‘ATMA NIRBHARTA’ THROUGH INDIGENISATION: A STUDY OF MANUFACTURING AND PROCUREMENT POLICY IN DEFENCE SECTOR

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CERTIFICATE

I have the pleasure to certify that **Air Commodore Sandeep kumar VSM** has pursued his research work and prepared this dissertation titled **'ATMA NIRBHARTA' THROUGH INDIGENISATION : A STUDY OF MANUFACTURING AND PROCUREMENT POLICY IN DEFENCE SECTOR** under my guidance and supervision. The dissertation is the result of his individual research and to my best of my knowledge and belief, no part of it has earlier comprised any other monograph, dissertation or book. This is being submitted to the Punjab University, Chandigarh, for the award of **Master of philosophy** in social sciences in partial fulfillment of the requirement for the Advanced Professional Programme in Public Administration (APPPA) (2022-23).

I recommend that the dissertation of **Air Commodore Sandeep kumar VSM** is worthy of consideration for the award of **M Phil** of Punjab University.

Dated: Mar 2023 **(Dr. Saket Bihari)**
Dissertation Guide

Place: New Delhi **IIPA, New Delhi**

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At personal level, an opportunity to work on issues pertaining to 'Atma nirbharta' through indigenisation, study of manufacturing and procurement policy in the defence sector was of immense learning value. This work helped me to understand the dynamics of Defence manufacturing sector in India and the odds against which the indigenization has to progress in the country.

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Air Cmde Sandeep Kumar VSM

LIST OF ABBREVIATIONS

Abbreviations	Expansion
AAP	Annual Acquisition Plan
ALH	Advanced Light Helicopter
ASW	Anti-submarine warfare
BDL	Bharat Dynamics Limited
BEL	Bharat Electronics Limited
BEML	Bharat Earth Movers Ltd
CAGR	Compound Average Growth Rate
CNC	Commercial Negotiation Committee
CSDO	Central Servicing and Development Organisation
DAC	Defence Acquisition Council
DGAQA	Directorate General of Aeronautical Quality Assurance
DGQA	Directorate General of Quality Assurance
DPB	Defence Procurement Board
DPP	Defence Procurement Procedure
DPSU	Defence Public Sector Undertaking
DRDO	Defence Research and Development Organisation
EADS	European Aeronautic Defence and Space Company
ESO	Engineering Services Outsourced
FDI	Foreign Direct Investment
FGFA	Fifth Generation Fighter Aircraft
FIPB	Foreign Investment Promotion Board
FTP	Fast Track Procedure
GDP	Gross Domestic Product

HAL	Hindustan Aeronautics Limited
IAF	Indian Air force
JV	Joint venture
MOD	Ministry of Defence
MRO	Maintenance Repair and Overhaul
OEM	Original Equipment Manufacturers
OFB	Ordnance Factory Board
PSU	Public Sector Unit
SCAP	Services Capital Acquisition Plan
SHQ	Service Headquarters
SME	Small and medium enterprises
SQR	Services Qualitative Requirements
TEC	Technical Evaluation Committee
UAC	United Aircraft Corporation
UAV	Unmanned Aerial Vehicle

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ABSTRACT

India is one of the largest arms' importers in the world. Self-reliance in the defence sector is the most important constituent of Atma nirbhar Abhiyan. In spite of several initiatives undertaken by the government, self-reliance in defence production has not been achieved. The study has been carried out to understand and analyse the existing policies mainly DAP 2020, offset guidelines, Defence Procurement Manual, 2009, Indigenisation Policy IAF, Design, Development and Production of Military Air Systems and Airborne Stores, Defence Production and Export Promotion Policy 2020 and Joint Venture Guidelines with an aim to identify constraints in policies for defence manufacturing and procurement, understand the applicability of 'Atma Nirbhar Abhiyan' for defence manufacturing and procurement. Effectiveness of the existing policies, guidelines for the manufacture and procurement of defence equipment and acquisition of niche technologies have also been analysed and actionable measures have been recommended to foster 'Atam Nirbhar Abhiyan' in defence sector. The study has been undertaken with a mixed method approach. Both quantitative and qualitative data points have been garnered from primary and secondary sources. The study of the policies have been carried out in coordination with all stakeholders i.e. service HQs, MoD, DRDO, DGAQA and defence industry. Based on the analysis, suggestions have been made for improvements /changes in the existing policies for manufacture and procurement, measures required to attract the OEMs through FDI for harnessing niche technologies, creation of a robust vibrant ecosystem for private industries, start-ups and large-cap industries to proactively participate in the Atma nirbhar Abhiyan.

CHAPTER : I

INTRODUCTION

Chapter-I

Introduction

The work "Atma Nirbharta through Indigenisation: A Study of Manufacturing and Procurement Policy in Defence Sector" has been conducted keeping in view the self-reliant trajectory advocated in the area of defence, on the one hand, and continuous update in manufacturing and procurement policy, on the other. The study with a subtle framework estimated the obvious issues and possibilities that need to be considered in order to be self-reliant in the defence sector. Based on the secondary literature review, the study traces signposts to resurrect the resource-base instruments in realising 'Atma Nirbharta' in defence sector.

This is highly relevant from the point of view of India, a country which is one of the largest arms' importers in the world and surrounded by hostile neighbours like Pakistan and China. Self-reliance in the defence sector is the most important constituent of Atma nirbhar Abhiyan. In spite of several initiatives undertaken by the government, self-reliance in defence production has not been achieved. In the past also various studies have been carried out, however there is a need to undertake a study with fresh outlook, taking into consideration contemporary issues and challenges in achieving 'ATMA NIRBHARTA' in defence sector. The objective of the study is to understand and analyse the existing policies mainly DAP 2020, offset guidelines, Defence Procurement Manual, 2009, Indigenisation Policy IAF, Design, Development and Production of Military Air Systems and Airborne Stores, Defence Production and Export Promotion Policy 2020 and Joint Venture Guidelines with an aim to identify constraints in policies for defence manufacturing and procurement, understand the applicability of 'Atma Nirbhar Abhiyan' for defence manufacturing and procurement. Effectiveness of the existing policies, guidelines for the manufacture and procurement of defence equipment and acquisition of niche technologies have also been analysed and actionable measures have been recommended to foster 'Atma Nirbhar Abhiyan' in defence sector. The study has been undertaken with a mixed method approach. Both quantitative and qualitative data points have been garnered from primary and secondary sources. The objectives for the study are enumerated below:

- Study the reasons for slow pace of indigenisation in defence manufacturing.

- Identify constraints in policies for defence manufacturing and procurement.

- Understand the applicability of 'Atma Nirbhar Abhiyan' for defence manufacturing and procurement.

- Recommend actionable measures to meet the exigencies, fostering 'Atma Nirbhar Abhiyan' in defence sector.

For any nation, economic strength is the main aim, however, this cannot be achieved without self-reliance in defence capabilities. Indian industry has the potential and capability to support IAF in its Indigenisation programme. In the recent past, Govt. of India has introduced a number of measures to enhance the participation of Indian industry in Defence Production. Procedures have been put in place to give impetus for MSMEs and Start-ups to enter into Defence manufacturing and timely induction of equipment into Indian Armed Forces. However, self-reliance in defence manufacturing has not been achieved to the desired levels.

Continuous upgradation of Military capabilities is a must for country like India to become economically stronger since the country is surrounded by not-so-friendly neighbours. In order to deal effectively with such a security situation India needs to have defence forces equipped with the latest technology and weapon systems. As India aspires to become a super power, it is essential to have strong aerospace capabilities, preferably indigenously manufactured. Acquisitions of defence systems, production of defence equipment and doctrines of warfare are carried out in accordance with strategic defence and foreign policy environments. This has a bearing on the Indigenisation of Military Aviation towards Make in India.

Evolution

Pre Independence

During colonial times, small mills within the fortifications at Mumbai, Chennai and Kolkata were set up to make gunpowder as the hardware could be brought over from the mother country. Cossipore (Kashipur) Factory which commenced production in March 1802[1], is recognised as India's first Ordnance Factory. Its present name was given in 1872 to mark the completion of the new rifle shell factory in its extended premises. After setting up this factory, the policy of procuring most critical hardware from England continued. Production of hardware at Cossipore was found to be at least fifty percent more expensive than Woolwich. It was also stated that locally made defence products were lacking in quality and there was no machinery or scientific skills available. This position was further strengthened by the industrial policy of 1956. This policy had a profound effect on our military equipment production, as number of state-of-the-art equipment continues to be imported till date.

Post-Independence

After the independence, India's strategic policy in the initial years, was to maintain good relations with neighbours and not by proactively arming itself. Prominence was accorded to the public sector, and accordingly, Ordnance manufactures were kept away from the private sector from, which were reserved for the public sector. A major portion of defence equipment was being imported, with seemingly ideological bias against Indian private industry. However, the changed security scenario with china (clash in 1962) and Pakistan (Ayub Khan's military coup in 1958) and the supply of sophisticated US arms into Pakistan led to a change in thought process. Prof P.M.S Blacketts' recommendations led to the establishment of the Defence Research and Development Organisation (DRDO)[2]. Several deficiencies in production infrastructure were brought out by the US management firm of Arthur D. Little which resulted in the setting up of the Department of Defence Production. However, the 'Supply' part was mainly to assist the Public Sector and the Services part

[1] https://ddpdoo.gov.in/pages/history
[2] Report by Richa Tokas,(2021) Research Intern, Defence Economics & Industry Centre, MP-IDSA

to source low-value, unsophisticated stores or perhaps outsource some components or processes to the private industries.

India's geographical location and strategic policies led to its inclination towards the erstwhile USSR for its defence equipment. An lndo-Soviet Treaty of Peace, Friendship and Cooperation was signed in 1971. As per the treaty, the methodology followed was to carry out negotiations with one state Agency and sign Government to Government agreements. Indigenous production was undertaken through licensed production contracts. This further strengthened the production base of Indian public sector. There was limited Technology transfer and did not lead to the development of design capabilities. As compared to multivendor negotiations which take considerable time, the advantage of the one-vendor system was that more time was available to discuss issues relating to production technology, absorption infrastructure, manpower and related skills. The relations between India and Russia were not affected by turbulent 1980s.

India followed the strategy of buying robust platforms from Russia and customizing them with western and India-sourced items. This resulted in a vast array of equipment for all three Services. The period up to the early 90s was mainly consolidation of partnership with Russia, which resulted in very high dependency on Russia for production of defence equipment and Repair and overhaul. India became an arms import-dependent country.

The 1990s saw a resurgence of our economy and changes in the economic order. The liberalisation and deregulation process was accelerated due to critical issues faced by the economy. Further, the manufacture of defence equipment was opened to the private sector in 2001-02. A number of agreements were signed with different countries for purchase, manufacture, Transfer of Technology, research and development with respect to defence equipment. Although there were issues faced like protracted negotiations with number of vendors instead of a single vendor in Government to Government negotiations, they were efficiently handled by the Government and Military supplies from various countries commenced with the conclusion of number of long-term partnership agreements.

Further, the buyer-seller relationship followed by India till now shifted very deliberately to working together for production, development and research and

development. More complex and latest technology was sought from these countries, along with design technology to ensure any up gradations at a later stage in case required to suit Indian requirements. The concepts of a long-term perspective plan, Services five-year capital acquisition plan and 'Make' and 'Buy' decisions were adopted. Post-Kargil war, number of reforms in the Defence acquisition procedures were undertaken with an emphasis on jointness, synergy, strengthening of institutional mechanisms, expertise and collegiate decision-making. Medium-term and annual plans were to be formulated based on long-term planning prepared by an Integrated Defence Staff reporting to the Chiefs of Staff Committee with approval by the Defence Acquisition Council (DAC) chaired by the Defence Minister. Emergency purchases were to be effected by the Defence Procurement Board (DPB) chaired by the Defence Secretary.

A new acquisition procedure was formulated, under a Director General of Defence Acquisition (earlier Special Secretary, Acquisition) comprising members from all stakeholders. The DPP was initially issued in 2002 and revised at regular intervals (latest revision issued in 2020) enhancing the scope to include the 'Make' procedure and 'Buy and Make (Indian)' categories and upgrades. Offsets were made mandatory for high-value projects since 2005.

Indigenisation was emphasised through Defence Production Policy issued in 2011. There have been continuous improvements in the DPP since 2002 for indigenisation. With these revisions, foreign procurement can take place only after the other options for procurement, namely, Buy (Indian), Buy and Make (Indian), Make, Buy and Make with Transfer of Technology (TOT) are exhausted. 'The Technology Perspective and Capability Road map TPCR - 2013' was promulgated by HQ IDS. India is now set for a revolution with renewed vigour exhorted by our Hon'ble PM with 'Make in India' call. The security scenario remains tense with a two-front threat from the Northern and Western land borders coupled with the threats of cyber and space warfare. The trajectory of the economy is expected to bestow India with self-confidence in the efforts to maintain an element of deterrence for the maintenance of the security of the region.

Presently, Indian Air Force operates variety of aircraft, transport, helicopters and UAVs. In the last three decades, although there have been some contributions from the scientific community mainly CSIR (Council of Scientific and Industrial

Research), DRDO and ISRO towards the nation building, but to a large extent Indian armed forces have to depend on foreign sources for military requirements. India still lags behind developed countries with respect to science and technology.

Development of India's defence industry is still below the desired level. Indian military aviation sector is mainly driven by Hindustan Aeronautics Limited (HAL). HAL is associated with all stages of aircraft manufacturing from design, production, repair, overhaul of aircraft and engines, materials and systems. Even with decades of experience in manufacturing number of aircraft and a goof supplier base all over India, HAL has not been able to support the modernisation requirements of IAF. According to the Stockholm International Peace Research Institute (SIPRI)[3], India was the largest importer of weapons in the world in 2022-2023.

In recent years, the private sector has played a significant role in the indigenization of defence equipment. The Indian government has been promoting the participation of private companies in the defence sector through various policy measures such as increasing the Foreign Direct Investment (FDI) limit, streamlining the procurement process, and encouraging public-private partnerships. Private companies have taken advantage of these policies to invest in research and development, production, and marketing of defence equipment. They have also entered into joint ventures with foreign defence companies to transfer technology and improve their capabilities.

The contribution of the private sector has resulted in the development of indigenous technologies and the reduction of India's dependence on imports for its defence needs. However, the private sector's contribution to the overall defence production in India is still limited, and government-owned defence companies continue to dominate the sector. The private sector is estimated to contribute around 25-30% of the total defence production in India. This percentage is expected to grow in the coming years as the Indian government continues to promote the private sector's participation in the defence sector, and private companies invest in research and development and manufacturing capabilities.

[3] SIPRI year book 2022

Statement of Problem

In the recent past, Govt. of India has introduced a number of measures to enhance the participation of Indian industry in Defence Production. Procedures have been put in place to give impetus for MSMEs and Start-ups to enter into Defence manufacturing and timely induction of equipment into Indian Armed Forces. However, a big challenge remains in the simplified implementation of the policies and proper interpretation of these policies at various levels including IFAs.

Inspite of various reforms/ initiatives by the government till date, the stated goal of achieving self-reliance in defence production has not been achieved. Having missed out on any major acquisitions in the last two decades, if there is no sincere efforts from the policy reforms and procedural changes we may land up again in heavy dependence on foreign sources, and undermine our goal of achieving self-reliance. The call given by our Hon'ble Prime Minister to call FDI as First Develop in India than Foreign Direct Investment needs to be made true then there is a need to re-look at our policies towards encouraging indigenisation in India and encouraging the private players to take up the cause. Despite several initiatives undertaken by the government, self-reliance in defence production has not been achieved. There is an urgent need to simplify our policy and procedures enumerated in our procurement, finance and certification manuals for indigenisation to achieve our goal for self-reliance.

All defence procurements should operate within a common conceptual framework. Indian defence services must treat the industry as partners rather than vendors. DPSUs are plagued by issues like inefficiency, desired quality and lack of competition.

Therefore, there is a need to study the constraints and how effective and user friendly are the existing policies DPP, DPM, Policies of HAL and IAF, procedures and guidelines for the manufacture and procurement of defence equipment and acquisition of niche technologies. What are improvements /changes in policies for

defence manufacturing and procurement, attract the OEMs through FDI for harnessing niche technologies, create a robust vibrant ecosystem for private industries, start-ups, and large-cap industries to proactively participate in the Atma nirbhar Abhiyan?

Purpose or Objective

The MoD has also released four positive indigenisation lists so far. Defence Indigenisation Committee (DIC) has been constituted to oversee the formulation and implementation of Positive Indigenisation Lists and to give further thrust to indigenous development and manufacturing. One of the functions of DIC is to explore and encourage the inclusion of MRO hubs in "Positive Indigenisation Lists" to reduce the life cycle costs of Weapons/ Platforms/ Equipment. From the facts stated above, it appears that India has achieved a lot with respect to 'Atmanirbhar Bharat'. However, there is still a lot to be achieved. Following points are enumerated below for appreciation of present status:

(a) Defence industry is quite short of the target of INR 1,75000 Crs including export target of 35000 Crs by 2025 as enunciated in the DPEPP 2020.

(b) Total value of defence exports for FY 2019-20 was INR 9115.55 Crs while the same for 2020-21 was INR 8434.84 Crs[4]. However, it caught up in FY 2021-22 to INR 11,607 Crs.

(c) The orders and output of private industry is still not comparable with the public sector. 58% of the capital procurement budget was allotted for FY 2021-22 to the private industry, however, the realised percentage was much less. Recently Government has made an announcement for allocation of 68% (INR 84,598 Crs) of the capital procurement budget to the domestic industry in FY 2022-23[5].

(d) There is a major issue with Make II projects with respect to funds. Startups, MSMEs and small industries are facing a lot of finance issues in the

[4]https://www.financialexpress.com/defence/indias-defence-exports-since-2014-15-estimated-at-rs-38500-crore/2304630/05 August 2021.

[5]IANS,.https://www.business-standard.com/budget/article/budget-2022-68-capex-for-defence-set-aside-for-domestic-procurement-01 February 2022

Projects of Make II category in which 100% of funds have to be spent from their own resources as compared to Make I. Hence this is one area which needs attention from the Government. This could be in the form of subsidies or interest-free loans etc[6].

(e) The guidelines for the Framework of Simulators in the Armed Forces have been issued in September 2021. However, there are no follow-up actions by the agencies responsible. Seven corporate entities in place of ordinance factories have been dedicated to the nation (Munitions India Ltd, Armoured Vehicles Nigam Ltd, Advanced Weapons and Equipment India Ltd, Yantra India Ltd, Troop Comforts Ltd, India Optel Ltd and Gliders India Ltd). The results/efficacy of this action will be visible only after few years whether it has made the system more efficient or it is old wine in new bottle.[7]

Objectives

Keeping in view the above concerns, the following objectives have been set up for the study:

1. To study the reasons for slow pace of indigenisation in defence manufacturing,
2. To identify constraints in policies for defence manufacturing and procurement,
3. To understand the applicability of 'Atma Nirbhar Abhiyan' for defence manufacturing and procurement, and
4. To recommend actionable measures to meet the exigencies, fostering 'Atma Nirbhar Abhiyan' in defence sector.

[6] "Make in India Defence". Available at www.makeinindiadefence.gov.in.

[7] Bhaswar Kumar, "OFB Corporatisation Alone Won't Make India Atmanirbhar in Defence", Business Standard, 15 October 2021. https://www.business-standard.com/article/economy-policy/ofb-corporatisation-alone-won-t-make-india-more-atmanirbhar-in-defence-.

CHAPTER: II

REVIEW OF SECONDARY LITERATURE

Chapter-II

Review of Literature

Indigenization-key to self-sufficiency and strategic capability

This is a book published in 2016 by the Centre for Air Power Studies edited by Brigadier Ranjit Ghosh. This book in its introductory chapter reviews the evolution and current realities of the Indian defence industry to arrive at the objective and scope of the research work. In the second chapter, the book reviews the journey of the Indian Defence Industry. Further, the author reviews two fast-growing countries with respect to defence industry Israel and South Korea to glean important takeaways for India. This is followed by analysing the international industrial practices adopted by two leading military powers US and China .Such an analysis further brings out valuable defence industry experiences and vital lessons for defence planners. The author in the concluding chapter suggests three plausible options for remodelling the Indian defence industry and indigenization programme, discusses the most pragmatic option and the resultant feasible model in detail, recommends the way ahead for India before suggesting an action plan for make in India in the defence sector.

The public sector perceives Make in India programme to be a capability-building exercise while private sector envisages it to be an opportune time to forge tie-ups with foreign OEMs to bring cutting-edge technology to India. Therefore, there is a need to adopt a result-oriented and graduated approach for the private sector to achieve compete self-reliance in defence sector. The author suggests three phases for induction of a private vendor i.e. initial induction phase in which designated private industry could initially be made execute a sub-system level upgrade programme on an allocated weapon system. This will be followed by an interim induction phase in which designated private industry could next be made to execute a major system-level upgrade program on an in-service weapon platform. Lastly, the final induction phase in which designated private industry could graduate to undertake the performance optimization for an in-service variant of the specific major weapon system it has been designated for. The author finally recommends appointing an apex-level body comprising domain experts, which will be solely responsible for Make in India initiative for defence sector.

