluation of DPSUs, grading system, and yearly audits to track efficiency.
- Accountability in quality control and timely delivery of projects.
- Result-oriented appraisals with provisions for termination of engagement in case of non-performance.
- Autonomy for DPSU leadership with strict governance frameworks and financial management reforms.

## **3. Encouraging Competition & Market-Driven Efficiency**

- Market-driven, competitive framework to ensure that DPSUs do not function as monopolies.
- DPSUs should compete with private players on equal footing instead of relying on government protectionism.
- Financial penalties for delays and non-performance, ensuring reliability in defence production.
- Prioritization of inventory, large-scale production, and strict delivery timelines.

## **4. Privatization and Structural Reforms**

- Complete privatization of certain DPSUs for increased efficiency and accountability.
- Limited privatization with safeguards to prevent monopolization by select private players.

- PPP models to leverage private sector agility in production and delivery.
- Disinvestment of government stakes in DPSUs to introduce corporate governance principles.

### **5. Depoliticization and Independent Oversight**

- Depoliticization of DPSUs by allowing them to function independently under expert leadership.
- Reduced interference from the MoD and Finance Ministry to ensure efficiency.
- Formation of independent governing bodies to audit performance and set transparent procurement guidelines.

### **6. Workforce Development & Skill Enhancement**

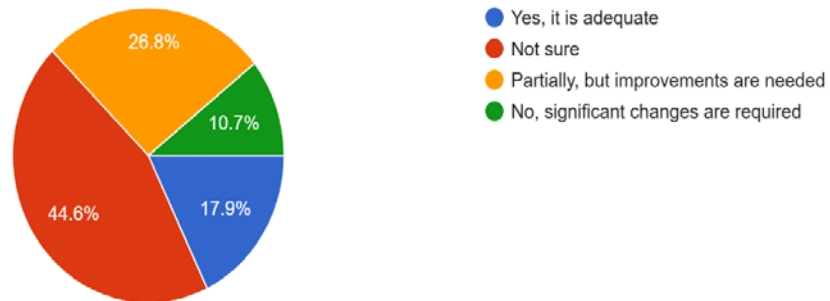
- Restructuring of DPSU recruitment policies to focus on technical expertise rather than seniority.
- Training and skill development programs to create a highly competent technical workforce.
- Performance-based pay structures to motivate employees and improve efficiency.

### **7. Strengthening Quality Assurance & Quality Control**

- Stringent QA/QC mechanisms to ensure high product reliability.
- User-driven testing & trials by incorporating armed forces into the validation process.
- Autonomy for Services HQ (SHQ) in procurement and oversight, instead of DPSUs being managed solely by the Department of Defence Production.

22. The government initiated a scheme for Financial Assistance to Defence Attaches (DAs) to promote Indian defence exports. Has it been beneficial? (Select one answer)

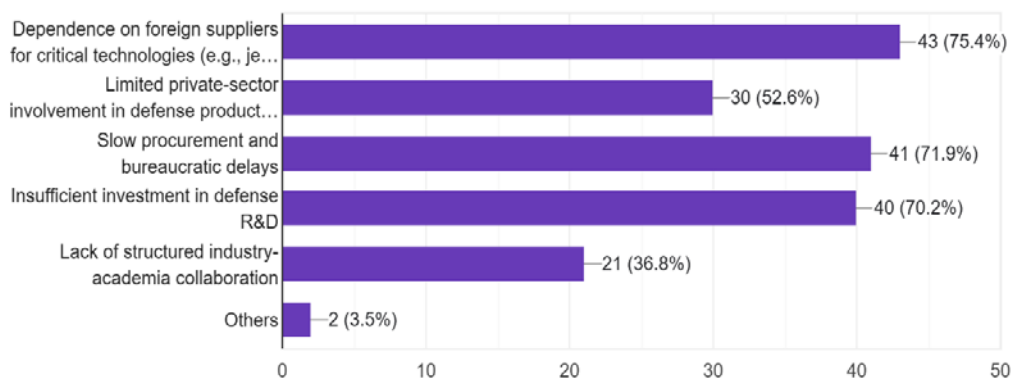
56 responses



### Section 3: Challenges in Achieving Self-Reliance

23. In your opinion, what are the biggest roadblocks preventing India from achieving self-reliance in defence? (Multiple Choice – Select upto 3 answers)

57 responses



24. What are the key challenges in defence exports and global competitiveness for India? (*Short Answer*)

**Ans**

#### 1. Quality and Certification Issues

1. Inconsistent quality standards compared to global benchmarks.
2. Lack of rigorous certification processes acceptable worldwide.