Technology Perspective and Capability Road Map (TPCR) 2018

The first document was published in 2013. Since then a number of inputs/recommendations have been received from manufacturers and business houses to make the document more informative for potential manufacturers. TPCR 2018 was released by MoD in 2018 to provide industry requirements for armed forces till late 2020s.The revised TPCR comprise 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.

This publication aims to give the sector a broad overview of the capabilities that the Armed Forces plan to develop over the next 15 years, which will in turn drive the development of new technology. The TPCR is openly accessible and released by the Ministry of Defence. This publication 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. This document is issued with the intention that the industry would interact with the Ministry and forces regularly so that they can strike a partnership for developing contemporary and future technologies and further, manufacturing the required equipment.

There should be a major push in the field of research and development if modern or superior technologies are to be developed (R&D). The MoD anticipates that both private and public R&D organisations will be able to create comprehensive plans to develop such technologies after consulting this document. Utilising all the resources the nation has to offer in terms of the civilian industry, university, and government institutions and divisions should also help in establishing budgets for R&D and funding such projects.

Over-reliance on imported hardware has the potential to compromise a country’s defence preparedness in times of crisis, through the imposition of various technology denial regimes by the supplier. The chapter on technology requirements of the Indian Armed Forces lists twenty-two technologies, which cover technologies for digital systems, Sensors, SAGW, Stealth, space-based radars, Adaptive antenna signatures battle field transparency to sensor fusion, land ware and maritime domain

and many technologies specific to Military Aviation sector. The chapter on capability requirements brings out a very detailed current and future desired capabilities required by the Indian Armed Forces, over 15 years.

In terms of network-centric operations, information technology upgrades, and combat field management technologies, it highlights the requirements of all three services. It highlights the need for fighters, transport, and helicopters specifically in aviation. Under Fighter, it anticipates the need for more modern, multi-role combat aircraft to replace the current fleet. The roadmap is presented in the document with a combination of modernised and cutting-edge modern combat aircraft. The need for medium-lift aircraft to bridge the gap between LTA and HETAC is highlighted under the heading of transport aircraft. It expresses the need for aviation to have certain capabilities to assist the overall defence strategy.

HQ IDS has taken steps to develop effective communication between all parties involved through a variety of fora, seminars, etc. As part of this endeavour, the industry is frequently asked to describe its ability and desire to take on projects before internal debates during meetings of the Services Capital Acquisition Plan Coordination Committee (SCAPCC). This document is a welcome development however, it does not address difficulties which may come in the way of achieving the underlying objective. The foremost question is that whatever information given in this document is enough and serves the purpose of the industry. Industry may always feel that it is falling short of their expectations. There are reasons for this feeling, mainly the information given in most of the part is too generic. Any industry would like to draw up their plans based on the numbers, but it gives no indications of this anywhere in the document and last but not least there is ambiguity in the time frames. It is difficult for the Armed forces to firm up their futuristic requirements and even cannot be disclosed in much detail, but the information given in TPCR is far below the line that separates ambiguity and specificity.

The main reason that undermines the usage of the TPCR is its silence or open-ended timeframes. The other few factors which suggest that the TPCR could possibly fall short of the expectation are its lack of focus on upgradation and life extensions, which falls in the indigenisation gambit. It does not also talk of maintenance, repair and overhaul activities which is a major indigenous industry. Another short coming in the

document is its lack of clarity about the financial viability of the R&D projects. One cannot deny that it requires major investments. It may not be the scope of TPCR but it does not bring clarity between investments and the market. TPCR is falling short in terms of not bringing clarity on what is reserved for the public sector and what will be offered to the private sector. The private sector may not be very enthusiastic about undertaking projects which in their opinion can be handed over to the public sector. However, TPCR on a whole gives a fair idea for the industry in what is expected and where is it going about military aviation.

Atmanirbharta in Defence: How has been the Journey So Far? Where are we Headed?

This is an article published in Centre for Land Warfare Studies (CLAWS), issue brief no 339 by Lieutenant General (Dr.) VK Saxena, PVSM, AVSM, VSM (Retd) in May 2022. The author has brought out that today the 'twin initiatives' of the Government — Make in India and Atmanirbhar Bharat, have come to occupy a position wherein they are seen as 'prime-movers' that sets the pace of the country's forward journey on the road to self-reliance - be it defence or civil sector. The journey to the current status has been full of challenges with many successes and many failures dotting the way. The present work traces this exciting journey and brings out updates about the current state of reality and suggests a likely way forward. The Centre for Land Warfare Studies (CLAWS), New Delhi, is an independent Think Tank dealing with national security and conceptual aspects of land warfare, including conventional & sub-conventional conflict and terrorism.

Indian Air Force: Case for indigenisation by Air commodore Jasjit Singh AVSM,VrC,VM. 'Indian Air Force: The Case for Indigenisation'

This is a book published in 2013 by the Centre for Air Power Studies edited by Air Commodore Jasjit Singh AVSM,VrC,VM. The author has traced the evolution of the Aircraft Industry in India from the pre-independence era till 2013. The research method used is Qualitative (Explanatory design-analysis of data & case studies). The author has made recommendations for the reorganisation of ADA with suggestions to place under Air Hq, emphasis on Research and development-and nurturing of designers. In this book, he discussed the case of the Aircraft Industry, wherein he started with the pre-independence era and he starts with the setup of the aircraft industry in

1939. The book brings out that India has been forced to import almost all types of complete aircraft from foreign sources. A small degree of self-reliance was achieved by the licensed manufacturer of some of the aircraft. But the high technology systems and components for these also were imported. It is pertinent to note that before independence, the country had a very poor industrial set up. The Britishers did not set up any industry in the countries they ruled and focussed on developing their industries with raw materials from these countries. The author has further stated that from our point of view of indigenisation of military weapons especially aircraft, sub systems and other associated equipment, India has lagged due to emphasis on "cutting edge" technologies. The author has brought out that our focus has been more on the theoretical rather than the practical application. The book has brought out that raw materials like cotton, iron ore etc., were sent to textile mills in England. Further, the author has sought introspection for our failure to achieve self-reliance in defence sector due to various circumstances in the last century.

The book then goes on to say that HAL (Hindustan Aeronautics Limited), after independence, started with three main objectives. Firstly, indigenous design and development, which may be with foreign collaboration. Secondly, licensed production of aircraft and associated equipment. Thirdly, direct import of urgent and high-technology aircraft and systems to meet operational requirements, with licensed manufacture of aircraft required.

The author brought out the situation in which India became dependent on the Soviet Union for the supply of military equipment. He mentions that suitable plants were set up by HAL for the licensed manufacture of Soviet-designed aircraft and engines at two opposite ends of the country, which led to increased costs and inefficiency. The direct adverse impact of this process was that the licensed manufacture of Soviet aircraft and equipment became the most significant component of the three parallel objectives of HAL. The author further mentions that India finally got associated with the Soviet Union and European Manufacturers (UK and France) for the supply of defence equipment. However, no major advantage was accrued due to the lack of joint ventures and transfer of design data. As a result, the first of the three objectives that are indigenous design and development could not be achieved.

The book recommends that the Indian Navy Model may be adopted, which is the most simple and efficient approach for the indigenisation of defence equipment. The model has been followed by the Indian Navy for the last seven decades. The Navy has Directorate of Naval Design comprising highly qualified technical experts under the Chief of Naval Staff (CNS). The Indian Navy model has been highly successful. It needs to be clarified that the British relied totally on their private industry to design and develop aircraft of all varieties. The author further brought up that there were no major reforms after the Kargil war even after an in-depth review.

The author then went on to analyse the issues with the ADA (DRDO) being the design agency and HAL responsible for production. In the past, there have been serious problems in production using the design. Accordingly, the author opines the merger of ADA with HAL design bureau after the fructification of the technology demonstrator. He further states that ADA should have commenced working on follow -on design project which could have begun to fructify now.

Lastly, the book recommends that ADA be brought under the Air HQ. Alternatively, the book suggests an expansion of ADA to undertake all design and development tasks rather than continuing the ad-hoc programmes. Further, there is a need for synergy between the ADA and HAL for building up so that design- to-production capability.

Make in India: promoting indigenisation

This is a paper published by Dr Parveen Kumar in kurukshetra, feb 2016, vol no 64,issue no 4,Page no 27-30. The author has brought out that the logo of make in India initiative is a lion which represent India's glorious past. The lion is made up of an iron cage which represents the industry. Thereafter the author has stated the vision of make in India initiative comprising of increase in manufacturing, fostering innovation, protecting intellectual property and enhancing skill development. Further it is envisaged that mission make in India is not to be achieved by compromising quality standards. The slogan zero defect was coined by the prime minister which signifies production mechanism where in where in products have no defects and the process through which product is made has zero adverse environmental and ecological effects. The make in India initiative focuses on building physical infrastructure as well as creating a digital network to make India a global hub for manufacturing of goods

ranging from cars to software, satellites to submarines, pharmaceuticals to ports and paper to power. The author has further elaborated various initiatives taken under Make in India programme and their impact on employment, infrastructure, exports and Foreign Direct Investment. Thereafter various success stories have been narrated by the author.

Finally the author has highlighted few concerns like skill development, conducive Labour laws, lethargic bureaucracy, low ranking in ease of doing business, logistic facilities, poor infrastructure, and availability of adequate power and efficient implementation of policies. He has expressed hope that make in India is a ambitious project and is not merely a slogan but a mission to be accomplished by a single minded commitment.

Indigenization in defence industry –current status of future prospects

This is a paper by Shri M V Kotwal published in USI journal, 2012, vol no 141,issue no 589,page no 331-343.The author has deliberated on the present status of indigenization in defence industry. He has stated that India is third largest defence spender after USA and china. The three pathways followed by defence indigenization in India are indigenous technology development, transfer of technology and licensed manufacture. The author has brought out several constraints like increasing imports, need to enhance investment in R&D, production technologies, integration of complex systems and equipment platforms and development of human capital. Young and dynamic talented people must head the project teams for project management.

The author has further discussed defence production policy, defence offset guidelines and brought out issues in their implementation. He deliberated upon conflict of interest at the MoD of balancing between public and private sector. Also there is lack of accountability for building local capabilities, entry barriers for private players, required skill resources for the sector, lack of coordination between R&D institutes and private sector, skill upgradation of the interested private participants and Foreign direct investment in defence industry and lack of an official defence export policy. Delay in issue of defence production licences is another major hindrance in indigenisation in defence sector. The author has further cited various defence models of other countries like USA, UK and South Korea which have organisations comprising of government

officials, military and industry professionals, branches of armed forces, homeland security etc.

Finally the author has given recommendations as incentives to the private industry for providing end to end defence product, need for a dedicated department in MoD which will look after the interest of the private industry engaged in defence production. He has also recommended strict regulation of offset policy and utilization of skilled retired personnel of the Indian armed forces in various programmes and projects thereby enabling the private sector to produce equipment to the expected level of quality and satisfaction of users.

CHAPTER:III

RESEARCH METHODOLOGY

Chapter-III

Research Methodology

Keeping in view the objectives of the study, the research design follows both explanatory and exploratory frameworks. **The study has been undertaken with a mixed method approach. Both quantitative and qualitative data points have been garnered from primary and secondary sources. Quantitative strategy comprised of exploratory design (Interviews and focussed group discussion) and Qualitative strategy comprised of Explanatory design (case studies and document based analysis).** The study of the policies have been carried out in coordination with all stakeholders. The research tools like interview schedule, focus group discussion and observation were used to collect primary data sources. The books, journals, newspaper clippings, Govt. reports and materials available in the e-platforms were used under secondary data sources. As such, the study employed a comprehensive and need based methodological tools to garner relevant information to arrive at precise findings and suggestions. The method of inquiry was interview, study of the existing/published data, Interaction with subject matter experts in Gol, Academic institutions and renowned persons was done to get a varied perspective on this issue. Selected members of HAL, IAF and officials concerned with the indigenisation process were interviewed. Focussed group discussion were carried out with the officials involved with the subject.

Research Questions

After carrying out the literature review and setting the objective of the study, the following main question were answered.

(i) What are improvements /changes required in policies for defence manufacturing and procurement, attract the OEMs through FDI for harnessing niche technologies, create a robust vibrant ecosystem for private industries, start-ups, and large-cap industries to participate in the Atma nirbhar Abhiyan?

(ii) What are various means for meeting the challenges and way ahead for the accomplishment of Atma nirbhar Abhiyan?

(iii) What are the shortcomings of policy on Foreign Direct Investment (FDI) and amendments required for the defence sector?

(iv) What are the improvements required in the policy with respect to Airworthiness certification and quality?

Indigenisation can be seen in two streams, one in completely new design, product and weapon, and other in TOT itself while carrying out licenced production we can start indigenising the major assemblies so that we can reduce our foreign dependency and make us self-reliant. In order to achieve this self-reliance through indigenisation we need to align our policies towards indigenisation which is the main stream of India today.

The study has been carried out to understand and analyse the existing policies mainly, DAP 2020, where the offset clauses are provided for encouraging the indigenous content, Defence Procurement Manual, 2009 (DPM 2009), Indigenisation Policy IAF i.e. Manual of Indigenisation-2017, Design, Development and Production of Military Air Systems and Airborne Stores. (DDPMAS) Version 1.0., Defence Production and Export Promotion Policy 2020 and Joint Venture Guidelines.

Limitations and Delimitations

The major limitation may be an individual perception, endeavour would be to overcome this through collecting data of facts and figures. The study is delimiting itself to only the indigenisation in military aviation only in the defence sector.

CHAPTER-IV

ATMANIRBHAR ABHIYAN AND INDIGENISATION IN DEFENCE SECTOR

Chapter-IV

Introduction

The fast track development of military capabilities of the security threats, Research and development programmes and innovative military technologies, are the main factors behind the defence forces for their continuous growth and development. The defence equipment whether indigenously developed or imported from other nations, is expected to strengthen its military against its potential threats. Further, all developed nations aspire to achieve complete dominance over the entire spectrum of conflict. In order to achieve such state with futuristic defence capability, a nation must achieve self-reliance in development of superior and complex technology defence equipment which should be innovative, out of the box, relevant and capable of continuous up gradation.

After the satisfactory development/procurement of defence equipment by the Services, main issue is operationalization and sustenance of the equipment as per the life assigned. Continuous availability and mission readiness state is highly desirable for the success of the Armed Forces during peace and war. For this purpose, it is essential that the supplier/Original Equipment Manufacturer (OEM) or the Production Agency (PA) provides required sustenance services. This type of methodology was experimented with by India with various nations like Canada, UK, United States of America (USA),but failed and in-house Maintenance, Repair and Overhaul (MRO) agencies were approached to quickly recover the situation. The life cycle support for a typical defence equipment spans from the womb (identification of the need) to the tomb (Final disposal after complete exploitation). It is imperative that this support is rendered by an indigenous and innovative scientific, technological and industrial base.

Indigenisation refers to the capability of a nation with industry comprising of in-house research and development, resources and skill sets providing assistance in production of civil and defence requirements and export business for such products. Indian Government has initiated several reforms in the last 20 years to boost

indigenisation. On June 07, 2021, India's Raksha Mantri (Defence Minister) released an e- booklet listing "20 Achievements of the Ministry of Defence in 2020"[8], which provides details of the steps/policies issues to enhance the indigenous production of defence equipment through innovation and digital transformation. It also highlights the action taken towards Atmanirbharta by galvanising industry, improving exports, defence acquisition and last but not the least accelerating Research and Development with respect to defence industry.

As per report no 25 of the Standing Committee on Defence (SCoD)(2021-22), published Dec 21, during the last four financial years (2016-17 to 2019-20), Out of total 213 contracts, 90 contracts worth about Rs.1,76,569.10 crore have been signed with foreign vendors including USA, Russia, Israel, France, etc. for procurement of Defence equipment for Armed forces[9]. The Defence equipment imported during this period includes helicopters, aircrafts, missiles, rifles, artillery guns, simulators and ammunition[10]. Same report also states that during the year 2020-21 (upto 21.01.2021), total expenditure on foreign contracts under capital Acquisition budget for the Defence Forces has come down from Rs 31058.34 crore to 24384.63 crore and domestic procurement enhanced for FY 2021-22 i.e. 64.09% of the total procurement i.e. Rs 71438.36 Crore.

While the Indian industry has developed few equipment with the assistance of Original equipment manufacturers, it still lacks the capability to indigenously design and manufacture major platforms especially critical components.

[8] Ministry of Defence. June 07, 2021. https://www.mod.gov.in/sites/default/files/MoD2RE7621.pdf
[9] Capital Outlay on Defence Services, Procurement Policy, Defence Planning And Married Accommodation Project", Standing Committee on Defence (2020-21), 17th Lok Sabha, Report No. 25, Lok Sabha Secretariat, New Delhi, Dec 2021, p. 22-23
[10]https://economictimes.indiatimes.com/news/defence/rs-1-93-lakh-cr-worth-of-military-equipment-imported-between-2017-18-and-2021-22-govt-data/articleshow/97581011.c

According to Stockholm International Peace Research Institute (SIPRI), India was the largest importer of arms in 2017-21 along with Saudi Arabia (Fig 4.1).

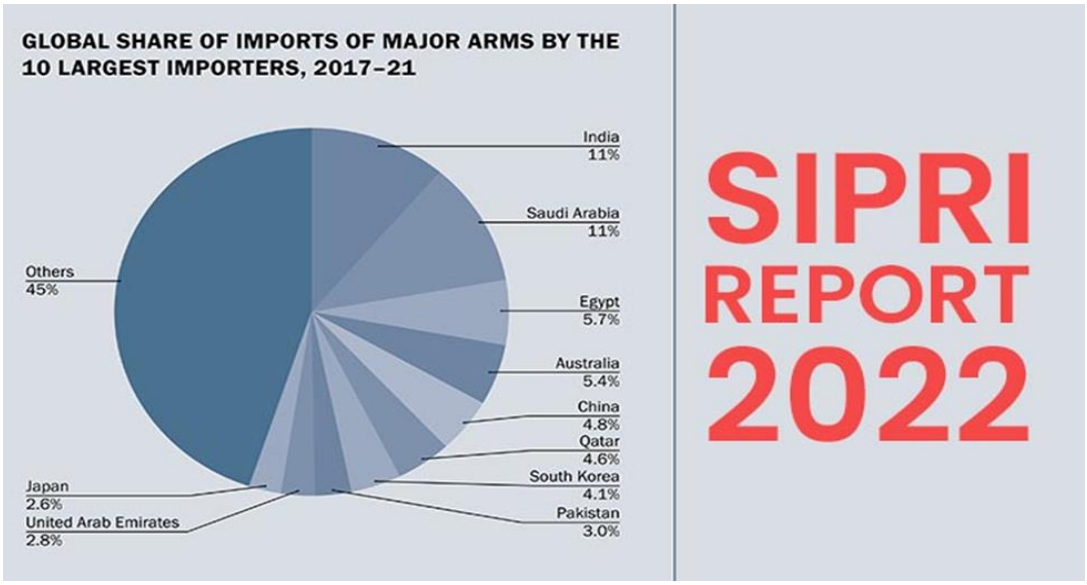


Fig 4.1 Global share of imports by 10 Largest importers 2017-21

The above Figure clearly shows that India has been one of the top arms importers with a 11 percent share along with Saudi Arabia followed by Egypt, Australia, China, Qatar, South Korea and Pakistan.

Case Studies

Israel

Israel has developed an advanced defence industry by initially buying most weapons from friendly nations and parallelly setting up in-house facilities tailor made for its requirements and innovative solutions, by creating state of the art Research & Development facilities[11].

In order to achieve this set up, academia and government run Research establishments were brought together and applying various methodologies like reverse engineering, acquiring of defence systems knowledge through clandestine means. Other major drivers behind Israel's arms industry are highly educated and motivated

[11] Ranjit Ghosh (2017) Indigenisation, key to self-sufficiency and strategic capability, Global defence industrialization, page no 38-45.

population and strong government policy to defence R&D Approximately 8 per cent of military expenditure is diverted towards R&D, Israel's cordial relationship with USA and Europe and USA, mutual cooperation in military technology with these nations and regular financial support by US. Various sanctions and hostile neighbourhood during the 1960's led to setting up a broadly based indigenous arms production capability along with a liberal export policy. The operational solutions by Israel are innovative and lethal. R&D expenditure of Israel is approximately 4 per cent of its GDP. Defence allocation by Israel has continuously enhanced over the last decade. Israel is a major exporter in the military production sector. It is pertinent to note that Israel's policy of mandatorily joining the army at the age of 18 has led to rich dividends for development of a robust defence production industry. The Israel defence systems initially started at a modest scale and soon graduated to sophisticated weapon system. Israeli firms signed Joint Ventures with defence companies of other nations in order to develop products suiting their requirements and build up own markets. The journey/growth of Israel brings out how exports can play a role in generation of revenues for sustenance of defence industry when the domestic demand recedes. It also clearly highlights the impact of coordination between defence, engineers, scientists, academia and the industry. Several stringent measures were taken by the government to make the defence firms lean, efficient, competitive, internal restructuring and setting up joint ventures. The private sector thrived through accelerated industrial growth by enhancing capabilities and expansion of export opportunities. The relationship Israel shares with the US is also instrumental in growth and development of its defence industry. There have been numerous collaborations, joint ventures[12].