3. Product reliability and after-sales services are perceived as weak.
4. Need for higher quality control and assurance mechanisms.

## **2. Bureaucratic and Policy Hurdles**

- Cumbersome approval process with multiple layers of bureaucracy.
- Lengthy and inefficient export procedures reduce India's competitiveness.
- Lack of coordinated export promotion strategies.
- Restrictions due to India's reliance on foreign-origin licensed defence manufacturing (e.g., Russian approval for exports of certain systems).

## **3. Pricing and Cost Competitiveness**

- High production costs make Indian defence products expensive in the global market.
- Limited government incentives for cost reduction and subsidies for exports.
- Indian defence firms struggle to compete with established global players like China, Israel and South Korea.

## **4. Weak Defence Technology and R&D Ecosystem**

- Lack of original R&D and innovation in high-end defence technology.
- Limited academia-industry collaboration for indigenous research.
- Dependence on foreign OEMs for critical technologies rather than indigenous design and development.

## **5. Market Access and Product Positioning**

- Limited international market presence and lack of strong global outreach strategies.
- Inability to position products effectively against Western, Russian, and Chinese defence manufacturers.

- Need for aggressive marketing and strategic global alliances.

## **6. Niche and Emerging Technology Gaps**

- Limited production and export of high-tech defence equipment like hypersonic weapons, AI-driven defence systems and cyber warfare technologies.
- Indian defence sector is mostly a system integrator rather than an innovator in high-tech defence solutions.

## **7. Strategic Dependencies and Foreign Influence**

1. Dependence on imports for core strategic components limits India's ability to produce fully indigenous defence products for export.
2. Need to reduce reliance on foreign defence suppliers and strengthen domestic supply chains.
3. Potential risk of geopolitical pressures affecting defence trade policies.

## **Key Takeaways and Actionable Steps**

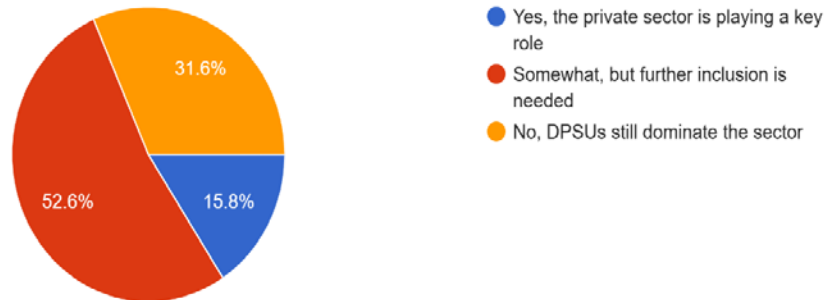
- **Strengthening quality control & certification standards** aligned with global defence markets.
- **Streamlining bureaucratic processes** for faster approvals and efficient export facilitation.
- **Enhancing cost competitiveness** through government incentives, subsidies, and tax breaks.
- **Investing in futuristic technologies** (AI, cyber defence, advanced missile systems, etc.).
- **Expanding international collaborations** to gain a competitive foothold in global defence markets.

- **Reducing strategic dependencies** by developing indigenous critical technologies.

#### Section 4: Role of Private Sector and MSMEs in Defence Manufacturing

25. Do you think the private sector has been adequately integrated into defense manufacturing under Atmanirbhar Bharat? (Select one answer)

57 responses



26. **What additional measures should be taken to boost private-sector participation?** (*Short Answer*)

**Ans**

##### 1. Level Playing Field & Policy Reforms

- Ensure fair competition between DPSUs and private players.
- Remove protectionism that favours DPSUs over private firms.
- Privatization or restructuring of underperforming DPSUs.
- Restrict DPSUs from competing in tenders if three or more private firms are bidding.
- Create an independent oversight agency to audit and regulate DPSUs.