South Korea

Development of sophisticated defence equipment and technology in South Korea took place at a very low pace initially mainly due to its constant reliance on foreign nations for advanced weapon systems, focus of defence research activity on development of systems against advanced technologies and lack of coordination

[12] Ranjit Ghosh(2017) Indigenisation, key to self-sufficiency and strategic capability, Global defence industrialization, page no 48

between the ADD, responsible for R&D, and the defence industry. Main driver for development of South Korea into an advanced defence equipment manufacturer is a proactive and clearly defined policy which encouraged indigenisation and continuous upgradation of industrial capabilities aerospace technology. Also, various defence equipment was developed through joint production and transfer and technology. Air force assets are mainly procured ex-abroad. Few aircraft were acquired through co-production and advanced fighter aircrafts through licensed production. A large number of defence items for the army and the navy are developed through in-house industrial set up. Initially, the thrust of the Government was on development through domestic R&D. Later, the government changed its policy from domestic R&D to foreign procurement as in house development faced problems due to issues pertaining to cost and defects. In January 1999, the government introduced reforms to encourage participation of private industry in development of defence equipment. South Korea has followed two pronged strategy of export of high value items such as aircrafts and naval vessels and production of defence articles through domestic R&D. The share of R&D spending in GDP has steadily increased in recent years. The average value for South Korea during that period was 3.94 percent. The latest value from 2021 is 2.78 percent[13].

United States

US Department of Defence (DOD) follows two methods of sales of defence equipment, Foreign Military Sale (FMS) by Government and Direct Commercial Sale (DCS). There is a very good interaction between the Government and private industry for development of defence equipment[14].The Research and Development Centres with private sector are well developed and are able to deliver advanced technology at a fast pace than Government R&D centres.

[13] Ranjit Ghosh(2017) Indigenisation, key to self sufficiency and strategic capability, Global defence industrialization, page no 51-64

[14] Ranjit Ghosh(2017) Indigenisation, key to self sufficiency and strategic capability, Global defence industrialization, page no 99-118

The share of R&D industry is over 3.5 per cent of GDP, and is the largest net exporting industry in America. The US defence market at present comprises about 39% of the total global revenues. The U.S. national R&D intensity (R&D-to-GDP ratio)—a key measure of R&D investment—has also increased from 2.79% in 2016 to 3.39% in 2020.

Russia

Erstwhile Soviet Union had a very strong industrial system supporting Armed forces. Traditionally the industries producing military equipment were Government owned, however with opening up of economy and privatisation, Companies were restructured and decentralised. Slowly and steadily a number of private players emerged making the operations more competitive and efficient.

United Kingdom

Similarly in United Kingdom, the state owned armament producing industries were privatised. They were made more competitive and defence procurement was opened up. Government proactively followed the policy of supporting R&D in defence sector, continuous upgradation and development of new technologies. Further, there is a healthy good interaction between the Government and private industry for development of defence equipment.

China

The major factor driving the rapid progress in China's defence industrial capability is Beijing's continuous investment in its military. Post-economic liberalisation, its integration with the global R&D, effective production set up and high levels of R&D funding has enabled the defence sector to evolve from a reliance on Russia to highly capable defence industry. China's defence industry in past 60 years has undergone number of steps of structural reorganisation. The massive financial support and continued reforms measures, especially since the 1990s has led to

significant progress in the Chinese defence industrial output and capability. The focus of Chinese procurement policy is to lay stress on Research and development, development of advanced technologies with respect to EW and IW warfare[15].

Evolution of Defence Industry in India

After the independence, from 1947 till the early sixties, owing to almost nonexistence of defence industry, India was forced to fulfil its defence requirements through imports from developed countries.

The situation has continued, leaving a few agreements with the erstwhile Soviet Union, which allowed for Indigenous Manufacture under licensed production. There was a limited Transfer of Technology without the scope for design and development. Further, there was low investment in defence by both the government and the private sectors, technology embargos, lack of any significant technology development by Ordnance Factories (OF's) and the Defence Public Sector Undertakings (DPSU's). There was no motivation for the industry to enhance indigenisation by the government. The Indian private sector was virtually kept out of the defence sector's manufacturing and production activities, as compared to other militarily advanced countries, rendering the nation dependent on imports.

Post 1991, the private sector commenced entry in defence sector. Further, defence sector was opened by the Government to private industry in 2001 and permitted foreign investment (26 per cent) in defence sector, There was a very limited success after these reforms[16]. However, it inculcated joint production, development and Research and Development, which was a major paradigm shift. India started insisting on obtaining core technologies. By virtue of this approach there was a thrust on indigenisation and continuous upgradation of domestic defence. 'Production Board' and the 'R&D Board' were set up in 2001 along with preparation of Long Term Perspective Plans (LTPP) for Armed forces. In 2005, Offsets were introduced for high

[15] Ranjit Ghosh(2017) Indigenisation, key to self-sufficiency and strategic capability, Global defence industrialization, page no 99-118

value projects. Defence Production Policy (DPrP) was issued in 2011 with an aim to achieve self-reliance in defence production. In 2012, 'Long Term Integrated Perspective Plan' (LTIPP) 2012-27 and 'The Technology Perspective and Capability Roadmap (TPCR)-2013' were brought out with an aim to apprise the industry about the requirements of defence services. Defence Procurement Procedure (DPP) was first issues in 2002 and thereafter reviewed at regular intervals till final issuance of DAP 2020.[16]

Present Status of Indian Defence Industry

Inspite of so many initiatives and policy reforms by the Government the status of indigenisation, in the last 75 years, is far from satisfactory. India's Defence Minister released an e- booklet listing "20 Achievements of the Ministry of Defence in 2020" On June 07, 2021 comprising of achievements and policy reforms taken by the Government[17,18] Major policy reforms in last few years are issuance of Defence Acquisition Procedure (DAP-2020) with enhanced emphasis on indigenisation, appointment of the Chief of Defence Staff (CDS) and creation of the Department of Military Affairs (DMA), enhancement of the FDI limit in defence sector from 49% to 74% in the automatic route, amendment to the offset policy for global acquisitions, setting aside nearly 58% (approximately Rs. 52,000 Crores) of the allotted capital-modernisation budget for acquisitions from domestic sources, 87% of the capital acquisitions approved during the Year 2020 being sourced from domestic industry, laying stress on technology development, slew of incentives for encouraging MSMEs increasing defence exports (which increased from Rs 1941 Crores,in 2014-15 to Rs 5711 Crores, in 2020-21), presently India ranks 24th amongst arms exporters (with a share of only 0.2%) [19]. An ambitious export target of Rs 35,000 Crores with respect to defence sector, have been set for the year 2025, in the draft Defence Production and

[16] Ranjit Ghosh(2017) Indigenisation, key to self-sufficiency and strategic capability, Global defence industrialization, page no 4-5

[17] Ministry of Defence. June 07, 2021. https://www.mod.gov.in/sites/default/files/MoD2RE7621.pdf

[18] Press Information Bureau, New Delhi. Raksha Mantri Shri Rajnath Singh releases E-booklet on 20 MoD reforms in 2020; June 07, 2021. https://pib.gov.in/PressReleaseIframePage.aspx?PRID=1725091

[19] https://sipri.org/sites/default/files/2021-03/fs_2103_at_2020.pdf ,SIPRI Fact Sheet 2021. March 2021. Pg 2, Table 1.

Export Promotion Policy 2020[20]. Two defence industrial corridors, one each in Tamil Nadu and Uttar Pradesh have also been announced[21].The share of the capital modernisation budget earmarked for procurement from domestic industry has been enhanced from 58% to 63% (Rs 70,221 Crores)[22].

Defence minister Rajnath Singh announced at Aero India 2023, Asia's biggest military air show, " that India has earmarked 75% of this year's defence capital procurement budget for buying weapons and systems from local manufacturers -- a move aimed at unlocking new opportunities for achieving self-reliance targets and ramping up the country's defence exports". In the Union Budget announced on February 1, India set aside ₹5.94 lakh crore for defence spending in 2023-24, with the allocation almost 12% higher than that in last year's budget estimates, India allocated ₹5.25 lakh crore for military spending in last year's budget, ₹4.78 lakh crore in 2021-22, and ₹4.71 lakh crore the year before. Around ₹1 lakh crore has been set aside for domestic procurement this year, compared to ₹84,598 crore, ₹70,221 crore and ₹51,000 crore in the three previous years[23]. Further, Rs. 116 Crores have been kept aside for "Innovation for Defence Excellence (iDEX)" start-ups and 45 Cr for DTIS[24]. Budgetary support of Rs. 499 Crores has also been allocated to provide financial support for approximately 300 start-ups/MSMEs/individual innovators and 20 partner incubators under the Defence Innovation Organisation (DIO), over the next five years[25]. The MoD had earlier promulgated 'First, Second and Third Positive Indigenisation Lists', comprising 310 items on August 21, 2020, May 31, 2021 and April 07, 2022 respectively. The 'Fourth Positive Indigenisation List' of 101 items was announced by Prime Minister Shri Narendra Modi during the opening ceremony of Def Expo 2022 in Gandhinagar, Gujarat on October 19, 2022. All the items included in the lists will be procured from indigenous sources as per provisions given in Defence Acquisition

[20] Draft Defence Production & Export Promotion Policy - DPEPP 2020. https://www.ddpmod.gov.in/dpepp.
[21] Defence Corridors. Press Information Bureau, Government of India, Ministry of Defence. July 17. 2019. https://pib.gov.in/Pressreleaseshare.aspx?PRID=1579096
[22] Ministry of Defence. Press Information Bureau. February 22, 2021. https://pib.gov.in/PressReleseDetailm.aspx?PRID=1699992
[23] Rahul Singh, 16 Feb 2023, https://www.hindustantimes.com/india-news/domestic-share-in-defence-acquisitions-raised-to-75-101676495854263.html
[24] https://www.pib.gov.in/PressReleasePage.aspx?PRID=1895472 ,01 Feb 2023
[25] Scheme for Innovations for Defence Excellence (iDEX) https://www.ddpmod.gov.in/sites/default/files/iDEX%20scheme%20Final3.pdf

Procedure (DAP) 2020. This list provides continuous impetus towards self-reliance in defence[26]. Ordnance Factories Board (OFB), which hitherto controlled the existing 41 Ordnance factories, has been dissolved. This has been replaced by seven holding companies.

Being the third largest Armed Forces in the world (after US and China) and surrounded by hostile neighbours, India's military requirement are expected to grow every year. India has been spending around two per cent of its GDP on defence and at present is the ninth ranked defence spender in the world. India has earned the dubious distinction of being the world's leading arms importer for four consecutive years (2017-21) (Fig 4.2).

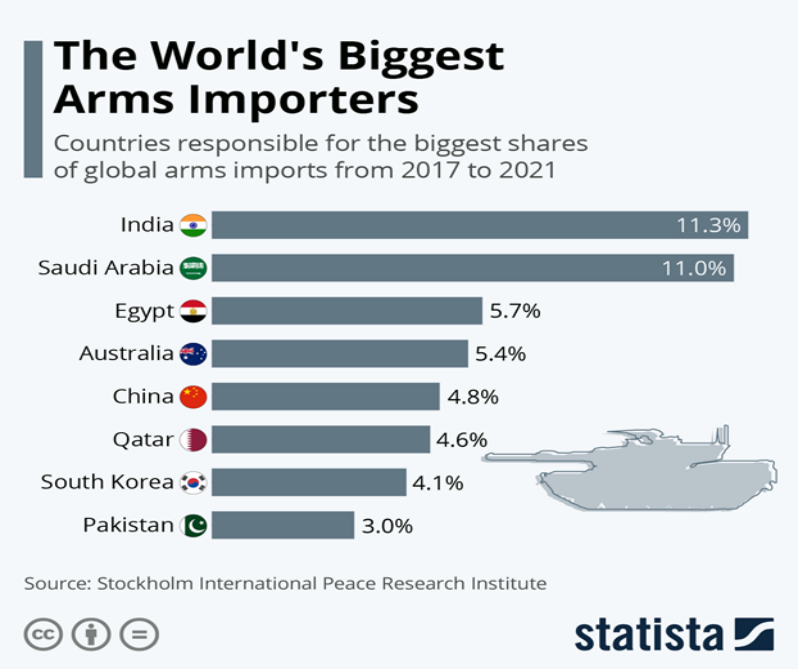


Fig 4.2 World's Top Importers Major Arms 2017-21

Source: Adapted from "SIPRI Yearbook 2022 - Recent trends in arms transfers".

[26] https://mod.gov.in/sites/default/files/PM-announces-fourth-positive-indigenisation-list.pdf

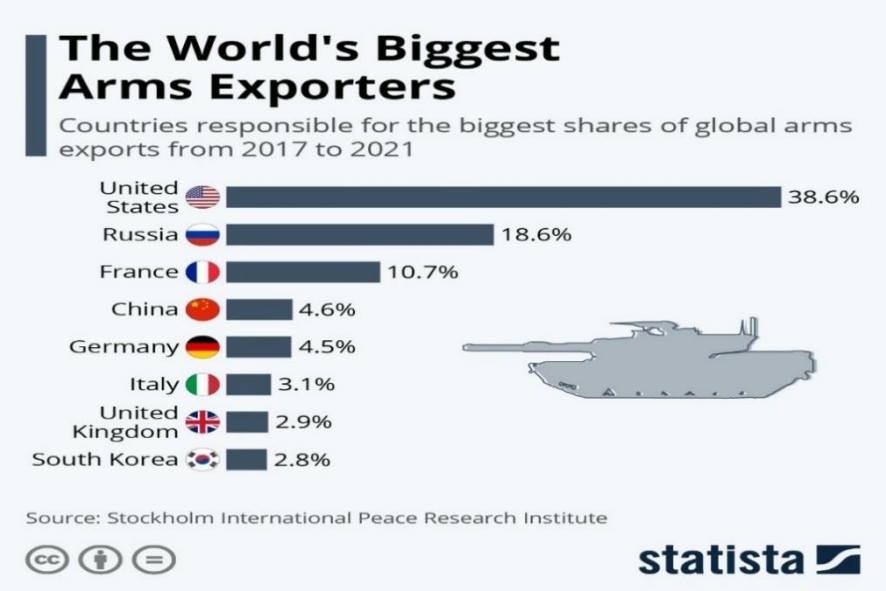


Fig 4.3 World's Top Exporters of Major Arms 2017-21

Source: Adapted from "SIPRI Yearbook 2022 - Recent trends in arms transfers".

As shown in the Figure 4.3 above India does not figure in top eight arms exporters. The share of India in global arms exports is mere 0.2 %. It is not difficult to appreciate that inspite of huge continuous requirement of military hardware by the three services, India leads in the imports of arms. Presently Indian defence industry and Research establishments comprises of 52 defence laboratories and establishments, nine DPSUs, 39 OFs and a fast growing private sector (about 35 major firms besides approximately 3000 Micro, Small and Medium Scale Enterprises i.e. MSMEs).

Indian defence Budget

The overall defence budget earmarked for 2023-24 is Rs 5.94-lakh crore (Fig 4.4),including pensions of Rs 1.38-lakh crore—up by 12.9 per cent from Rs 5.25-lakh crore allocated in the previous (2022-23) fiscal. This is 13.18 per cent of the total budget outlay of Rs 45,03,097 crore. Excluding the pay and allowances, Rs 90,000 crore was allocated for revenue procurements—procurement of already sanctioned assets in service including renewals and replacements—over the previous fiscal's allocations of Rs 62,431 crore, spread across works, transportation, ordnance and

supply stores. The increased requirement for these funds is also evident with the government enhancing revenue budget allocations by Rs 26,000 crore during a mid-term review in 2022. “This will cater to sustenance of weapon systems, platforms including ships, aircraft and their logistics, boost fleet serviceability, emergency procurement of critical ammunition and spares; procuring of niche capabilities to mitigate capability gaps wherever required, progress stocking of military reserves, strengthening forward defences,” the Defence ministry said in a statement. “ Overall, the revenue budget, including the pay and allowances of defence personnel, saw an increase of 17.39 per cent. The revenue budget also includes first-time allocations worth Rs 4,266 crore towards the Agnipath scheme for utilisation in training aids, simulators, and infrastructure. The scheme was announced last year and the first batch of Agniveers across the three services is undergoing training at present. The defence budget earmarked Rs 1.62-lakh crore towards the capital budget of the Armed Forces. This was a meagre hike of 6.57 per cent in modernisation funds with limited new contracts being signed and much of the scheduled payments and deliveries yet to be made. ”Dutta, A. N (2023)Indian Express.

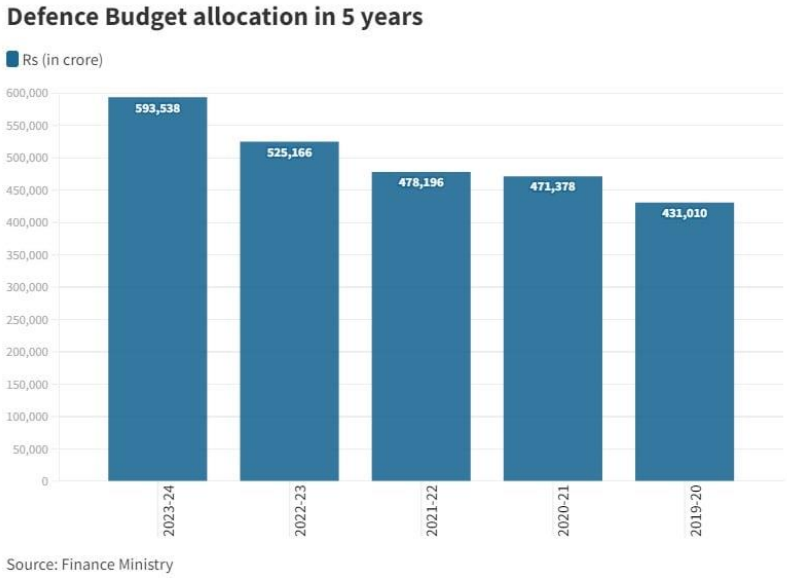


Fig 4.4 Indian military expenditure trends

Source: https://www.cnbctv18.com/finance/union-budget-2023-nirmala-sitharaman-defence-sector-allocation-capital-outlay-armed-air-force-navy-indigenous-procurement-15785131.htm accessed on 20 Feb 23

India’s defence spending as a proportion of its total government expenditure has been decreasing over last ten years. Defence expenditure as a percentage of GDP has

also reduced from 2.3 % in 2012-13 to 2 % in 2022-23. “In the MoD’s overall budget of FY2022-23, the capital expenditure has outgrown the revenue expenditure (14 percent vs. 7.9 percent), resulting in improvement in the revenue-capital ratio from 71:29 in 2021-22 to 69:31 in 2022-23”. Behera,L.K.(2022). However, although in percentage terms, the capital expenditure has outgrown the revenue expenditure, the latter still contributes more to the overall growth, in absolute terms, this is largely because of the volume effect.

Table 4.1. Revenue-Capital Ratio of Armed Forces, 2022-23

	Army	Navy	Air Force
Revenue Expenditure (INR Billion)	1648.98	254.06	328.73
Capital Expenditure (INR Billion)	321.35	475.91	568.52
Total (INR Billion)	1970.33	729.97	897.25
Share of Revenue Expenditure (%)	84	35	37
Share of Capital Expenditure (%)	16	65	63

Source: https://www.orfonline.org/research/bigger-not-necessarily-better/

Accessed on 08 Feb 23

Table 4.1 depicts the for revenue-capital ratio of armed forces. “ In the modernisation budget for the Armed Forces, the Indian Air Force got the highest allocation among the three services at Rs 57,000 crore, which was, however, a mere 3.6 per cent hike from 2022-23. While the Army was allocated Rs 37,000 crore, a hike of 15.6 per cent from the previous fiscal’s budgetary allocations, the Navy was allocated a capital budget of Rs 52,000 crore, up by 10.6 per cent from 2022-23”. Dutta, A. N (2023) Indian Express. However, the share of Air Force has remain the same which definitely is not justifiable keeping in mind the various deals in pipeline including the MMRCA. The personnel-intensive Indian Army continues to corner the biggest share in the DSE (**Figure 4.5**), although its share has declined to 51 percent from 54 percent in the previous budget. Notably, its decline in share has not improved its revenue-capital ratio. Rather, it has worsened further from 80:20 to 86:14 (**Table 4.1** for revenue-capital ratio of armed forces).

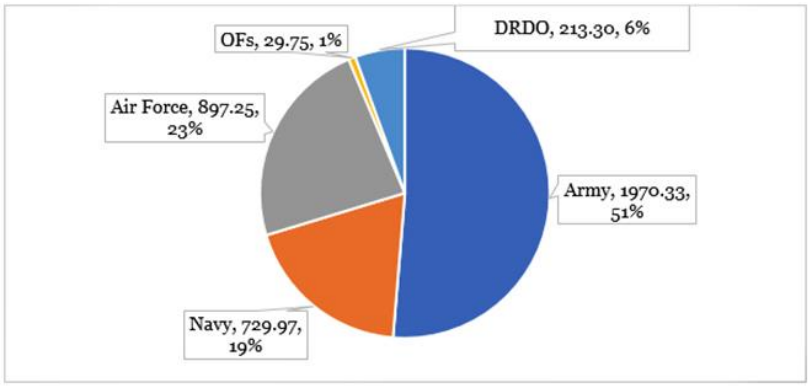


Fig 4.5 Share of Defence Services in Defence Services Estimates (DSE) 2022-23 (INR Billion and %) Source: https://www.orfonline.org/research/bigger-not-necessarily-better/ accessed on 08 Feb 23

Data tabled in the Rajya Sabha on 07 Feb 2022 showed that indigenous production of military equipment was worth Rs 74,054 crore in 2016-17. It jumped to Rs 84,643 crore in 2020-21(**Fig 4.6**). However, the data shows that India continues to import defence equipment at the same level as it was doing in 2014-15. This hovers around 39 to 40 per cent of all acquisition under the capital head of the Budget. Imports spiked to 48.68 per cent of the acquisition in 2018-19(**Table 4.2**). The indigenous content and the Foreign Exchange outgo is nearly 50 per cent. This is mainly due to the fact that in many of the major TOT produced items by OFB/DPSUs, a high percentage of raw materials and procured from abroad.

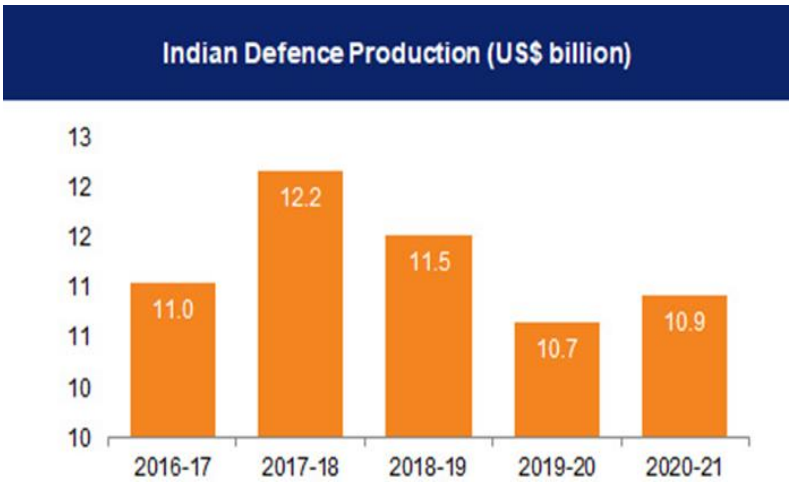


Fig 4.6 Trends of Indian defence production in last Five years

Source https://www.ibef.org/industry/defence-manufacturing accessed on 08 Feb 23

Table 4.2 Trends of Foreign procurement

(Rs. In Crore)

Year	Foreign Procurement	Foreign Procurement as % age of total Capital Acquisition Head
2014-15	25,980.98	39.45
2015-16	23,192.23	37.20
2016-17	27,278.09	39.45
2017-18	29,035.42	39.92
2018-19	36,957.06	48.68
2019-20	38,156.83	41.89
2020-21	42,786.54	36.00
2021-22*	29,658.14	39.44

* Upto December, 2021

Source https://www.indiandefencenews.in/2022/02/import-of-military-items-at-same-levels.html

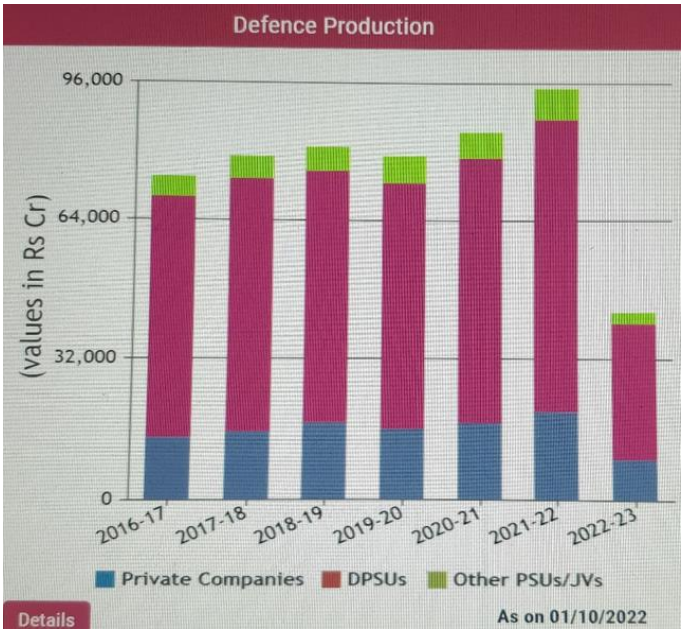


Fig 4.7 Trends of Indian defence production during last seven years

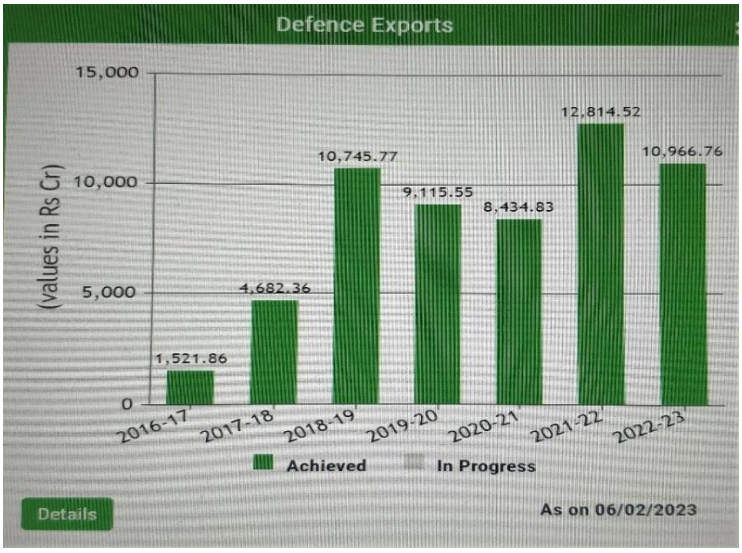
Source: Online dashboard Ministry of Defence's (MoD's) Department of Defence Production (DDP)

Fig 4.7 clearly brings out how defence production has been growing in India over the years. DPSUs and private industry has shown a distinct upward trend. The value of

indigenous defence production in the last three financial years 2019-20, 2020-21 and 2021-2022 are Rs 79,071 crore, Rs 84,643 crore and Rs 94,846 crore respectively.[27]

According to estimates, the Indian armed forces are projected to spend around USD 130 billion in capital procurement in the next five years. The defence ministry has set a goal of a turnover of USD 25 billion (Rs 1.75 lakh crore) in defence manufacturing in the next five years that included an export target of USD 5 billion (Rs 35,000 crore) worth of military hardware[28]. In fiscal year (FY) 2021–22 India reached a new milestone of nearly INR130 billion (USD1.6 billion) in defence exports. An updated online dashboard run by the Ministry of Defence's (MoD's) Department of Defence Production (DDP) shows that the value of defence exports jumped year-on-year by 51% in 2021–22 to INR 12814.52 Crores (**Fig 4.8**). Trends of Indian defence offsets during last seven years is also depicted at **Fig 4.9** as per updated online dashboard of Ministry of Defence's (MoD's) Department of Defence Production (DDP).It has also shown an increasing trend.

Fig 4.8 Trends of Indian defence exports

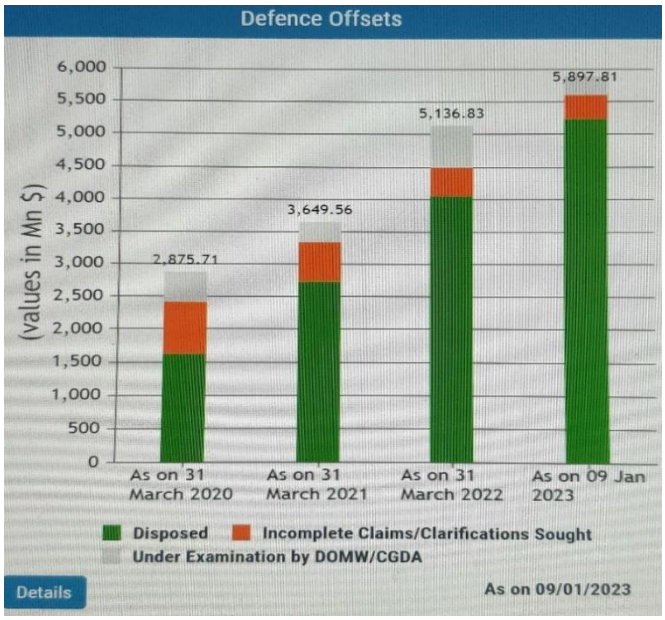


Source: online dashboard Ministry of Defence's (MoD's) Department of Defence Production (DDP) during last seven years

[27]https://swarajyamag.com/defence/indias-indigenous-defence-production-in-last-three-financial-years-was-worth-rs-258-lakh-crore-govt

[28] https://economictimes.indiatimes.com/news/defence/capital-procurement-proposals-worth-rs-2-15-lakh-crore-approved-in-last-3-years- govt accessed on 08 Feb 23

Fig 4.9 Trends of Indian defence offsets during last seven years



Source: online dashboard Ministry of Defence's (MoD's) Department of Defence Production (DDP) during last seven years

Defence Public Sector Undertakings

HAL is the largest of the nine DPSUs of India. Over the years, it has evolved into a large aeronautics enterprise. Hindustan Aeronautics Ltd (HAL), since its inception, has been engaged in licenced production, designing and manufacturing of fighter jets, helicopters, jet engines, avionics, software development, spare supply, overhaul and upgradation of Indian military aircraft. HAL has been involved in overhaul and major repairs of various aircrafts of IAF comprising of fighters, transport and helicopters. In the helicopter fiels also HAL has made a significant contribution, from Chetak, Cheetah, Lancer, Cheetal and Chetan helicopters to indigenous Advanced Light Helicopter "Dhruv", which has been inducted in all three services in large numbers. Recently, the weaponised variant "Rudra" and Light Combat Helicopter (LCH) "Prachand" have firmly established India on the path of "Atmanirbharta" in the field of military aviation manufacturing[29].

[29] Modernisation of Military Aviation In Pursuit of 'Atmanirbhar Bharat'November 11, 2022; By: Air Cmde SP Singh, VSM (Retd) published at https://bharatshakti.in/modernisation-of-military-aviation-in-pursuit-of-atmanirbhar-bharat

Light Combat Aircraft (LCA) "Tejas" is a 4.5 Generation aircraft for which the Indian Air Force (IAF) has committed more than 300 numbers. There is a continuous thrust towards meeting the stringent timelines of the Fifth-Generation stealth fighter, Advanced Medium Combat Aircraft (AMCA). Further, HAL also maintained a reasonable pace of development with respect to transport aircraft to meet the requirements of IAF and Indian Navy (IN). HAL had been undertaking production "Avro" and Dornier 228 . These two transport aircraft are of great usage for light utility roles of IAF during last few decades.

Production of C-295 in India

Setting up of C-295 transport aircraft manufacturing facility in Vadodara is likely to be a major game changer in Atma nirbhar bharat abhiyan. As per the contract between M/s Airbus Defence and Space (Spain) and TASL under "make in India" initiative, the first 16 flyaway aircraft would be delivered between September 2023 and August 2025, while the first Made-in-India aircraft will roll out of the new facility in September 2026 and the remaining 39 by August 2031. The production rate would be approximately eight aircraft production per year[30].

It is the first of its kind and the largest investment in the defence sector, propelling the country's advancement of the domestic defence and aviation manufacturing ecosystem. There is also a considerable Maintenance, Repair and Overhaul (MRO) market to be tapped. India has already started exporting its indigenous aircraft like LCA and LCH.

Innovation and Technology development

"Innovation and Technology development are most important drivers of achieving self-reliance under Atmanirbhar Mission of Government of India. As country

[30] Modernisation of Military Aviation In Pursuit of 'Atmanirbhar Bharat'November 11, 2022; By: Air Cmde SP Singh, VSM (Retd) published at https://bharatshakti.in/modernisation-of-military-aviation-in-pursuit-of-atmanirbhar-bharat

and company, this is game changer and make greater impact as compared to transfer of technologies from foreign OEMs. The war scenario is going to change in future and greater emphasis will be on unmanned systems and artificial intelligence. HALs R&D efforts will be in this direction to develop Combat Air Teaming system and its elements through in-house development and through partnership with other organisations. Engine technology is also prime driver to become self-reliant and HAL's two projects on engine development in respect of fixed wing and Rotary wing are going in full swing and they are sure to get certified. HAL is also going to take the lead role in development and production of high thrust engine for India's future fighter projects like AMCA (in collaboration with DRDO). We have many in-house R&D projects like Indian Multi-Role Helicopter (IMRH), Civil Certification of Light Utility Helicopters, UAVs etc in pipeline. I am proud to highlight that with development of IMRH, India will be one of hardly 5-6 countries in the world, which has achieved milestone of design and development of all class of Helicopters. We are working closely with IITs, Startups apart from DRDO labs in terms of technology development in various fronts including artificial intelligence". M.S. Velpari, Director (Operations), HAL,recently said in an interview with AEROMAG. Apart from this, HAL has also formed 16 Joint ventures companies in collaboration with Major Indian and International companies. In the financial year 2021-22, the "Company recorded the highest ever turnover of Rs. 24,36,166 Lakh, experiencing strong growth of 8% from the previous year's Rs. 22,50,096 Lakh. The Profit Before Tax (PBT) saw a growth of 22% from Rs. 4,27,738 Lakh to Rs. 5,23,115 Lakh while the Profit After Tax (PAT) increased by 57% from Rs. 3,23,945 Lakh to Rs. 5,08,650 Lakh". The Order Book position stood at a healthy Rs. 82,15,400 Lakh as on 31st March, 2022.[31] Source HAL annual report 2021-22.

Indian Military Aviation Industry

Military aviation is a very complex and highly dynamic sector characterized by innovative and advanced technology. The industry dealing with military aviation involves production of aircraft, aero engine, propulsion units, and associated spares.

[31] HAL annual report 2021-22

Main characteristics of military aviation industry are long duration incudes R&D, design, manufacturing, assembly, maintenance, repair and overhaul. India is one of the fastest-growing aerospace markets. “Growth and development of the Indian defence industry is an amazing success story. There are various Bengaluru-based public and private companies which are now involved in design and manufacture of major defence equipment. Bengaluru-based Dynamatic Technologies is making aero structures for global companies like Bell, Airbus and Boeing. Idea Forge, which got a contract recently from the Indian Army for smaller tactical UAVs, now has an export order. Kanpur-based Lohia Group is into 100 per cent exports. Bharat Forge and Tata are making artillery guns for the Army. Larsen and Toubro (L&T) is making guns, warships and hulls of nuclear submarines. Bengaluru-based New Space and Technologies has inked a contract with the MoD to make a high-altitude communications and surveillance ‘pseudo satellite’ that can remain airborne for months. The other side of the success story is joint ventures. Airbus has tied up with Tata to make the C-295 military planes in India. The world’s biggest military equipment company, Lockheed Martin, in December last year formally recognized Tata-Lockheed Martin Aerostructures Limited (TLMAL) as a potential future co-producer of fighter wings. The TLMAL facility is integrated into Lockheed Martin's global supply chain for making parts of the C-130J planes. Adani makes complete carbon composite aerostructures for Hermes 900 UAV for Israeli company Elbit. Mahindra is making the ULH M77 guns in collaboration with BAE systems and separately has a contract with Indian Navy to make submarine warfare suites. Boeing has a joint venture with Tata for making aerostructures of helicopters. The future for India is making the next generation fighter jet called the Advanced Medium Combat Aircraft (AMCA) on its own. A design is being readied. The stumbling block — having a jet engine — has been removed. A tie-up is on the cards with French company Safran to make a jet engine. Safran has a joint venture with Hindustan Aeronautics Limited to make helicopter engines.The future is Artificial Intelligence, unmanned fighter jets, armed UAVs and robotics. These are in various stages of development.The capital budget meant for acquisition of equipment for this fiscal will be Rs1,52,370 crore ($20

billion), which is a 76 per cent jump over Rs 86,741 crore allotted in 2013-14"[32].Banerjee, A. (2023).

In the past three years, the MoD has accorded Acceptance of Necessity (AoN) – the first step to procure — for equipment worth Rs 2,47,515 crore from domestic makers. Out of the total 191 acquisition contracts signed in three years, 121 were with Indian vendors. Innovations for Defence Excellence (iDEX) is engaging industries, including MSMEs, startups, individual innovators, R&D institutes and academia, with a budget of Rs 498.78 crore for financial support.

"The expenditure on defence procurement from foreign sources has gone down from 46 per cent to 36 per cent, thereby reducing the import burden in the last three years, from 2018-19 to 2020-21", Mr Ajay Bhatt stated recently in the Lok Sabha[33]. The Defence Production and Export Promotion Policy (DPEPP) is looking to provide a focused thrust to defence production capabilities, including aerospace and naval shipbuilding sectors. The big 'make in India' plans includes high technology system like Hypersonic glide vehicle, Directed energy weapons (300 KW and more)-High-powered electromagnetic devices and high-powered laser devices, Naval Ship-borne Unmanned Aerial System, Light weight tank, Indian multi-role helicopter in SPV mode, Low orbit pseudo satellites etc.

Research and Development: Defence Manufacturing

India has a well-established methodology of formulating plans for acquiring defence equipment that comprises of three levels i.e. 15-year Long Term Integrated Perspective Plan (LTIPP), five-year Services Capital Acquisition Plan (SCAP) and two-year roll-on Annual Acquisition Plan (AAP). However, these plans are formulated

[32] https://www.tribuneindia.com/news/features/india-as-an-emerging-weapons-exporter-383067 accessed on 08 feb 23 article by ajay Banerjee

[33] Ajay Banerjee https://www.tribuneindia.com/news/features/india-as-an-emerging-weapons-exporter-383067

without taking domestic industry on board. Invariably, during the acquisition process, there are no solutions forthcoming from DRDO and domestic defence industry. Since the success of Make In India lies in converting the requirement of the three services into the desired defence systems, it is essential that the government formulates a strategy for the industry and R&D so as to identify specific projects that would be executed by indigenous industry[34].

DRDO has been the mainstay of defence research and development since its inception in 1958, albeit without any major benefits. There have been issues pertaining to delay in delivery of system to three services, quality and exorbitant expenditure over estimation. Along with low pace of Research and Development and academia, below par performance of DRDO has forced India to increased imports. Research and development is laid special emphasis by nations leading in defence industry through an ecosystem of research institutes, universities and industry. Few case studies are enumerated below:

United States

The Defence Advanced Research Projects Agency (DARPA) of the US does not do R&D on its own. There is not even a lab with DARPA. The agency follows the methodology of picking up innovative ideas and awards R&D contracts to concerned individuals/organisation with stringent timelines of three-to-five years. In nutshell, DARPA's responsibilities are finalisation of projects, monitoring and managing the programmes[35].

Israel

The astounding progress made by Israel is due to the Office of the Chief Scientist (OCS), since its inception in 1974. Like the DARPA, the OCS identifies and signs R&D contracts with the individuals/organisations with path breaking ideas and

[34] Laxman Kumar Behera https://www.idsa.in/policybrief/MakeinIndiaforDefence_lbehera_050215
[35] Ibid.

manages them. OCA's does not subsidise R&D but mitigate risks by providing financial assistance. Approximately one-fourth of the OCS budget comes from the royalties paid back by companies which are successful in converting R&D funding into marketable products.

Human Resource Development

Defence industry requires a highly skilled labour force. Although DRDO is handling more than 50 projects, the number of scientists have not increased since last two decades. There is a need to formulate a comprehensive policy for skill development especially for defence industry. "Further, it is pertinent to note that educational profile of the personnel involved in R&D is average. The Rama Rao Committee, in its report (February 2008), had brought out predominance of first degree holders in the DRDO's scientific cadre. Also, only 10 per cent of the scientific manpower had higher qualification of Ph.D. Majority of the workforce had no previous experience or training in research, observed the Committee"[36].