##### 2. Incentives for Private Players

- Tax rebates and import duty concessions for acquiring new technologies.
- Offer long-term handholding and assured bulk orders.

- Provide funding and offsets for private sector R&D investment.
- iDEX and Make-II projects should have better financial support.

### **3. Reforms in Procurement & Market Access**

- Modify the L1 procurement process (quality over lowest cost).
- Allow direct procurement from private sector.
- Ensure faster approval processes by reducing bureaucratic red tape.
- Mandatory private sector participation in every major project.
- Indian Armed Forces should prioritize private sector procurement.

### **4. Strengthening Private R&D & Infrastructure**

- Enable private players to use DRDO and DPSU test facilities at nominal cost.
- Expand infrastructure and financing support for MSMEs in defence.
- Allow private industry to participate in defence training to better understand requirements.
- Increase government funding for iDEX and Make projects to drive private innovation.

### **5. Encouraging Public-Private Collaboration**

- Promote joint ventures between DPSUs and private players.
- Encourage cross-pollination of experts between public and private sectors.
- Government should assist in export promotion and international collaborations for private firms.

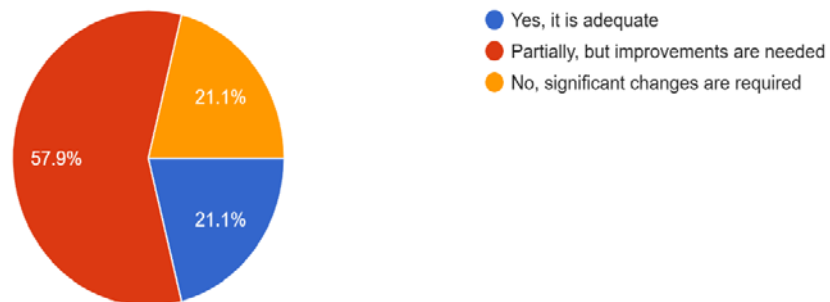
### **Key Takeaways**

- Need for greater transparency, reduced bureaucracy, and more streamlined approvals.

- DPSUs should not be allowed to dominate the market at the cost of private innovation.
- Stronger financial and policy incentives are needed for private investment in R&D.
- Better infrastructure, testing facilities, and market access should be provided to private players.
- India's private sector needs strategic long-term government support to sustain participation.

27. Do you think the government has taken adequate initiatives to strengthen the integration of MSMEs in defence production? (Select one answer)

57 responses



**28. What measures need to be undertaken to ensure better support to the MSMEs and startups towards achieving Atmaribhar Bharat? (*Short answer*)**

**Ans**

### **1. Funding & Financial Incentives**

- Tax rebates, exemptions, and financial incentives to encourage participation.
- Low-interest loans and capital investment assistance for startups.

- Advance payments for procurement on submission of a bank guarantee.
- Increased funding for R&D to help MSMEs develop innovative technologies.
- Incentive-based models similar to iDEX with enhanced government funding.

## **2. Policy & Regulatory Reforms**

- Liberalization of policies and reduced bureaucratic red tape to facilitate smoother participation.
- Transparent selection processes for MSMEs in defence projects.
- Relaxation of financial barriers & credit facilitation for startups to compete effectively.

## **3. Market Access & Procurement Opportunities**

- Guaranteed long-term orders to ensure financial sustainability.
- Increased direct procurement from MSMEs rather than through DPSUs.
- Better visibility of upcoming procurement plans to allow MSMEs to prepare & invest.
- Incentives for large defence firms to integrate MSMEs into their supply chain.

## **4. R&D & Technology Transfer**

- Government handholding in R&D efforts for MSMEs and startups.
- Greater technology transfer from DPSUs and DRDO to private players.
- Access to testing, prototyping, and trial facilities without heavy financial burdens.
- Collaboration between MSMEs and defence PSUs to promote indigenous innovation.