Same issues have been affecting major Research & Development organisations like the ISRO and atomic energy department, and Hindustan Aeronautics Ltd (HAL), a large aeronautics enterprise. Main cause for low level of training or experience is the teaching methodology of most Indian academia. In order to obviate this issue, ISRO runs a dedicated university, the Indian Institute of Space Science and Technology (IIST) that provides graduate, post-graduate and doctoral programmes in the areas of space science and technology. There is no such dedicated university for defence. The aerospace industry comprising of R&D, manufacturing, and Maintenance, Repair and Overhaul (MRO), will require huge trained and highly skilled manpower, vindicating set up of a dedicated defence technology university. A major constraint in the growth and development of sector in defence sector is lack of trust. There are various procedural complexities hurdles in fructification of a contract involving R&D as per the DPM. As per the official estimate of the MoD, India is likely to spend around $130 billion on defence modernisation in the coming seven-to-eight years. This bestows

[36] Laxman Kumar Behera https://www.idsa.in/policybrief/MakeinIndiaforDefence_lbehera_050215

tremendous challenges and opportunities to private defence industry thereby ultimately leading to self-reliance. The private industry is to be provided adequate incentives for 'Make in India' to become a real success story. Over last few years, India has emerged as a largest defence market with a number of major acquisitions lined up in next few years. There is a need to galvanise the private industry further by encouraging them to get into Joint ventures with global Aerospace and Defence companies to acquire niche technology and facilitate emergence of India as a super power.

Role of MSMEs

The Micro, Small and Medium Enterprises (MSME) sector has emerged as a fast growing sector contributing in the economic and social development of the nation. MSMEs work as ancillary units to large industries resulting in industrial development of the country[37]. The MSMEs produce diverse range of products and services in various sectors. A majority of spares of complex weapon systems and aircraft are manufactured by MSMEs. By December 2021, the total MSME count in defence PSUs spiked from 7,591 in FY18 to 12,000[38]. MSMEs enjoy inbuilt operational flexibility, low investments with sufficient capacity to develop and manage indigenous technology.

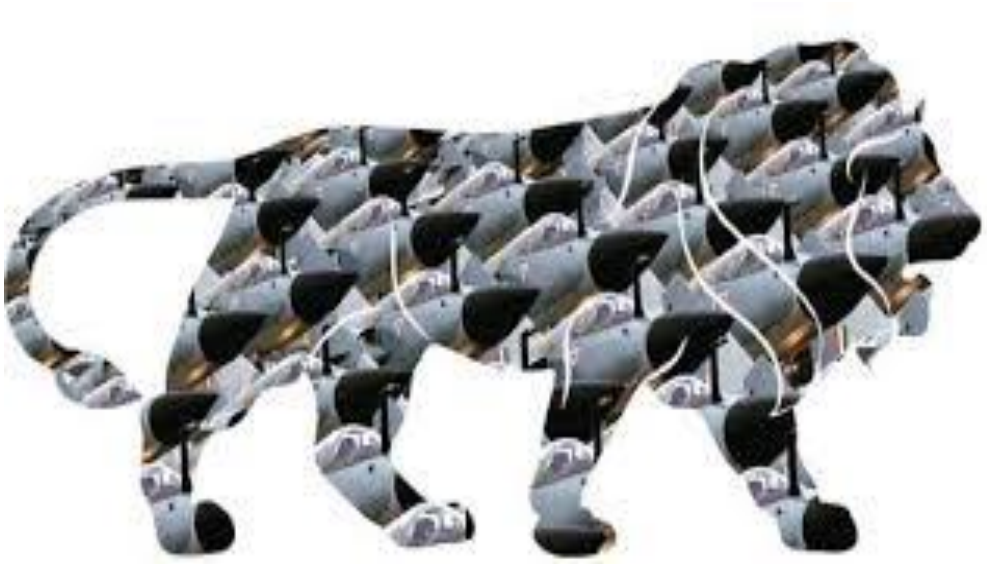
"MSMEs started their journey with DPSUs as their supply chain partners but today, they have come up to a level where they are playing an important role in discharging offset obligations, revenue procurement, and also in designing, developing, and manufacturing complete defence systems by themselves," Dwivedi, Myank (2022) Director, Industry Interface & Technology Management (DIITM), DRDO at an event organised by PHD Chamber of Commerce and Industry in March this year.[39]. Nearly 6000 MSMEs operate across the country supplying components and sub-assemblies to the DPSUs, Ordnance Factories, DRDO and Private Industries.

[37] https://msme.gov.in/about-us/about-us-ministry

[38] Sandeep soni, 01 Aug 2022, https://www.financialexpress.com/industry/sme/msme-eodb-make-in-india-govts-defence-purchases-from-micro-small-enterprises-hit-record-high-shows-govt-data/2613786/

[39] Sandeep Soni, 01 Aug 2022, https://www.financialexpress.com/industry/sme/msme-eodb-make-in-india-govts-defence-purchases-from-micro-small-enterprises-hit-record-high-shows-govt-data/2613786/

CHAPTER-V



ISSUES AND CHALLENGES OF INDIGENISATION IN DEFENCE SECTOR

Chapter V

Issues and Challenges for Indigenisation in defence sector

In this chapter, endeavour has been made to carry out in-depth study of issues and challenges affecting the indigenisation in defence sector, initiatives taken by the Indian government to galvanise the defence industry to enhance the indigenisation and evaluation of various policies impinging on defence procurement and manufacturing ie. DAP 2020, DDPMAS, Procedures for Design, Development and Production of Military Aircraft and Airborne Stores, indigenisation Policy for HAL, IAF, FDI policies, policies on offset and Joint Ventures.

Inspite of various initiatives/efforts by successive governments, India is still dependent on external sources for its defence requirements to a large extent. According to Stockholm International Peace Research Institute (SIPRI), India was the largest importer of arms in 2017-21 along with Saudi Arabia. This clearly brings out that although India has made substantial progress in last decade, however, India is far from the objective of substantive self-reliance in defence production. Under the 'Make in India' (MII) initiative launched by the Government initiative, 25 sectors including defence manufacturing have been identified to propel the nation to trajectory of a global manufacturing hub. In order to attain the aim of this initiative in the defence manufacturing sector, the government needs to address few issues challenges acting as obstacles in India's drive for self-reliance.

Lack of Institutional Mechanism

A major drawback in India's quest towards self-reliance is non availability of an empowered organisation which manages and coordinate the effort with all the stakeholders for self-reliance in defence manufacturing. In the absence of such an institution, various stakeholders are working in silos often contradicting each other rather than augmenting with synergy. Defence Research and Development Organisation (DRDO) is often at variance with Armed forces without scant respect for stringent timelines, urgent need and sanctioned budget. The defence industry undertake

production, without any focus on technology growth. As a result, the ultimate goal of achieving self-reliance is jeopardised and the three defence services resort to importing.

The Group of Ministers (GOM) nominated by the previous NDA government, had recommended the setting up of a Defence Minister's Council on Production (DMCP) under the leadership of the Defence Minister himself. Role of DCMP was envisaged to "lay down the broad objectives of the long term equipment policies and planning on production, simplification of procedures." However, this important recommendation of a DMCP has not been implemented. It is pertinent to note that, Defence Acquisition Council (DAC) was set up under the chairmanship of the Defence Minister. However, the DAC is geared towards addressing the short-term procurement-related hurdles rather than addressing the long term concerns of the domestic industry. In order to achieve Atmanirbharta, there is a need for establishment of the DMCP at the earliest.

Favourable Financial Regulations

Defence is a highly strategic sector and all the countries provide a wide range of financial incentives The Indian defence industry does not enjoy user friendly financial framework. This aspect makes it less productive/competitive vis a vis foreign companies. "Present interest regulations increases the cost of working capital exorbitantly for the Indian industry. The Indian industry also suffers on account of the variation in exchange rates. India follows a structure in which direct import is allowed free of duties whereas manufacturing the same product at home attracts several taxes and duties. The taxes and duties can raise the cost of local products by as much as 30 per cent. Government may accord 'infrastructure status' to defence industry, which would not only take care of the taxes and duties concerns of industry but also incentivise new investments. It is also highly desirable that certain sales of the local industry may be given 'deemed export status' whenever such sales are likely to substitute direct import"[40].

[40]Laxman Kumar Behera (05 Feb 2015) https://www.idsa.in/policybrief/MakeinIndiaforDefence_lbehera_050215

Vision and Efforts so Far

"The vision of the government is to achieve a turnover of $25 billion, including exports of $5 billion in Aerospace and Defence by 2025. Over the next 5-7 years, the Government of India plans to spend $130 billion for fleet modernization across all armed services. In line with the self-reliant India initiative, the share of domestic capital procurement, which was set at 64% of the Capital Acquisition Budget of the Defence Services in 2021-22 was increased to 68% for FY 2022-23. The Ministry of Defence has also notified three 'Positive Indigenization lists' comprising 411 defence types of equipment to be manufactured locally. Additionally, to promote export and liberalize foreign investments FDI in Defence Sector has been enhanced up to 74% through the Automatic Route and 100% by the government route"[41]. Government has taken steps to bring about de-licensing, de-regulation, export promotion and foreign investment liberalization in its endeavour to create a robust and transparent ecosystem.

The Government of India's intent is clearly evident in the issuance of DAP 2020, which is now the foundation of indigenous manufacturing and value addition. In order to achieve the Atmanirbharta mission and enhance the pace of indigenisation in defence manufacturing, the Government has bring about reforms and improvements in the policies pertaining to defence procurement. Major initiatives by the Government are enumerated below:

(a) Defence Production and Export Promotion Policy (DPEPP 2022) has been issued by Ministry of Defence (MoD) to provide a focused, structured, and significant thrust to the defence production capabilities

(b) Defence Acquisition Procedure (DAP 2020) has been issued to empower the Indian domestic industry through prioritisation of Make in India and encourage FDI for both for import substitution and exports.

[41] Maj Gen CP Singh (Retd) (07 Dec 2022) http://www.indiandefencereview.com/spotlights/indian-defence-industry-a-glorious-path-of-growth/

(c) The Defence Acquisition Council (DAC) approved the broad contours of the Strategic Partnership Model (SPM) which intends to engage the Indian private sector for manufacturing hi-tech defence equipment in India.

(d) The Government has recently converted the Ordinance Factories Board (OFB) from a Government Department into seven Government-owned corporate entities viz Ammunition & Explosives, Vehicles, Weapons & Equipment, Troop Comfort, Ancillary, Opto-Electronics and Parachute group with an objective to transform Ordnance Factories into productive and profitable assets.

(e) Two defence corridors have been established, one each in Uttar Pradesh and Tamil Nadu with an aim on development of indigenous manufacturing capabilities . The nodal agency for Uttar Pradesh Defence Industrial Corridor (UPDIC) has signed 69 MOUs with industry leaders, with a potential investment of Rs 10,545 crores. The nodal agency for Tamil Nadu Defence Industrial Corridor (TNDIC) has arranged investments to the tune of Rs 11,359 crores through MOUs etc., with 42 companies. To date, companies in TNDIC have made investments worth Rs 3,176 crores[42].

(f) "A large number of capital contracts and fast-track procurements worth Rs 47,000 crore from the Indian industry were concluded in 2021–22[43]. Of the capital acquisition contracts worth approximately Rs 90,000 crores in the last three financial years, approximately 83 % have been signed with the Indian industry".

(g) Innovations for Defence Excellence (iDEX) has been launched to encourage and engage innovators & entrepreneurs to deliver technologically

[42] Maj Gen CP Singh (Retd) https://raksha-anirveda.com/indian-defence-industry-striding-towards-atmanirbharta/ accessed on 11 Feb 23.
[43] Ibid.

advanced solutions for modernisation of the three defence services[44]. iDEX will provide them financial assistance in order to undertake R&D for future adoption for Indian defence and aerospace needs.

(h) Safeguard from Exchange Rate Variation (ERV) made applicable for Indian private sector also similar to DPSUs[45]. The Excise Duty/Customs Duty regime made uniform for both private sector and the public sector.

(g) 275 items of Ordnance Factory Board categorized as Non-Core, wherein Armed Forces can source these items directly from vendors[46].

(j) Simplified Make-II procedure issued, which provides preferential treatment to MSMEs for prototyping costing up to Rs 3 Crs[47].

(k) FDI up to 74% is now allowed under automatic route and above 74% can be done with Government approval. A list of weapons and platforms which will not be allowed for imports is being regularly promulgated which will increase every year[48].

(l) Up to 70% of the items i.e. parts, components, subsystems, raw materials etc. removed from the purview of industrial licensing. The initial validity of industrial license increased from 3 years to 15 Yr, further extendable up to 3 Yrs under IDR Act and lifetime validity under Arm's Act.

(m) Outsourcing and vendor development will be taken up by Defence Public Sector Undertaking's/Ordnance Factory Board for Indigenisation and import substitution.

[44] Lt Col Nikhil Srivastava https://dras.in/aatma-nirbhar-bharat-for-defence-sector/ accessed on 11 feb 23
[45] Ibid.
[46] Ibid.
[47] Ibid.
[48] Ibid.

(n) List of munition requiring authorization is kept in the public domain to remove ambiguities. The requirement of an end-user certificate to be countersigned/stamped by Government authorities dispensed with for exports of parts, components and sub-systems, etc. Applications are being received online. Standard Operating Procedure (SOP) for the issue of authorization for export put in the public domain. Specific time limit introduced for the issue of authorization.

(p) Defence Public Sector Undertaking need to make payment up to 90% of the amount to MSME within 30 days. Defence Public Sector Undertaking & Ordnance Factory Board have been asked to make provisions for an advance payment of 15% to MSME vendors.

(q) More priority would be accorded to Technology developed and designed in India. All DRDO patents and technology will be made available to the private sector at zero cost. Suo-moto proposals can be projected and will be considered on merit.

(r) Inter-Governmental Agreement signed with Russia for supply of aggregates followed by production for Russian equipment through JVs between Russian and Indian companies. More than 500 spares identified for floating of RFP.

The defence exports grew by 334% in the past five years. The expenditure on imports of defence procurement has reduced from 46%, to 36% of the overall expenditure in the last four years i.e., 2018-19 to 2021-22. The Government of India has set a target of Rs 1.75 lakh crores of defence production by 2025, which includes exports of INR 35,000 crores[49].

[49] Maj Gen CP Singh (Retd) https://raksha-anirveda.com/indian-defence-industry-striding-towards-atmanirbharta/ accessed on 11 Feb 23

Challenges in Research and Development

For the purpose of obviating the challenges in research and development of a robust defence R&D ecosystem, it is essential that for DRDO to engage with private industry and the Academia extensively. The government has announced allocation of 25% of its budget for R&D, promulgation by department of military affairs/ MOD of a positive import list of 411 systems/subsystems/components, promulgation by Department of Defence (R&D) of positive list of 108 systems and sub systems reserved for R&D by domestic industry. To encourage budding scientists M. Tech in defence technologies has been approved by AICTE. Ministry of Human Resource Development (MHRD) has approved 500 PhD students from IITs and NIITs who will be attached to DRDO laboratories. DRDO has been providing internships to students for last three decades.[50]

Study of Policies

DAP 2020 (Defence Acquisition Procedure)

The Defence Procurement Procedure (DPP), was initially promulgated in December 2002 after an in depth review of previous policy framework. This document laid down guidelines for "Buy" category procurements as decided by Defence Acquisition Council (DAC). Since its inception, DPP has continued to evolve based on the input and requirements of Services and industry. Amendments have been carried out at regular intervals in 2003, 2005, 2006, 2008, 2011, 2013, 2016 and 2020. These improvements were aimed at expediting acquisition of advanced technologies, enhancing the involvement of indian industry in manufacturing of defence equipment and improving Government accountability[51].

The participation of Indian industry through Buy (Indian) and Buy & Make (Indian) cases has been improving over last few years. It is pertinent to note that the overall procurement process from the issuance of RFP to Signing of Contract to

[50] Naval jagota, shashank sharma (25 Jul 2022) https://www.vifindia.org/article/2022/july/25/drdo-industry-interaction-on-improving-the-defence-r-d-ecosystem

[51] Ministry of Defence, Government of India, Defence Acquisition Procedure 2020

delivery of equipment to services are still very high. **The data on the required changes has been compiled based on in-depth discussion with functionaries from the services, CII, Acquisition wing and secondary data from various articles and from various reports submitted to the government.**

Defence Acquisition Procedure 2020 (DAP 2020) was issued in September 2020), as a measure by the Government to galvanise the indigenous arms manufacturing. DAP 2020 supersedes the previous procurement policy DPP 2016**.** The revised policy document has emphasised on higher indigenous content in procurement, faster acquisition and new offset guideline[52].

Planning for Procurement

The DAP 2020 has reduced the timelines for the Long-Term Integrated Perspective Plan (LTIPP)from 15 years to 10 years and renamed it as Integrated Capability Development Plan (ICDP). **DAP 2020 is now associated with the five-year Defence Capability Development Plan (DCAP), previously known as Services Capital Acquisition Plan (SCAP).** The correlation between ICDP and DCAP would provide credibility to the long-term plan document[53]. The DAP 2020 has revamped the procurement categories by introducing change in the Buy (Indian-Indigenously Designed, Developed and Manufactured) or 'Buy (Indian-IDDM)' category. A new category, 'Buy (Global-Manufacture in India)' has been introduced in place of the earlier 'Buy and Make'. Few significant improvements have been made in with an aim to ensure timely acquisition of military equipment, systems and platforms through optimum utilisation of allocated budgetary resources. DAP-2020 can be demarcated into six segments, as shown in table below.

[52] Amit Cowshish, "Decoding Defence Acquisition Procedure 2020", MP-IDSA issue Brief, November 20, 2020.
[53] Laxman Kumar Behera, "Defence Acquisition Procedure 2020: Imperatives for Further Reforms," ORF Issue Brief No. 440, February 2021, Observer Research Foundation

Table 5.1 DAP-2020 Contents

Sr No	Segment	Content	Chapter in DAP-2020
1	Policy framework	Defence planning as the basis for acquisitions and focus on indigenisation	Preamble & Chapter I
2	Procurement categories	Prioritised and special categories	I, II & III
3	Acquisition cycle	From identification of requirement to award of contract and associated processes	II
4	Other special procedures	Acquisition of systems designed and developed by the Defence Research and Development Organisation (DRDO), Defence Public Sector Undertakings (DPSU) and the Ordnance Factory Board(OFB); Fast Track Procedure; Revitalising Defence Industrial Ecosystem through Strategic Partnerships; Acquisition of Systems Products and ICT Systems; Other Capital Procurement Procedure; and, Procedure for Defence Ship Building	IV, V, VII, VIII, IX, X and XII
5	Miscellaneous features	Standard Contract Document and offsets	VI & Annex E to Ch II
6	Post-contract Management	Administration of contracts	XI

Source: DAP 2020

The planning system, on the basis of which capital procurement is undertaken has been completely changed (Table 5.2). The outcome of these changes can be evaluated only after 5-10 years.

Table 5. 2 Changes in the Planning Structure

DPP-2016			DAP-2020	
Plan	**Period**		**Plan**	**Period**
Long-term Integrated Perspective Plan (LTIPP)	15 years		Integrated Capability Development Plan (ICDP)	10 years
Five years Services Capability Acquisition Plan (SCAP)	5 years		Five years Defence Capital Acquisition Plan (DCAP)	5 years
Annual Acquisition Plan (AAP) – two sections	2-year roll-on		Annual Acquisition Plan (AAP) – four sections	2-year roll-on

Source: DAP 2020

DAP 2020 comprise of five more categories (See Table 5.3) over and above existing prioritised categories. Out of these, the 'Make', 'Innovation', and 'Design and Development' are meant for encouraging design and development. Procurement of any item developed through these categories are to be processed through 'Buy (Indian-IDDM)' or 'Buy (Indian)'[54]. The emphasis of indigenisation as per the new provisions in DAP 2020 need to be strengthened by a comprehensive indigenisation plan which would provide credibility to the indigenisation efforts and facilitate better planning by the industry.