## 5. Institutional & Administrative Reforms

- Easing bureaucratic hurdles and reducing influence of DPSUs in MSME projects.
- Streamlining regulatory approvals and simplifying compliance for small businesses.
- Integration of MSMEs with educational institutions and research centres.
- Creation of an MSME-specific defence cluster with targeted support programs.

## 6. Awareness & Capacity Building

- Increased public awareness & promotion of defence startups.
- Skill development initiatives for MSME employees to meet industry requirements.
- Handholding and mentorship programs for startups from established defence firms.

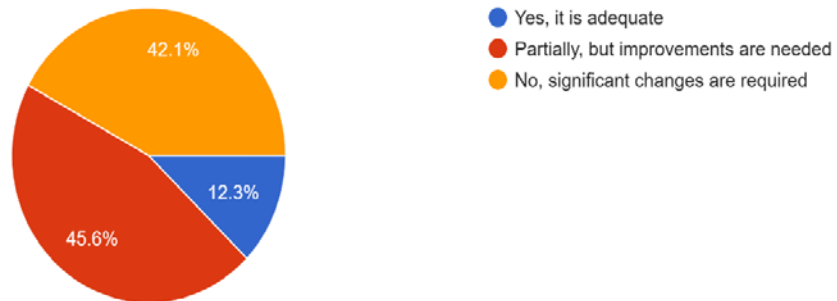
## Final Analysis

To make **Atmanirbhar Bharat more effective**, the government should:

1. Provide direct procurement preference to MSMEs.
2. Strengthen financial incentives and access to loans.
3. Reduce bureaucracy and ease licensing requirements.
4. Promote greater collaboration between MSMEs, DPSUs, and DRDO.
5. Ensure transparent selection and better planning visibility for upcoming defense procurements.

29. Do you believe that the National Skill India Mission in its present form is adequate for achieving self-sufficiency and absorbing the transfer of technology from other countries?

57 responses



**30. What more needs to be done to make the National Skill India Mission more effective? (Short answer)**

**Ans**

### **Key Takeaways from Expert Responses**

#### **1. Higher Absorption into Jobs**

- The mission should ensure better job placements for skilled personnel.
- More emphasis on linking skilling programs to industry job requirements.

#### **2. Industry-Academia Collaboration**

- Stronger partnerships between educational institutions and industry to tailor skill development programs.
- Collaboration through internships, apprenticeships, and joint training programs with companies like DRDO, HAL, BEL, and private defence firms.
- Government-sponsored projects should facilitate real-world exposure for trainees.

### **3. Focus on Niche and Critical Technologies**

- The defence sector requires highly specialized skills in areas like:
  - Artificial Intelligence (AI)
  - Semiconductors
  - Cybersecurity
  - Critical Minerals Processing
  - Advanced Materials
- Experts suggest international training programs to send skilled workers abroad for high-tech skill acquisition.

### **4. Need for Practical, Hands-On Training**

- Shift from theoretical training to practical, industry-oriented skilling.
- Vocational training and exposure to real-world production environments should be mandatory.
- On-the-job training programs, internships, and apprenticeships must be scaled up.

### **5. Overhaul of Policies and Monitoring Mechanisms**

- Better infrastructure, quality trainers, and high-tech training centers.
- The Skill India Mission should be integrated with other national missions, such as:
  - National AI Mission
  - Semiconductor Mission
  - Cybersecurity Mission
  - Defence Production Mission
- Stronger monitoring & evaluation frameworks are needed to assess program impact.

## **6. Targeted Training & Specialization**

- Specific training programs should be designed based on industry demand rather than political motives.
- More focus on critical skill gaps in defence, aerospace, and electronics.
- Encourage brain drain reversal by offering incentives to retain skilled workforce.

## **7. Systemic Reforms and Policy Enhancements**

- The education policy needs to be restructured to integrate skill development at earlier levels.
- Merit-based selection for R&D jobs in the defence sector.
- Specialized training modules for defence-related sectors should be incorporated.