Table 5. 3 : SPM, Leasing, OCPP & Make AND Innovation

Category	Features
Strategic Partnership Model (SPM)	The category intends to facilitate Indian private companies to become system integrators, by allowing them to tie up with approved foreign vendors to supply essential equipment to the armed forces. The private sector is expected to develop an ecosystem consisting of developmental partners and specialised supplies, particularly from the micro, small and medium enterprises (MSMEs).
Leasing	The category, which has two subcategories, Lease (Indian) and Lease (Global), allows the armed forces to possess and operate equipment without having to own them. It avoids payment of upfront capital cost of procurement and involves periodic rental payment.
Other Capital Procurement Procedure (OCPP)	The category facilitates overhaul, major refits, upgrades and replacement of items of by using capital budget.
Make & Innovation	The category has four subcategories: Make-I (Government Funded up to 70%); Make-II (Industry Funded), Make-III and Innovation. Procurement of Make-I/II items post-successful development would be through Buy (India-IDDM) category with ≥ 50% IC; whereas procurement of Make-III items would be through Buy (Indian) with ≥ 60% IC. Prototype development under 'Innovation' would be through: iDEX, Technology Development Fund (TDF) and Internal Servicers Organisations. Post successful development Buy (Indian-IDDM) would be used for procurement of items developed through iDEX and TDF; whereas either Buy (Indian-IDDM) or Buy (Indian) category could be used for procurement of items developed through the Internal Services Organisations.
Design and Development	The category facilitates design and development by the Defence Research and Development Organisation (DRDO), Defence Public Sector Undertakings (DPSUs) and Ordnance Factory Board (OFB). Procurement of successful products would be through the Buy (Indian-IDDM) category.

Source: DAP 2020

[54] Laxman Kumar Behera, "Defence Acquisition Procedure 2020: Imperatives for Further Reforms," ORF Issue Brief No. 440, February 2021, Observer Research Foundation

Procurement categories

The changes made in the procurement categories (Table 5. 4) include replacement of the 'Buy and Make' category by 'Buy (Global-Manufacture in India)', dividing 'Make' category into three sub-categories, and creation of 'Innovation' and 'Leasing' as new categories.

Table 5. 4 : PROCUREMENT CATEGORIES

Hierarchically arranged categories (in descending order of priority)	Special categories
Buy (Indian - Indian Designed, Developed, and Manufactured), or Buy (IDDM)	Make – Make I, II & III Innovation
Buy (Indian)	Strategic Partnership Model
Buy and Make (Indian)	Leasing
Buy (Global – Manufacture in India)	
Buy (Global)	

Source: DAP 2020

Other major changes are that features of the Buy (IDDM) and Buy (Indian) categories have been swapped, requirement of IC has been raised across all categories generally by 10 per cent in the prioritised categories and eligibility of the vendors to participate in the tender (Table 5.5).

Table 5.5 Category-wise IC requirement

Category	Vendors eligible to participate	Indigenous Content
Buy (IDDM)	Indian	Indigenous design and ≥ 50%
Buy (Indian)	Indian	In case of indigenous design ≥ 50%, otherwise≥ 60%
Buy and Make (Indian) (Buy portion may be nil)	Indian	≥ 50% of the 'Make' portion and transfer of critical technologies from the foreign vendors as per the specified range, depth and scope
Buy (Global – Manufacture in India)	Foreign and Indian	≥ 50%
Buy (Global)	Foreign and Indian	Foreign Vendor – Nil Indian Vendor ≥ 30%

Source: DAP 2020

A comparative table of prioritised categories, indigenous content and RFP Toto be issued to Indian or Foreign is brought out below in simplified form.

Table 5.6 Prioritised Procurement Categories and Indigenous Requirement

DPP 2016			DAP 2020		
Prioritised Category	**IC (%)**	**RFP issued to (Indian/Foreign)**	**Prioritised Category**	**IC (%)**	**RFP issued to (Indian/Foreign)**
Buy (Indian-IDDM)	≥ 40% if indigenous design; else ≥60%	Indian	Buy (Indian - IDDM)	≥ 50% and indigenous design	Indian
Buy (Indian)	≥ 40%	Indian	Buy (Indian)	≥ 50% if indigenous design; else ≥ 60%	Indian
Buy & Make (Indian)	≥ 50% in 'Make' portion	Indian	Buy & Make (Indian)	≥ 50% IC in 'Make' portion	Indian
Buy & Make	IC on case-to-case basis	Foreign	Buy (Global-Manufacture in India)	≥ 50%	Foreign /Indian
Buy (Global)	NA	Foreign/Indian	Buy (Global)	Nil for foreign; ≥30% for Indian	Foreign/Indian

Source: DAP 2020

Emphasis on expediting Indigenisation

The DAP comprise of various guidelines for expediting indigenisation in defence sector. The Indigenous content in almost all the categories of the DAP 2020 has been enhanced to 50 percent from the earlier 40 percent. DAP 2020 has also introduced framework for increasing utilisation of indigenous military materials and software with respect to the Indian armed forces. DAP has brought out the procurement of aero-engines and fab manufacturing would be treated on favourable terms. DAP has made a mention of negative import list i.e. details of items banned from import.

Offset Policy Revision

The DAP 2020 has brought out major changes to invigorate the offset guidelines. Revamped guidelines emphasise on investment, technology and export of major platforms. In order to attain these objectives, guidelines for offset obligations, items eligible for offset transactions and multipliers applicable in various situations have been revised. The provisions for offset obligation have been introduced to permit Indian defence manufacturers to receive technologies for which the foreign vendors will now be eligible to receive direct credit. The advanced technologies have been set aside for Defence Research and Development Organisation (DRDO), Defence Public Sector Undertakings (DPSUs) and Ordnance Factory Board (OFB)[16]. The DAP 2020 has taken out offsets from all the ab-initio single vendors cases including acquisitions based on inter-governmental agreement (IGA) and Foreign Military Sales (FMS). This step will significantly reduce offset inflows in future procurement contracts with these entities. This may not be liked by the Indian Offset Partners (IOPs), particularly those who depend on steady and continuous flow of offsets for their business survival.

Leasing

Leasing has been introduced as a new category of procurement. Especially in view of the the budget constraints, the provision of leasing big ticket items, where

payment can be staggered, seems an optimum solution for acquisition of defence capabilities. The real outcome /effectiveness of the lease category can be assessed after its full implementation. The lease procedure is same as in the normal 'Buy' and 'Buy and Make' categories.[55] It is apparent that this procedure is prone to time delays because of protracted negotiations involved.

The guidelines which are specific to India and the insurance cost would add to the extra cost. This may render leasing of any equipment costlier over the longer duration. Further, this may jeopardise India's defence indigenisation efforts. There are guidelines permitting to own the equipment after the lease duration. This may lead to eventual import after the lease thereby may adversely affecting the government's Make in India initiative and Atmanirbhar Bharat Abhiyan.

Additional Chapters

DAP 2020 comprises of twelve chapters in comparison to the seven chapters of DPP 2016. There are five additional chapters enumerating new provisions and clarifying procedures which existed in erstwhile DPP 2016 for attaining Atmanirbharta mission. These additional chapters comprise of **Chapter IV-Procedure for Acquisition of systems designed and developed by DRDO/DPSU/OFB, Chapter VIII-Acquisition of Systems Products and ICT Systems, Chapter IX-Leasing which** facilitates operating defence equipment without owning them, thus substituting huge initial capital expenditure, **Chapter X-Other Capital Procurement Procedure** dealing with procure some of the revenue-oriented 'stores' items by using the capital budget, **Chapter XI-Post Contract Management.**

[55] Laxman Kumar Behera, "Defence Acquisition Procedure 2020: Imperatives for Further Reforms," ORF Issue Brief No. 440, February 2021, Observer Research Foundation

FDI

Foreign Direct Investment (FDI) cap in the defence sector has been raised from early 49 percent to 74 percent under the automatic route.[56] The DAP has included this increase in FDI as a guideline to attract foreign arms manufacturers. This provision is not applicable for procurement under 'Buy (Indian-IDDM)', Make-I, Make-II, Strategic Partnership Model (SPM), Design and Development through DRDO, DPSUs and OFB. These categories would still be subject to the maximum FDI of 49 percent. FDI upto 74 percent is allowed under 'Buy (Indian)', 'Buy and Make (Indian)', and 'Buy (Global – Manufacture in India)' and Make-III only.

Thrust on Expeditious Procurement

DAP 2020 has also made an endeavour to reduce the timelines of procurement processes. Formulation of two main factors Qualitative Requirement (QR) and trial procedures have been streamlined. Procedural changes have been made to provide single stage accord of Acceptance of Necessity upto INR 5.0 billion. In case of procurement under the Fast-Track Procedures (FTP), the delegated powers would now be used to process it, thereby considerably shortening the procurement cycle[57].

Make I, II & III[58]

Introduced in 2006, the 'Make' procedure/category was intended to facilitate the design and development of the prototypes of defence equipment. A new sub-category has now been added to the two that already existed. The essential features of these sub-categories are:

[56] Ministry of Finance, Government of India, "Highlights of Finance Minister's Stimulus Package – IV", May 16, 2020
[57] Laxman Kumar Behera, "Defence Acquisition Procedure 2020: Imperatives for Further Reforms," ORF Issue Brief No. 440, February 2021, Observer Research Foundation
[58] Ministry of Defence, Government of India, Defence Acquisition Procedure 2020

Make-I (government funded): Design and Develoment by the industry with financial support up to 70 per cent of prototype development cost or maximum of ₹ 250 crores.

Make-II (Industry Funded): Design and Development and innovative solutions by the Indian vendors without any government funding.

Make-III: Equipment which can be manufactured in India as import substitution for product support of weapon systems/equipment held by the Services, either in collaboration with, or with Transfer of Technology (ToT) from, the foreign Original Equipment Manufacturers (OEMs).

Incentives for Micro, Small and Medium Enterprises (MSMEs)

In the Make II & III sub-categories, cost not exceeding ₹ 100 crore per year, Projects will be earmarked for the MSMEs. Start-ups will also be eligible to participate in Make II cases. After successful development of the prototype under the first two sub-categories, the indigenously designed and developed equipment with a minimum of 50 per cent IC will be acquired from the successful Development Agencies through the 'Buy (IDDM)' category, and under the 'Buy (Indian)' category for products developed under the Make-III sub-category with a minimum of 60 per cent IC.

Innovation

Objective is to encourage innovations by making use of provisions like Innovations for Defence Excellence (iDEX) Scheme under the aegis of the Defence Innovation Organisation (DIO), Technology Development Fund (TDF) Scheme managed by the DRDO and Indigenous Development by Services.

Other Capital Procurement Procedure (OCPP)

Other Capital Procurement Procedure (OCPP) is based on the erstwhile system Capital Budget Revenue Procedure (CBRP). This is applicable to repetitive expenditure of capital nature meant for the utility of the existing assets. AoN is to be accorded by the Competent Financial Authorities (CFA) as per delegation of powers for capital acquisition.

Analysis

Although issuance of DAP 2020 along with its game changer provisions is a step in right direction to galvanise Indian defence industry, promote indigenisation and procurement, Few additional improvements are recommended to render defence acquisition more efficient faster, and user friendly to the Indian defence industry.

National Security Strategy

In order to ensure clear vision and acquisition planning, it is essential that the government issues a national security strategy, or a defence white paper, at the earliest.

Paucity of Resources

It has been observed in the past that defence procurement planning has gone awry due to lack of adequate resources. To avoid this, costing of both the 10 and five-year plans must be carried out thoroughly, approved and required resources must be allocated. This will provide required push and credibility to the defence planning through resource visibility and accountability of MoD and the armed forces.

Accountability in Procurement

Different procurement functions i.e. Tech specifications, trials, QA, negotiations, vetting and approval of finance angle are dealt by various functionaries working under different departments. The Comptroller and Auditor General of India (CAG) has brought out 55 approval points at 11 different stages of procurement before finalisation of a contract.[59] This multi-layer approval process ultimately results in lack of accountability, delay in procurement and thereby depriving the defence services of desired equipment.[60] The procurement procedures should be simplified and approving heads need to be minimised.

Proficiency/Specialisation in Procurement

As compared to personnel working in acquisition organisation in US, UK and France, the Indian officials lack exposure and skill required for this all important task of defence procurement. Due to lack of professionalism, decision making is poor and often delayed. There is a need a prepare a dedicated cadre for procurement with specialisation in contract preparation, finance, national and international export control laws.

Trimming/merging of Procurement Categories

The DAP has five prioritised procurement categories, apart from three others – Leasing, SPM and OCPP. Adding the 'Make', 'Innovation' and 'Design and Development' procedures, the number of categories and subcategories are around 12. There is a need to simplify few of these categories. Merger of 'Buy (Indian)' and 'Buy (Indian-IDDM)' could be considered. Further, 'Buy and Make (Indian)' and SPM could

[59] "Capital Acquisition in Indian Air Force", Report No. 3 of 2019, Comptroller and Auditor General of India, pp. 31-32

[60] Laxman Kumar Behera, India' Defence Economy: Planning, Budgeting, Industry and Procurement (New York: Routledge, 2021), pp. 103-129.

be merged as objective of these categories is to encourage Indian defence industry as system integrators.

Qualification Requirements

The DAP has emphasised on 'Comparative Analysis of Specifications'. It has been repeated pointed out by CAG that formulation of QRs by defence services has not been professional. Generally, it includes too many parameters and entails lot of delays in procurement. Considering the importance of QRs in ensuring timely procurement, its procedure of preparing QRs need to be more efficient, realistic and highly professional. A dedicated and professional QR department at the apex level need to be set up for inculcating transparency and accountability[61]

Defence Procurement Manual, 2009

Defence Procurement Manual, 2009 (DPM 2009) contains principles and procedure related to procurement of goods and services for the Defence Services, Organizations and Establishments[62]. The manual have been studied and analysed in depth. The major points with respect to amendments/additions in certain provisions of Chapter 15 of DPM 2009 for streamlining and aiding indigenisation process are enumerated below:

Liquidated Damages (LD) At present, the rules for applying Liquidated Damages (LD) on the vendor for indigenous development projects is the same as that for any routine procurement. However, development of military products, especially aviation products, involves highly complex and iterative process, hence there is a need to formulate separate and more relaxed LD clauses for developmental projects to support the development agency. Even though the DPM allows for waiver of LD

[61] "Union Government (Defence Services): Army and Ordnance Factories", Report No. 4 of 2007, Comptroller and Auditor General of India, pp. 10-11.

[62] Ministry of Defence, Government of India, Defence Procurement Manual 2009

clauses on a case to case basis, it invariably becomes difficult to convince the IFA staff and the projects get unduly delayed. For development of complex and technology intensive products, it would be preferable not to have any LD clause in the RFP/ contract to attract potential vendors. For hand holding of Indian developers, EMD, PBG & LD clauses also should not be part of developmental RFP. Even if PBG is mandated, it may be reduced to 5% rather than 10%.

Payment for Short Closure of Project. As of now there is no provision to make payments to the development agency in case development of a product fails. Development of military equipment, especially airborne equipment is a very complex and iterative process involving very stringent qualification and certification requirements and a considerable monetary commitment. In order to keep the firms motivated for participation in developmental projects, it is important to compensate the firm in case of failed development up to the extent the firm has spent money in the project.

Extension of Delivery Period. As per the existing provisions, the maximum period of extension of delivery that can be granted by the CFA under delegated powers should be such that the total period - the original delivery period plus the extension - does not exceed twice the original delivery period. Extensions beyond this period would require sanction of the next higher CFA. Development of military product is an iterative process and requires extensive testing and rework, hence projects are likely to be delayed. It is therefore recommended that a special provision be made for developmental projects wherein CFA should be authorized to grant extension on case to case basis beyond delivery period without LD or any period the CFA feels justified up to, subject to sufficient justifications provided by the development agency.

Engagement with Academia. Lot of impetus is being given to tap the R & D potential of academia for developmental projects. However, there is no standard operating procedure of engagement with these institutes. At present, few academia have come forward for holding hands of BRDs, however as normal vendors. They are required to bid as per DPM 2009 procedure in spite of carrying out feasibility study,

developing design specs and drawings, and have to compete on OTE basis and get the award of contract. For effective utilisation of academic institutes in developmental projects of IAF, a separate SoP needs to be formulated to facilitate participation of these institutes. It is recommended to consider such indigenous developmental cases on LTE / STE basis through academic institutes of repute, especially for critical and complex technology cases where design data is not available and feasibility study has been carried out by academia. Floating the RFPs on OTE basis may result in to bidding by third party who may not be aware of actual requirements.

Definition of Initial Order Quantity. As per the existing provisions of DPM 2009, L1 firm for developmental projects is to be decided on the basis of development cost, including the cost of prototype and the total quantity for which the initial orders are placed. However, the definition of initial order has not been specified in the DPM. The modalities of calculating IOQ has been given in the Manual of Indigenisation which must be included in DPM.As per MoI, initial order quantity may be arrived at based on Immediate urgent requirement (AOG/PHU), 20 % of Schedule of Requirement (SOR) or Annual requirement of the product.

Development on No Cost No Commitment (NCNC) Basis. As per the existing provisions in DPM 2009, any interested vendor may develop a product on NCNC basis, without any commitment for future procurement of the developed item.MOI-2017 Chapter- II Para-11 (e) directs that indigenisation projects are not to be taken up on NCNC basis. Clarity should be there on the contradictory policy stating whether NCNC should be resorted to or not.

Mandatory Participation in Pre-bid Meeting to Qualify for TEC. Participation in pre bid meeting should be made mandatory for developer to participate in development RFP. It has been observed in the past that developers are not participating in pre bid meeting and becoming L-1. This leads to misinterpretation especially in complex cases. Inclusion of accepting the bids only if the developer has participated in the Pre bid where necessary will help in rejection of such infructuous bids at TEC stage itself.

Amendment in Parallel Development Clause. As per DPM, Development contracts may, as far as feasible, to be concluded with two or more contractors in parallel, subject to the other vendor/s agreeing to match the price of L1. Since there is no value specified for the projects, this clause is being insisted upon even for low value items. Hence, to standardise the interpretation of this clause, it is suggested that projects of Rs 1 Cr and above only be made mandatory for inclusion of parallel development contracts in the RFPs. While this clause encourages the placement of parallel contracts, however, it is unlikely that the other bidders will reduce their prices to match it with the L-1 prices, especially when it is known that the full order value/Qty will not be received by them. Hence to enhance the effectiveness of this clause an upward price variation of +10% should be permissible.

AON Sanction without IFAs. The necessity of indigenisation is best known to the indigenisation agency and hence the CFA should be empowered to accord AoN, without the need to involve IFA especially in case of AOG/PHU/Mandatory lines. At the time of EAS, when the actual value of the project is decided, the delegation of financial powers can be applied at that stage, with IFA's concurrence as applicable.

Advance Payments. In the case of development and fabrication contracts or in case of turnkey projects, it sometimes becomes necessary to give an advance to the vendors, especially to financially support them in high-value, complex cases. In such cases it should be ensured that only a minimum reasonable amount, up-to 30% for private firms and up-to 40% for DPSUs, is given as advance at the time of placement of the order. This is line with provisions of GFR 2017.

Bid Evaluation Criteria. In many cases, particularly for complex projects; development cost varies in lakhs among various bidder and hence, becomes the only factor in determination of L-1 vendor, neglecting the future cost (Particularly in cases where IOQ is less).It is recommended to change the bid evaluation criterion from Dev Cost+ Proto Cost + IOQ Cost to Dev Cost+ Proto Cost + IOQ Cost + Discounted Cash Flow for the Forecasted Demand of Four Subsequent Years (LC validity Period-Five Years). The forecasted demand (for four subsequent years) used for bid evaluation will

not be a binding on the Depot for placement of future Supply Orders. The Discounted Cash Flow technique is already used in calculation of L-1 vendor for cases involving AMC and is recommended by DPM. In the present case, it is assumed that the vendor has quoted the future cost based on the cost likely to be incurred by him (per unit) in the fifth year.

Award of Contract on the Basis of Cost and Quality. It is recommended to consider awarding order on the basis of L1 and T1 instead of L1 alone to ensure requisite quality of the product. A suitable formula can be devised for the same. Due technical weightage to be given during technical evaluation based on capability, past record, financial capability etc. and using the points along with cost quoted to arrive at the L1-T1 vendor.

Resultant Single Vendor Situation Cases. Due to complex technology of items to be developed, it has been observed in the past that in few instances resultant single bid situation arises even after publishing the requirement. Clear provision to Process such cases will reduce the time for republishing etc. It is proposed that, if the quoted price is less than AON price and sufficient time has been given for responding to the RFP, PNC/CNC need not be mandatory.

Placement of Direct Order for Indigenous development of an item on DPSU / Govt. Undertaking / Govt. Labs. In cases, where the DPSUs/Govt. Labs etc. responds to an EoI, the lengthy procedure of tendering may not be followed and Direct Supply Order may be placed.

Additional Recommendations for fast track indigenisation

Indigenization cases up-to 25 thousand and 25 Lakhs may be processed through direct order and LTE respectively with vendors of desired capability and targeted expertise to expedite indigenization cases.

AON is generally accorded based on the BQ received at an early stage. However, once the RFP is floated the same has entire testing and validation requirements. The vendors quote based on the Qualification test criteria and acceptance tests. The cost quoted may increase due to the detailed qualitative requirements. It is proposed that Re-AON may be accorded along with EAS and not refer the case for re-tendering.

In-line with the provisions of DPM Para 14.7.1 for Navy, provisions for 20 % additional payment (over and above the approved EAS) must be catered for the requirements of 'Growth of Work' from original work specified in RFP on project of additional requirements sought by the buyer.