## **8. Addressing Bureaucratic Challenges**

- Less bureaucratic interference and more expert-driven training models.
- Reduce reliance on retired government officials as trainers and involve industry veterans and technocrats.

## **9. Increased Inclusivity and Accessibility**

- Make the Skill India Mission more inclusive, reaching a wider range of beneficiaries, including grassroots-level workers.
- Remove barriers such as complex entry requirements and unnecessary reservations.

## **10. Strategic National Approach**

- Skill development programs should align with long-term national security and technological self-reliance goals.

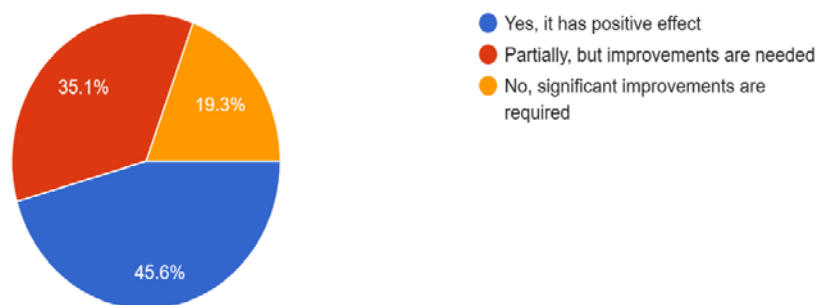
- A mission-mode approach is required to scale up and align skill development with India's strategic defence needs.

### Final Recommendations

- Stronger collaboration between industry and academia – internship-based learning and real-world exposure.
- Greater focus on high-tech skills – AI, semiconductors, cyber, aerospace, and critical minerals.
- Restructure education and skill development policies – emphasize specialization and practical exposure.
- Reduce bureaucratic hurdles – streamline approvals and funding processes.
- Make Skill India part of national strategic initiatives – link it with India's technological self-reliance goals.
- Enhance funding and incentives – provide seed money and incentives for industry-led skilling programs.

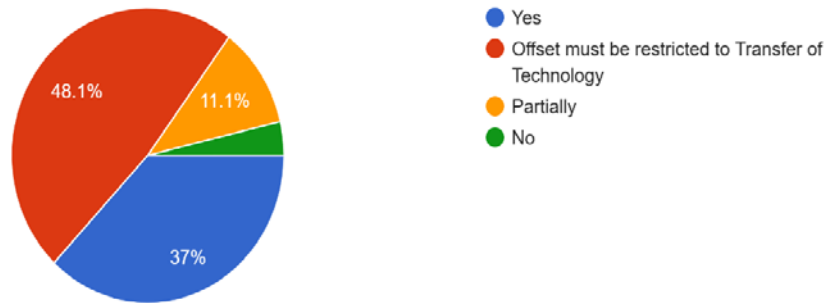
31. Has the Srijan initiative of the government had a positive effect on Atmanirbhar Bharat Abhiyan?

57 responses



32. Is removal of Offset obligations from Inter-Governmental Agreements (IGA) and Foreign Military Sales by the government is a step in the right direction? (Select one response)

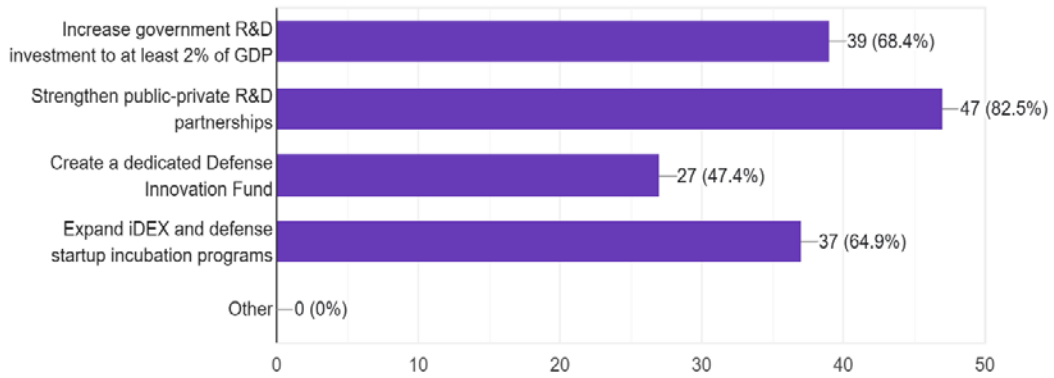
54 responses



### Section 5: Research & Development and Technology Indigenization

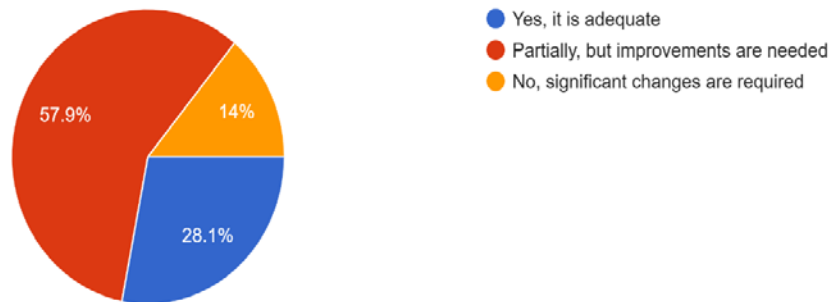
33. India spends only 0.9% of GDP on defence R&D, compared to China (2.2%) and Israel (4.9%). How should India increase indigenous defence R&D? (Multiple Choice – Select up to 3 answers)

57 responses



34. Do you believe that the iDEX initiative has been a game-changer? (Select one answer)

57 responses



35. What more needs to be done to make iDEX more effective? (*Short answer*)

**Ans**

### **Key Areas for Improvement in iDEX**

#### **1. Increased Funding & Investment**

- Need for larger grant sizes to ensure that startups and MSMEs can sustain R&D.
- Increased government funding for niche technology projects.
- Establish revenue models to ensure the financial sustainability of innovations beyond iDEX funding.

#### **2. Process Optimization & Faster Execution**

- Avoid procedural delays and bureaucratic hurdles that slow down innovation absorption.
- Refine the organization and screening process to select startups with high-impact potential.
- Streamline approval mechanisms for faster scaling and commercialization.

#### **3. Greater Participation & Industry Collaboration**

- Encourage participation from academia and research institutions (IITs, NITs, universities).

- Expand private sector involvement through venture capital and corporate funding partnerships.
- Reduce MoD interference and provide autonomy to startups for faster decision-making.

#### **4. Market Access & Commercialization**

- Larger contract sizes to make iDEX commercially viable.
- Provide Minimum Order Quantity (MOQ) commitments to ensure post-development sustainability.
- Offer incentives such as credit systems for startups to gain eligibility for other government projects.

#### **5. Recognition & Awareness**

- Greater visibility and promotion of successful iDEX innovations to attract more startups.
- Recognition, rewards, and inclusion in other government initiatives.
- Improve outreach efforts to defence stakeholders and private industry.

#### **6. Strategic Focus on Innovation Areas**

- Ensure that iDEX focuses on real operational challenges rather than just creating a long list of projects.
- Increase investments in R&D-heavy sectors like AI, quantum computing, and metallurgy.
- Greater scrutiny of projects to align them with futuristic defense requirements.

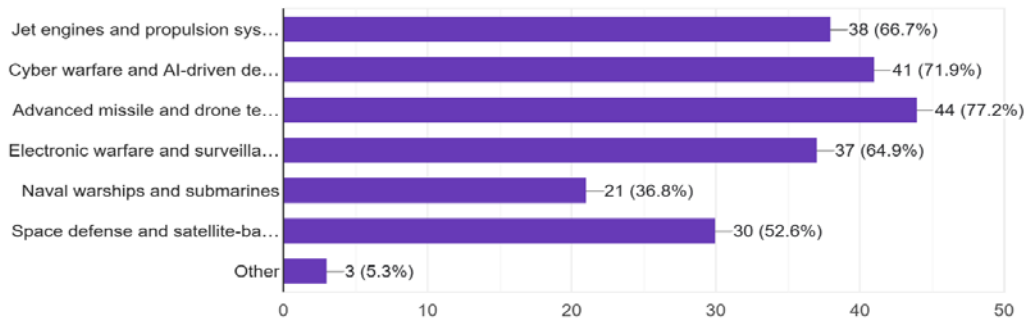
#### **7. Integration with Existing Defence Procurement**

- Orders must be placed with innovators rather than just offering funding.