DDPMAS

The DDPMAS is a design document production process used by DRDO to develop and document the design of airborne systems and airborne stores. The 2021 version of DDPMAS is an updated and revised version of the 2002 version, and incorporates several improvements and changes based on feedback and experience gained during the last two decades. Some of the key differences and improvements are:

Enhanced documentation: The 2021 version of DDPMAS places greater emphasis on documentation, with more detailed and specific requirements for documentation, including design descriptions, change management procedures, and reviews.

Incorporation of new technologies: The updated DDPMAS includes guidelines for the use of new technologies, including the use of digital tools, virtual and augmented reality simulations, and computer-aided design (CAD) software. This is aimed at improving the accuracy and efficiency of the design process, and reducing the time required for design and development.

Risk management: The updated DDPMAS places greater emphasis on risk management, with more specific requirements for risk identification, analysis, and mitigation. This includes the use of Failure Modes and Effects Analysis (FMEA) and Fault Tree Analysis (FTA) to identify and address potential risks.

Collaboration and communication: The updated DDPMAS emphasizes the importance of collaboration and communication among different departments and stakeholders, with more specific guidelines for communication and collaboration, including the use of project management software and other communication tools.

Quality management: The updated DDPMAS places greater emphasis on quality management, with more specific guidelines for quality control, inspection, and testing. This is aimed at ensuring that the final product meets the required quality standards, and is safe and reliable.

Change management: DDPMAS version 2.0 includes more specific guidelines for change management, with a focus on ensuring that changes to the design are properly documented, reviewed, and approved before implementation.

Overall, the 2021 version of DDPMAS includes several improvements and changes that are aimed at improving the design process, reducing costs, increasing efficiency, and ensuring that the final product is safe, reliable, and effective.

Indigenisation Policy IAF

Manual of Indigenisation-2017 has been issued as a Indigenisation policy for IAF. The manual defines indigenisation as "Ingenious application of available technology in developing import substitutes through a reliable source of supply." Apart from the import substitution, indigenization also aims at ab-initio design, production of systems and technology improvements[63].

[63] https://www.drdo.gov.in/sites/default/files/inline-files/DDPMAS_Ver2pt0Draft1.pdf

Indigenisation can be undertaken by BRDs or any other agency i.e. Public Sector, Private Sector etc. Indigenisation of a defence equipment mandates that at least two sources are completely developed to ensure price competition and avoid dependence on any single source.

HQ MC (Maintenance Command) is responsible for implementation of indigenisation plan of IAF. Directorate of Indigenisation (Dir (lndg)) working under ACAS (MP) is the overall coordinator for issuance of indigenisation policies and follows up on indigenisation cases / higher level coordination with PSUs, CEMILAC and other agencies on behalf of the IAF. Financial sanctions for cases beyond powers of HQ MC for indigenisation effort are progressed by the Directorate.

Command Indigenisation Cell at HQ MC Nagpur exercises functional control and coordinates/ directs the indigenisation effort at each BRD. The Cell provides all support to BRDs for smooth implementation of their indigenisation plan. The Cell processes all cases within financial powers of HQMC, takes up with Air HQs for obtaining all financial sanctions for those beyond HQ MC Powers and interacts with other agencies for help and guidance required by indigenisation section at BRDs. All BRDs have an Indigenisation section/department for executing the assigned indigenisation task. They are the single point of contact for all vendors.

All airborne items need to be certified and approved for airworthiness before use on military aircraft. The authority for approval, however, differs for different items. In cases the item does not affect safety, reliability, maintenance, interchangeability and operational effectiveness, the BRDs may accord approval by locally constituted Self Reliance Committees. For flight/mission critical items, certificate known as Type Approval is issued by the RD, RCMA /CD, CEMILAC to the effect that the store under reference meets all design specifications and test requirements laid down by CEMILAC.

Defence Production and Export Promotion Policy 2020

The Ministry of Defence (MoD) has put out Draft Defence Production and Export Promotion Policy (DPEPP) 2020 for inputs. The draft policy aims at attaining self-reliance and increasing defence exports through galvanising the defence industry. The need for self-reliance or Atmanirbharta has been amply brought out in ongoing Russia Ukraine war. DPEPP is an overarching document with an aim of achieving a defence manufacturing turnover of US$25 Bn including defence exports target of US$5 Bn by 2025. DPEPP has identified specific thrust areas and spelled out strategies to achieve them. The areas identified were Reforms in procurement procedures, Enhancing indigenisation support to MSMEs, Optimising resource allocation for defence (focussed spending), Improving Ease of Doing Business (EoDB) index, Encouraging innovation and R&D in defence, Phased disinvestments DPSUs and corporatisation of OFB, Pushing up and diversify quality assurance and testing facilities, Policies and actions towards export promotion. Draft Defence Production and Export Promotion Policy, 2020 (DPEPP, 2020) is envisaged as an overarching guiding document of the Defence Ministry that aims to provide a focused and structured thrust to defence production capabilities of India[64].

The draft policy endeavours to resolve the constraints faced by the defence industry during the procurement. The draft policy caters for a negative imports list ie the items which will not be imported. Project Management Unit (PMU) is proposed to ensure efficient management during induction after procurement. It has also introduced concept of Technical Assessment Cell (TAC), for assessment of Technology Readiness Levels (TRLs) and identify the industry players as per specialisation and capability. The handholding of the MSMEs and startups is a key objective. it is imperative that the procurement is doubled from the current Rs.70,000 Cr to Rs.1,40,000 Cr by 2025[65].

[64] https://www.iasexpress.net/draft-defence-production-and-export-promotion-policy-2020-features-challenges-way-ahead/accessed on 16 Feb 2023

[65] https://www.ddpmod.gov.in/sites/default/files/DraftDPEPP.pdf accessed on 16 Feb 2023 and 21 Feb 2023

The draft policy advocates the indigenisation of 5,000 imported components for defence equipment by 2025 and a turnover of $25 billion in aerospace and defence goods and services by 2025. At present, the share of domestic procurement in overall defence procurement is around 60%. The draft policy envisages collaboration of DRDO with academia, scientific and industrial establishments for development of advanced defence systems/platforms/materials. Other initiatives are iDEX which cater for incubation and infrastructure support for start-ups in defence and Mission Raksha Gyan Shakti which fosters innovation and technology development. Further, the policy has intended to improve upon the Offset Policy for defence investments and acquisition of critical technology. OFBs and DPSUs will be undertaking procurement preferably from indigenous sources. Disinvestment of DPSUs will be pursued and DPSUs to inculcate maximum usage of modern technologies like AI, IoT, block chain technology etc. The policy envisages streamlining QA processes and Organisational reforms for the Directorate General Quality Assurance (DGQA) and Directorate General of Aeronautical Quality Assurance (DGAQA) with provision for third-party inspection bodies. The testing facilities with defence organisations are planned to be upgraded and provided to private industry utilisation. The policy sets a target of achieving Rs.35,000 crore ($5 billion) of defence export by 2025. Defence attaches have been mandated and supported to promote exports of indigenous defence equipment abroad. Export promotion cell are mandated to promote the exports via coordinated action to support the defence industry. DPSUs and OFBs would be authorised for at least 25% of their revenue from exports[66].

[66] https://www.iasexpress.net/draft-defence-production-and-export-promotion-policy-2020-features-challenges-way-ahead/

Analysis

Improvements/reforms are pre-requisite for an exciting and galvanised indigenous defence industry. Endeavour of Defence Production and Export Promotion Policy, 2020 is to to revolutionise the Indian defence industry.

However, it falls short of the expectations of the private industry and will have to introduce certain improvements to obviate existing issues for placing the Indian defence industry on upward trajectory. There is a need to incentivise the private players for Research and Development and ensure additional allocation of Research and development. Further, Indigenisation should not be at the cost of the country's security interests. Transparency and accountability are must for not compromising the national security.

Joint Venture Guidelines

The main aim of the new Joint Venture Guidelines is to encourage the private sector to enhance sourcing of technologies from foreign companies to facilitate production of defence equipment indigenously. The guidelines brings out the requirement and procedures for the formation of the JV in an efficient and effective manner. The JV policy framework needs overarching reforms. Its major stress is on formalising the outsourcing of the existing orders of the DPSUs to the private sector or the foreign vendors to ensure faster procurements. The policy does not ensure JVs competing for orders on their own strength. The DPSUs have acquired a large number of orders which is not with in their capability to execute within the delivery period. The policy stipulate that the DPSUs retain their 'independent ability and commitment' to meet the defence requirements while forming a JV. Therefore, it is prudent for the DPSU to acquire the technology instead of JV. Further, there is a possibility that a DPSU may be competing with its own JV partner for acquiring orders in case it has the same capability which is against the essence of JV formation.

Make in India

The objective of 'Make in India' mission is to render India a global manufacturing hub and encourage investment, innovation, skill development, protect intellectual property & inculcate an efficient manufacturing infrastructure[67].

The "Make in India" initiative is based on four pillars **New Processes, New Infrastructure, New Sectors and New mind-set envisaged to bring about a revolutionary change in economy, technology and society**.

New Processes: Government of India have initiated various reforms for improving business environment. Efforts are being made to de-license and de-regulate the industry.

New Infrastructure: Adequate infrastructure is essential for development of industry. New infrastructure is coming up in India at a very fast pace and existing infrastructure is being upgraded. Skill development, Innovation, research and development are accorded due priority.

New Sectors: 25 sectors in manufacturing, infrastructure and service activities have been identified for development. FDI has been opened up in Defence Production, Construction and Railway infrastructure.

New Mindset: A paradigm shift in the manner in which Government interacts with industry. This interaction would be more as a partner/facilitator and not regulator.

The Make in India program has been built on layers of collaborative effort aimed at raising the contribution of the manufacturing sector to 25% of the GDP in the coming

[67] https://www.pmindia.gov.in/en/major_initiatives/make-in-india/ accessed on 16 Feb 23

years. It is essential that India must achieve self-reliance in the production of defence equipment to emerge as a major power in the world. 'Atmanirbhar Abhiyan' is expected to help India achieve self-reliance in defence manufacturing[68].

'Atmanirbhar Bharat', 'Vocal for Local', 'Make in India' & 'Self-Reliance' have been stated by the Hon'ble PM as the overarching principle of national policy for India. India's rise as an economic power, huge defence equipment requirements and vibrant industrial base possess the potential to convert 'Make in India' into a reality in defence sector with positive effect on other sectors. **There is an urgent need to augment 'Make in India' through user friendly Defence procurement procedure to facilitate creation of an eco-system where design, R&D, manufacturing, maintenance, upgrade and export capabilities thrive.** 'Make in India' program would foster the capability of Indian industry to design, manufacture and export defence equipment. DRDO, the DPSUs, the OFB must endeavour to increase the share of domestic private industry and indigenous content in our capital procurements indigenous content stipulated in DAP 2020 under Buy (IDDM) category, Buy (Indian) category, Buy and make (Indian) category i.e. >50 per cent. High value items need to be identified with large order quantities over a sustained time period including in the commercial sector. There are tremendous opportunities for up-gradation, Life extension and MRO of both existing and newly developed platforms/systems under the concept of Make in India. This requirement would lead to 75-80 per cent of the procurement by value through Indian vendors, increase the indigenous content, development of niche technologies, enhance defence exports, skill development and employment generation and overall take Indian economy to upward trajectory.

Conclusion

Considering the deliberations above, it can be stated that 'Make in India' concept is highly relevant and effective in revolutionising the defence manufacturing industry. Private industry should be trusted, proactively engaged and pursued by allocating

[68] https://www.pmindia.gov.in/en/major_initiatives/make-in-india/ accessed on 16 Feb 23

projects in areas of their specialisation. The private industry should be facilitated by incentivising, providing test facilities owned by the govt. agencies and necessary hand holding. There is need to slowly and steadily enhance the indigenous content (IC) in the procurement. 'Make in India' has the potential to design, development and manufacture of defence equipment / systems / platform. Urgent policy reforms commensurate to spirit of 'Make in India' program are required to support the private industry, including MSME.

Response Analysis of Questionnaire and interpretation of Data

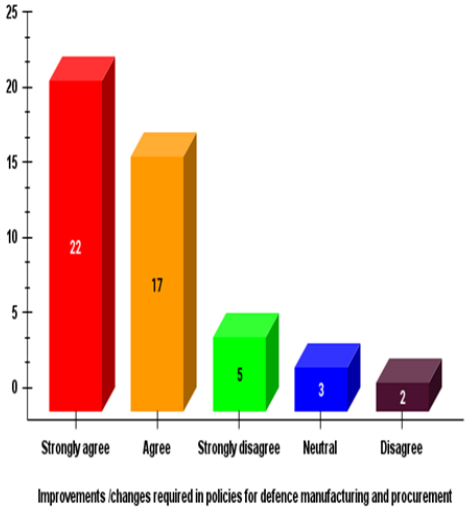
Firstly, a detailed questionnaire was prepared and in depth discussion held with officials at Air HQ and MoD. Based on the feedback received a simplified questionnaire was prepared on Google Forms and sent to different cross section of stake holders comprising of MoD, Armed forces, civil officers, RCMA, Private industry, HAL and DRDO as a e-questionnaire/Google Form. A Total of 63 responses were received. Break up of responses as per their background of respondents is placed at Table 6.1. A copy of detailed questionnaire and simplified questionnaire are placed at Annexure I and II respectively.

Table 6.1: Sample Survey

Variable(organisation)	Count	Percentage
Indian Air Force	20	33.8
Indian Army	8	13.5
DRDO	3	5
Indian Navy	3	5
Private Industry	6	10.16
Ministry of Defence	6	10.16
CBI	1	1.6
CRPF	1	1.6
Indian Railways	1	1.6
Coast Guard	1	1.6
Govt (Misc)	9	15.25
	59	

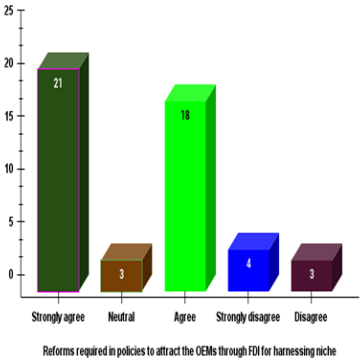
8. **Improvements /changes required in policies for defence manufacturing and procurement**

45.1% respondents expressed 'Strongly agree' as the option ie improvement/changes are required in policies for defence manufacturing and procurement.33.3 % respondents expressed 'Agree' as an option. A meagre 3.9% disagree and 11.8% strongly disagree that improvements/changes are required in the policies. The evidence clearly brings out that there is a need for reforms in the policies for defence manufacturing and procurement.



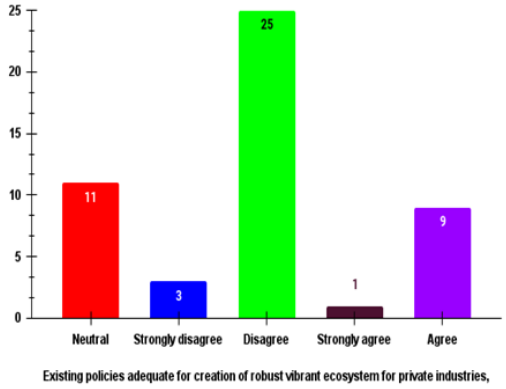
9. Reforms required in policies to attract the OEMs through FDI for harnessing niche technologies

41.2% respondents expressed 'Strongly agree' as the option ie Reforms required in policies to attract the OEMs through FDI for harnessing niche technologies. 37.3 % respondents expressed 'Agree' as an option. A meagre 5.9 % Disagree and 9.8 % strongly disagree that improvements/changes are required in the policies. The evidence clearly brings out that there is a need for policy reforms to attract the OEMs through FDI for harnessing niche technologies.



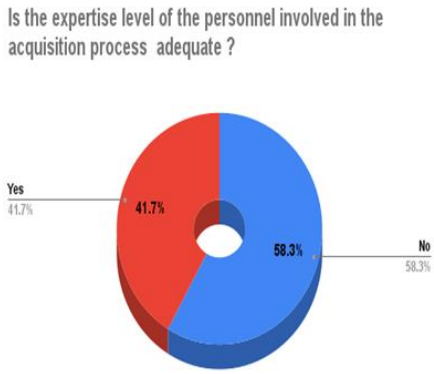
10. **Existing policies adequate for creation of robust vibrant ecosystem for private industries, start-ups, and large-cap industries to participate in the Atma nirbhar Abhiyan**

5.9 % respondents expressed 'Strongly disagree' as the option ie existing policies are adequate for creation of robust vibrant ecosystem for private industries, start-ups, and large-cap industries to participate in the Atma nirbhar Abhiyan.52.9 % respondents expressed 'Disagree' as an option. A meagre 5.9 % Disagree and 9.8 % strongly disagree that improvements/changes are required in the policies. The evidence clearly brings out that there is a need for reforms in the policies for creation of robust vibrant ecosystem for private industries, start-ups, and large-cap industries to participate in the Atma nirbhar Abhiyan.



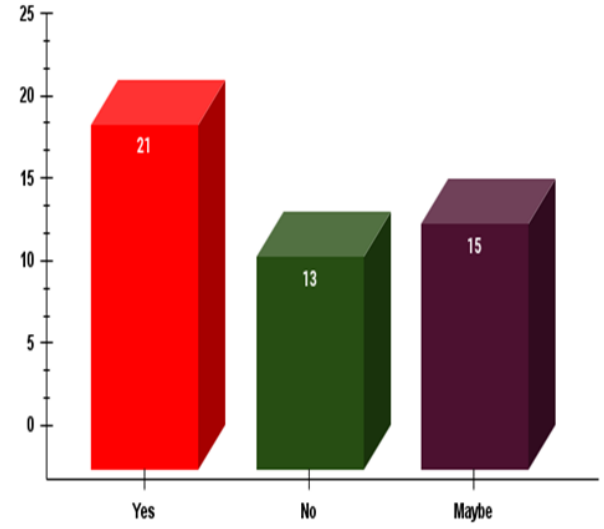
12. Is the expertise level of personnel involved in the acquisition process adequate?

A majority of respondents 58.3% respondents expressed 'No' as the option i.e. expertise level of personnel involved in the acquisition process is adequate. This clearly brings out necessity to enhance the expertise level or specialisation of personnel involved in the acquisition process.



13. Additional appellate organisational structure or any regulating authority like TRAI etc for redressal of grievance in cases related to indigenisation.

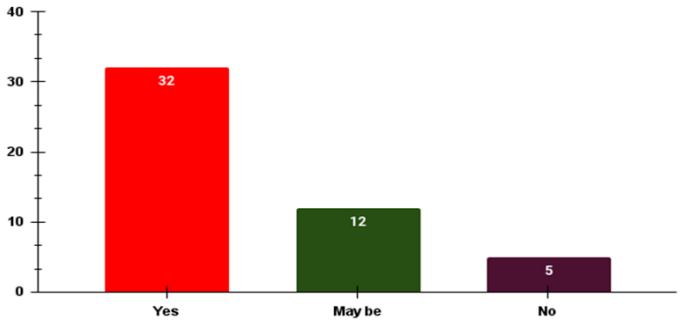
43.1% respondents expressed 'Yes' as the option i.e. Additional appellate organisational structure or any regulating authority like TRAI etc for redressal of grievance in cases related to indigenisation. 31.4% respondents expressed 'May be ' and 25.5 % respondents expressed 'No' as the option This clearly brings out the need for Additional appellate organisational structure or any regulating authority in cases related to indigenisation.



Additional appellate organisational structure or any regulating authority like TRAI etc for

14. Improvements required in the policy with respect to Airworthiness certification and quality

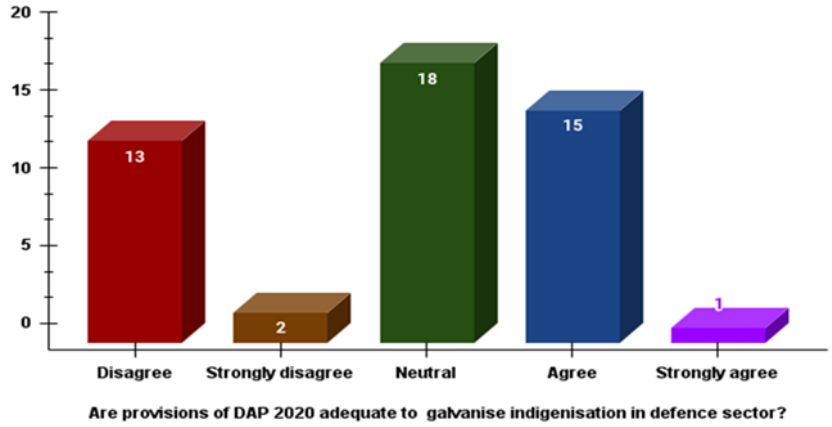
6.7 % respondents expressed 'Yes' as the option i.e. Improvements required in the policy with respect to Airworthiness certification and quality. 23.5 % respondents expressed 'May be' and 9.8 % respondents expressed 'No' as the option. This clearly brings out the need for Improvements required in the policy with respect to Airworthiness certification and quality.