- Technology absorption through single-window clearance for rapid procurement.
- Treat iDEX as an R&D project rather than a capital procurement case.

36. What areas of defence technology should India prioritise for domestic development? (Multiple Choice – Select upto 3)

57 responses



## Section 6: Future Strategy and Policy Recommendations

37. What specific policies or structural changes would you recommend to strengthen India's defence self-reliance? (*Short answer*)

**Ans**

### 1. Enhancing Research & Development (R&D)

- Increased investment in R&D to drive indigenous defense capabilities.
- Reverse engineering and technology adaptation, following the China model.
- Continuous R&D throughout the lifecycle of defence equipment to ensure technological upgrades.
- Encouragement of academia and startups via a Defense Innovation Fund focusing on AI, quantum computing, and hypersonic missiles.

- Public-private collaboration in R&D, including technology transfer agreements.

## **2. Policy Reforms and Structural Changes**

- Regular updates to DAP & DPM to reflect changing defence requirements.
- Restructuring of defence organizations:
- Reduce reliance on DPSUs and encourage private sector participation.
- Hand over DPSUs to the Ministry of Heavy Industries.
- Revamp DRDO and focus on critical technologies.
- Move CEMILAC and DGAQA under the DMA or DGCA for better quality control.
- Reform Defence Finance & DGQA to reduce bureaucratic delays.
- Create a dedicated defence procurement and acquisition agency to handle procurement cases from initiation to delivery.
- Introduce a more comprehensive single policy instead of multiple fragmented ones.

## **3. Procurement Reforms & Acquisition Modernization**

- Replace the L1 system with a T1L1 model (where technical competence is as important as cost).
- Stricter quality control (QA & QC) standards on DRDO, HAL, and DPSUs.
- Faster and more efficient acquisition process, with penalties for project delays.

- Encourage direct participation of MSMEs and private firms in major defence projects.

#### **4. Private Sector Participation & Industry Collaboration**

- Encourage public-private partnerships (PPP) and MSME participation in defence production.
- Boost local industries by reducing DPSU monopoly and improving collaboration between startups, IITs, IISc, and private players.
- Greater financial incentives for private defense manufacturers to ensure long-term commitment.
- Introduce measures to absorb cutting-edge technology from foreign partners.

#### **5. Strengthening Domestic Capabilities**

- Reduce dependency on imported metallurgy and critical components.
- Balance between numbers and quality, ensuring that modern technology is prioritized.
- Introduce accountability for defence manufacturing delays at DPSUs, DRDO, and HAL.

#### **6. Holistic Approach to Defence Self-Reliance**

- Create a dedicated defence self-reliance authority reporting directly to the Defence Minister.
- Develop a competency map for Indian defence industries to identify gaps in production capabilities.
- Ensure greater involvement of armed forces in decision-making at all levels

**38. What lessons can India learn from countries like China, Israel and South Korea in achieving defence self-sufficiency? (Short answer)**

**Ans**

**China's Model:**

- **Military-Civil Fusion:** Integrated collaboration between the military, academia, and industry.
- **Reverse Engineering:** China has rapidly copied and improved upon foreign military tech.
- **Large-Scale Investment:** Heavy government funding in R&D and manufacturing capacity.

**Israel's Model:**

- **Focus on High-Tech Innovation:** Strong reliance on AI, cybersecurity, UAVs, and missile defense systems.
- **Export-Oriented Defense Strategy:** Israel actively promotes defense exports to sustain domestic production.

**South Korea's Model:**

- **Public-Private Collaboration:** Encourages PPP models in defense production.
- **Skill Development:** Strong emphasis on technical education to support the defense sector.
- **Strategic Partnerships with Global Defense Leaders:** South Korea has successfully integrated its defense firms into global supply chains.

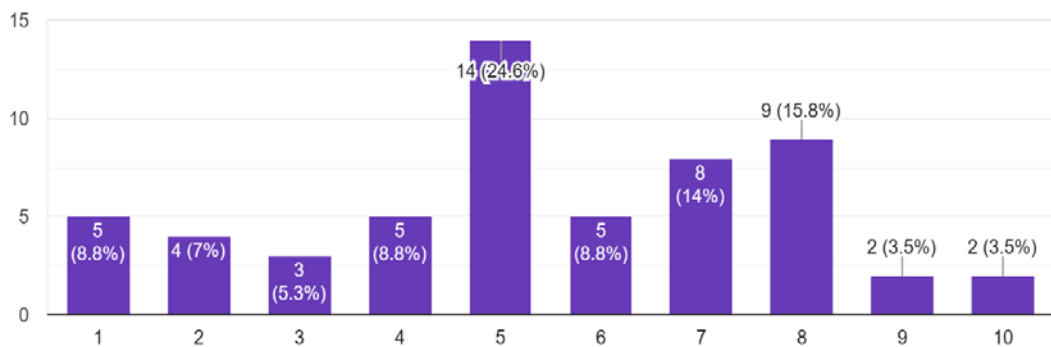
**General Lessons for India:**

- Reduce bureaucratic delays in decision-making.
- Increase funding for private sector innovation and research.

- Prioritize indigenous defense capabilities over partnerships with foreign OEMs.
- Incentivize defense exports for sustainability.
- Improve the accountability of DPSUs and DRDO to ensure timely project completion.

39. On a scale of 1-10, how confident are you that India will achieve full defence self-reliance by 2035? (Linear Scale: 1 = Not Confident, 10 = Extremely Confident)

57 responses



**40. Any additional comments, suggestions, recommendations or insights you would like to share on the subject? (Optional – Short Answer)**

**Ans**

### **1. Policy Revision & Governance**

- Policies should be revised at regular intervals with a clear national character to ensure adaptability and effectiveness.
- The political landscape may influence the long-term success of defence self-reliance initiatives.

### **2. National Approach to Defence**

- India should actively promote itself as a proactive defence state.

- Greater citizen accountability and public participation in national defence should be encouraged.

### 3. Encouraging Competitive Market & Innovation

- Indian defence products should compete at a global level rather than being limited by domestic preferences.
- Preferential treatment to MoD entities should be withdrawn to ensure a level playing field for private and public enterprises.
- Greater collaboration and innovation between MoD, private players, and research institutions is needed.

### 4. Issues in Defence Ecosystem

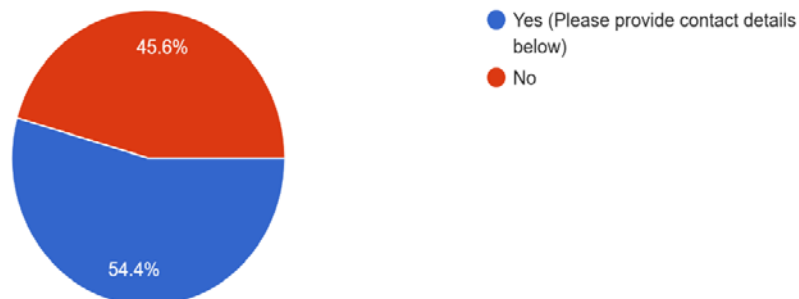
- Concerns over lack of due diligence, weak quality control, and work ethics in the Indian defence sector.
- Need for skilled, trained, and exposed professionals with learning agility to prevent stagnation.

### 5. Avoiding Political Influence

- The defence sector should remain apolitical, and politicization of defence policies should be avoided to maintain focus on strategic goals.

41. Would you be willing to participate in a follow-up discussion or provide further insights? (Select one answer)

57 responses



**42. If yes, please provide your name and preferred contact details (email/phone number)**

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