Improvements required in the policy with respect to Airworthiness certification and quality

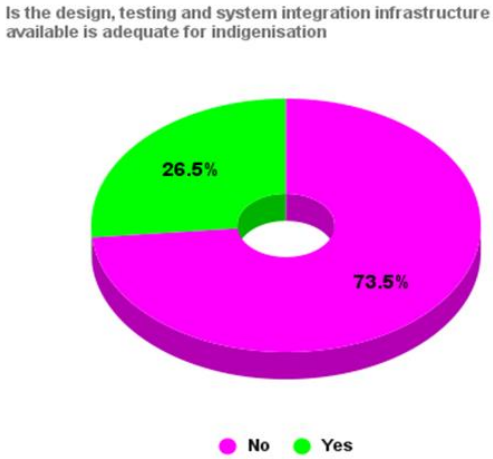
15. Are provisions of DAP 2020 adequate to galvanise indigenisation in defence sector?

3.9 % respondents expressed 'Strongly disagree' as the option ie provisions of DAP 2020 are adequate to galvanise indigenisation in defence sector. 27.5 % respondents expressed 'Disagree' as an option and 35.3% expressed 'Neutral' that improvements/changes are required in the policies, probably due to lack of awareness and knowledge about provisions of DAP 2020 . The evidence clearly brings out that there is a need for further reforms in the guidelines enumerated in DAP 2020.



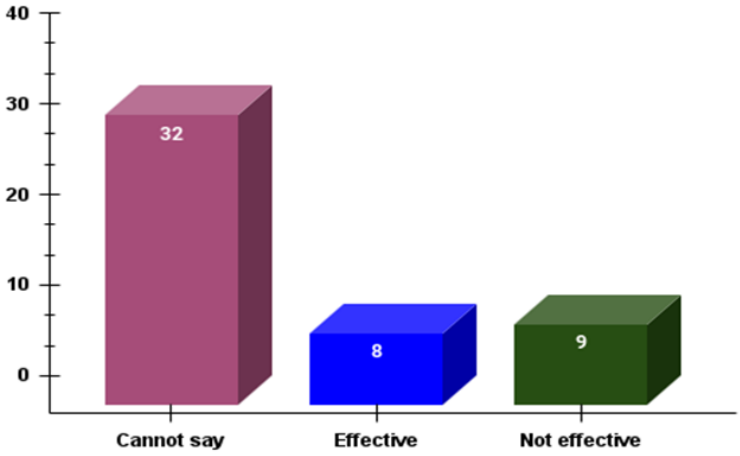
17. **Is the design, testing and system integration infrastructure available is adequate for indigenisation?**

A majority of respondents 73.5% respondents expressed 'No' as the option i.e. design, testing and system integration infrastructure available is adequate for indigenisation. This clearly brings out necessity to enhance the design, testing and system integration infrastructure and make it available for private sector.



18. Efficacy of the existing 'Offset' guidelines and management structure.

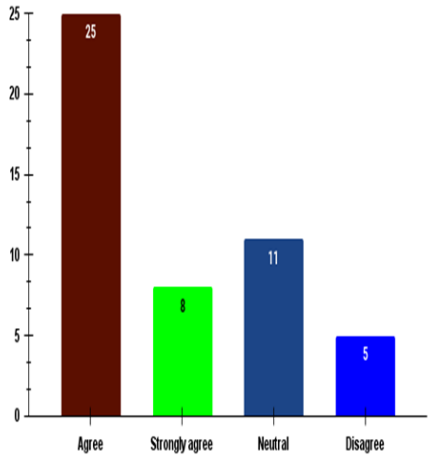
64.4 % respondents expressed 'Cannot say' as the option with respect to Efficacy of the existing 'Offset' guidelines and management structure. 16.9 % respondents expressed 'Non effective' and 15.7 % respondents expressed 'No' as the option. This clearly brings out the need for reforms required in the policy with respect to offset guidelines and management structure.



Efficacy of the existing 'Offset' guidelines and management structure

20. Delays in progress of indigenisation cases due to the present policies

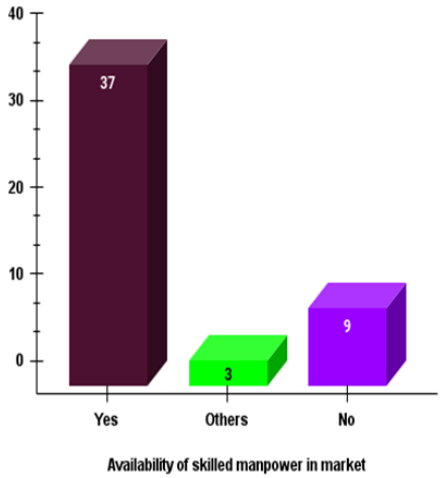
50 % respondents expressed 'Agree' as the option i.e. there are delays in progress of indigenisation cases due to the present policies. 19 % respondents expressed 'Strongly Agree' as an option. A meagre 8.6 % Disagree and 22.4 % are neutral. The evidence clearly brings out that there is a need for reforms in the policies to remove all bottlenecks in indigenisation.



Delays in progress of indigenisation cases due to the present policies

22. Availability of skilled manpower in market.

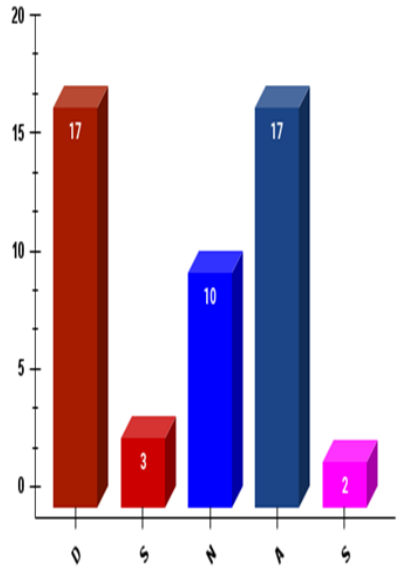
A majority of respondents 72.9% respondents expressed 'Yes ' as the option i.e. skilled manpower is available in the market. 22% respondents expressed 'No'. This clearly brings out that there is skilled manpower available in the market.



Availability of skilled manpower in market

23. Efforts undertaken by the Government adequate to enhance skilled manpower.

35.6 % respondents expressed 'Agree' as the option i.e. there are Efforts undertaken by the Government adequate to enhance skilled manpower. 37.6 % respondents expressed 'Disagree' as an option. A meagre 5.1% strongly disagree, 3.4% strongly agree and 18.6 % are neutral. The evidence brings out that more efforts are required by the government to enhance the skilled manpower.



Efforts undertaken by the Government adequate to enhance skilled

7. What are the factors in your view affecting indigenisation in defence production?

i. Government policies, lack of integrated manufacturing eco system, disconnect between defence and industry in understanding each other's requirement.

ii. No indigenous IPR on advanced systems. Services demand ready/proven technology which is costly to develop in anticipation, using own source of funds. GSQR are based on foreign Original Equipment Manufacturers (OEM) brochures but not on actual Operational Requirement.

iii. Uncertainty in future orders, inadequate funding and dearth of skilled manpower.

iv. High initial investment with limited sales prospects, non-availability of technology and problems in technology absorption.

v. Poor Research and Development capability of Indian institutions.

vi. Lack of funds.

vii. Lack of metallurgy technology and defence research.

viii. Lack of user friendly procurement policy favouring Make in India.

ix. Government policy, financial markets, Technology development

x. Lack of participation of Private Sector, Sluggish PSUs, Poor R&D infrastructure

xi. Lack of cutting edge Technology and user friendly procurement procedures

xii. Government Policies, Technological capabilities, Fund availability, Private sector participation, Geopolitical Situation, Economy of Country, Skilled work force and Logistics Support.

xiii. Lack of indigenous manufacturing capability and low incentivisation of Private sector.

xiv. Lengthy procedures for procurement, Complex Proprietary Software Dependent Equipment, Complex Technology Intensive Hardware, Stringent and Cumbersome Certification processes

xv. Too much dependence on foreign vendors.

xvi. Non availability of technology.

xvii. Non availability of Test facilities for private sector.

xviii. Secured market access.

xix. Lack of user friendly policies.

xx. Market, funds and policies.

xxi. Non availability of design data and materials.

xxii. Umbilical cord cannot be severed from designer and manufacturer.

xxiii. Government policy IPR protection laws to protect, Lack of ToT.

xxiv. Lack of focus in private companies to invest in innovation in defence sector.

xxv. Non availability of core technology.

xxvi. Poor quality of indigenous products and poor documentation.

xxvii. Factors affecting in a positive way is the Govt's present insistence of going Atma nirbhar. The negative aspect is various cumbersome policies and procedures involved in certification and qualifications especially in airborne stores.

xxviii. Policy, R&D, testing facilities

xxix. Lack of Know-How / technical drawings leading to lack of knowledge of the complete functioning of the critical component / PCB /module being indigenised. This results in failure during trials. Only form and fit function are attained and functioning is compromised. Also, firm doing R&D is not confident of orders thereafter.

xxx. Lack of Transparency, technology and policy issues

xxxi. Lack of certainty and volume of business. IAF wants indigenization for the sake of it just to may be showcase somewhere that it has indigenized so many things. We do not get any committed business forecast.

xxxii. Lack of funds.

xxxiii. The quality of raw material in local market

xxxiv. Lack of investment in research and development

xxxv. Process and procedure

xxxvi. Technical expertise

xxxvii. L1 determination

xxxviii. Technology gap, reluctance to spend on R&D

xxxix. Lack of appropriate technology and assured market for the manufacturer

xl. Policies, Limited requirement, Integrations of indigenisation facilities

xli. Poor Transfer of technology, low MoQ, inadequate experience of private defence industry, lengthy certification process, inexperienced certification professionals.

xlii. Lack of manufacturing capability in the niche technologies

xliii. Ignorance about the technological advancements in pvt industries

xliv. Lack of knowledge sharing between industry and user requirements.

11. What are various means for meeting the challenges and way ahead for the accomplishment of Atma nirbhar Abhiyan?

i. Identification of requirements and undertake joint production.

ii. Broader industry participation. Advance planning with vendor interactions to discuss develop solution. Diligent work on LTPP .

iii. Ease of doing business.

iv. R&D support by government, export permits for indigenous defence equipment, tax benefits for manufacturers.

v. Change in Mindset and trust the private sector.

vi. Improved policies.

vii. Allow FDI in defence sector with conditions of manufacturing in India. Make DRDO accountable.

viii. Providing sops for new entrepreneurs.

ix. Investment in R&D, change policy, relax monetary regulations, encourage foreign investors, make business reforms, help start ups.

x. Investment in R&D, Public Sector need to align with the requirements.

xi. R& D, hand holding and trust.

xii. Invest in R& D and Encourage Private Partnership.

xiii. Funds, policies and hand holding.

xiv. Promotion of private sector participation, Increased investment in R&D, Simplified Procurement Procedures, Make in India Program, Promoting Exports, Public Private Partnership to be promoted, Strengthening the Supply Chain.

xv. Strategic partnerships/ JVs with Pvt industry, both R&D as well as Make in India.

xvi. Industry must be supported by Govt. Defence must have a strategic partnership with Indian Vendors and OEMs. MoUs and confirm orders must be given with Stringent SLAs

xvii. Enhanced focus on Research and development.

xviii. Change in education system and investing in R& D.

xix. Policy incentives for MNCs to manufacture in India and our forces to buy indigenous products, some fraction of the total requirement, to foster local industries.

xx. Good policies and good execution of policy.

xxi. Create market, provide funds, provide subsidies, provide technology.

xxii. Strong R&D set up.

xxiii. Define the meaning of Atma nirbhar in an Indian context. Making everything in India by an Indian industry is not the real meaning. Even USA doesn't do it but they are self reliant.

xxiv. Own design can only provide true Indigenisation.

xxv. Assured orders by Government.

xxvi. Attractive investment opportunities.

xxvii. Good quality state of art products with good after sales support.

xxviii. Ease of setting up business, undertaking testing and qualification, hand holding and creating a fostering ecosystem for start ups to establish and grow.

xxix. Ensure that SMEs don't get over-run by red-tape and bigger corporates. Keep the playing field level.

xxx. Public / private Ecosystem with technology and capability are required to be either identified or created and nurtured till successful.

xxxi. Long term plan and incentives for achieving indigenisation.

xxxii. For all indigenization give minimum business guarantee. Business volume and years of commitment for that business.

xxxiii. Allocate more funds in defence budget.

xxxiv. Required more focus & investment on R&D

xxxv. Invest in Research and Development. Harness young minds who are part of brain drain with adequate incentives. Incentivising start ups. De-risking investments by private companies through insurance.

xxxvi. The main challenge is development of technology and its certification, qualification for airborne usage.

xxxvii. Encourage innovation.

xxxviii. The inception of atma nirbhar bharat, should not only be limited to spares but to complex project too where, advance payments may be made for development from user angle as it requires great energy and research.

xxxix. Boost required towards JVs, involvement at Govt level to ease out TOT.

xl. Reduce bureaucracy in decision making and permitting private industry to interface directly with services.

xli. CEMILAC should be under DMA for better coordination.

xlii. Integrating facilities, CEMILAC advisory rep in indigenisation process.

xliii. Establishing a fair process accepted by all stakeholders and use PDCA cycle for continuous improvement of established processes

xliv. Formation of exclusive teams including financial advisors, Enhanced financial powers to CFAs, Conduct of pvt industry interactions at regular intervals and facilitating means to clear bottle necks, Easy certification procedures and facilitation

xlv. Formation of Military Industrial Complex.

xlvi. Engagement of OEMs to set up shops with Indian firms.

xlvii. Amendments to procurement policies. Freedom to R &D organisation for vendor selection.

CHAPTER VI

CONCLUSION AND RECOMMENDATIONS

Chapter VI

Conclusion and Recommendations

We have discussed in the earlier chapters present status of Atmanirbhar Abhiyan, Vocal for Local, Make in India or Self Reliance which has been stated by the Hon'ble PM as the overarching principle of national policy for India, Indigenisation in defence sector and various issues and challenges affecting the indigenisation. We also deliberated on the growth and development of defence industry in India over the years, long term requirement of the defence forces based on threat perception, continuously advances in technology, various policies impinging on the manufacturing and procurement of defence equipment, indepth analysis of policies, initiatives /reforms by the government to galvanise the industry, improvement required in the policies and few case studies of advanced nations.

India has emerged as the largest importer of defence equipment in last five years and considering the projected requirement of equipment and upgradation of existing assets, there are huge opportunities for the Indian defence industry. For progressively reducing the imports, increasing the exports of defence equipment and move towards achievement of complete self reliance, it is essential that a an all encompassing strategy be formulated and implemented for ensuring that 'Make in India' is a resounding success. This strategy should comprise of far reaching reforms in the policy, methodology and means with an aim to enhance participation of the Indian private industry in defence sector and progressively increase the indigenous content in defence equipment produced by the Indian industry.

Inspite of several initiatives undertaken by the government, self-reliance in defence production has not been achieved. A big challenge remains in simplified implementation of the policies and proper interpretation of these policies at various levels including IFAs. Therefore, taking into consideration feedback/various inputs from officials working in service HQs, MoD, DRDO, DGAQA and defence industry

have been compiled and the reasons for slow pace of indigenisation in defence manufacturing have been analysed. An attempt has also been made to understand the applicability of 'Atma Nirbhar Abhiyan' for defence manufacturing and procurement. Constraints, effectiveness and user-friendliness of the existing policies, procedures and guidelines for the manufacture and procurement of defence equipment and acquisition of niche technologies have also been studied and analysed. **Based on the analysis, following suggestions are made for improvements /changes in the existing policies for manufacture and procurement, measures required to attract the OEMs through FDI for harnessing niche technologies, creation of a robust vibrant ecosystem for private industries, start-ups, and large-cap industries to proactively participate in the Atma nirbhar Abhiyan.**

i. MoD comprises of various departments like Acquisition Wing, HQ IDS, DDP, MoD (Fin). DRDO undertakes R&D with no discussion/taking into consideration, the requirements of the three services. All these departments work in silos with no single objective – meeting the needs of the defence forces. It is recommended to set up an organisation working under defence minister to identify the requirements of the three services, work out framework for meeting these requirements, engage private industry, research establishments, innovators, foreign companies, transfer of technology, academia, coordinate indigenisation efforts, collaboration, licensing and legislations for encouraging defence Industry. This organisation should act as a single point of contact and nerve centre for all activities related to procurement and manufacturing of defence equipment.

ii. Till date four lists comprising of 411 items have been released by the Government whose import would be stopped in a staggered manner. It is imperative that Indian industry is geared up to produce advance and superior technology defence equipment. For this to become a reality Indian defence Industry must develop and grow at a fast pace. They need to inculcate complete digitisation in design and manufacturing, adopt Artificial Initiative,

Big data analytics, cloud computing, additive manufacturing and Industrial Internet of Things.

iii. The weapons and equipment in the 'negative list' are to be monitored meticulously. Fast track and focussed development of these identified equipment is to be taken by the defence industry, however, without compromising on op preparation and national security.

iv. Necessary policy reforms/improvements as enumerated at chapter V need to be initiated at the earliest to galavanise the Indian defence industry in order to achieve ultimate objective of Atmanirbhar bharat in defence sector. A focussed approached is to be adopted for development of innovativeand advanced technology with adequate funding.

v. The government has indeed undertaken various initiatives with respect to policy guidelines and framework. However it must be understood that development of spares in aviation is a complex affair and require identification of material, design, manufacturing and elaborate trials or airworthiness certification. Complete procedure must be made simple and

uniform so as to enthuse synergy in testing, quality assurance and certification work.

vi. There is a need to ensure that the private industry engaged in development and manufacturing of defence equipment is supported by adequate finances and assurance of the follow-on orders for the indigenised items.

vii. The defence forces and Indian defence industry must jointly work out requirement of weapons system required for operational preparedness considering the geo-strategic scenario and work out mechanism for their development. This strategy should comprise of both filling the gaps and upgradation of existing system and phsing out of obsolete system with no market support.

viii. The budget must cater for additional funds for fostering the private industry, MSMEs, innovators whether individuals or institutionalised and start ups to achieve this ambitious objective of self reliance.

ix. The long term requirement of the three services and export potential is to be taken as the basis for development of resources and capacity by the Indian defence industry.

x. Academia should be closely associated with the defence services and industry. The requirement of the industry and the game changing technologies sought by the three services to be projected to the academic institutions. They must be encouraged to develop these technologies.

xi. A number of skill training programmes in latest manufacturing techniques e.g. precision casting, 3D printing, advanced Machining on CNCs etc are being conducted by the Ministry of MSME. Skill development cell should

endeavor to utilise these skills for the indigenisation in Defence Aerospace. Efforts also need to be put for skill development in the fields of Artificial Initiative, Big data analytics, cloud computing, additive manufacturing and Industrial Internet of Things for overall advancement and rendering the system more efficient and productive.

xii. Although, The foreign direct investment (FDI) limit in the defence manufacturing sector has been hiked from 49% to 74% via the 'automatic route', the government reserves the right to review any foreign investment that affects, or may affect, national security. Further, there are no provision for FDI exceeding 49% for big ticket projects, further limiting the production avenues for foreign companies. It is doubtful that foreign companies would invest more than 49% for undertaking low budget manufacturing projects. These issues needs to be addressed with a more user friendly policy for India.

xiii. It is essential that a level playing field be provided as per the policies and guidelines for all the MSMEs with the DPSUs and foreign OEMs in order to encourage their participation and involvement in Make In India mission.

xiv. Technology Perspective and Capability Roadmap – 2018 (TPCR- 2018) has been prepared to guide the industry in planning or initiating technology development, partnerships and production arrangements. However, although the document gives numbers, the time frames for development have not been specified. For better planning and assimilation by the industry, the time lines should be clearly brought out in the document.

xv. The present DDPMAS has been adopted from the US, UK and other foreign countries certification standards. The CEMILAC needs to have an airworthiness policy which caters to Indian environment. The policy should cater to standards and not be focused on CEMILAC certification. The standards should be made by CEMILAC as per Indian conditions. At present all the powers are centralized and needs to be decentralized. DDPMAS needs

to incorporate and resolve issues like development and certification methodology for airborne components through additive manufacturing, Standardisation of template for Test Schedules, Sharing of data on items for which Type Approval / Provisional Clearance issued and Feasibility to provide permanent RCMA rep for BRDs, Design authority to BRDs. The role of Certifying agencies need to be made more accountable in helping rather than becoming a stumbling block.

xvi. Indian Air Force (IAF) has done a good job by compilation of its requirement for indigenisation and placed in the public domain along with various procedures for certification/QA. Same need to be vigorously pursued by the IAF by organising seminars/symposiums regularly in order to engage the private industry. At the same time, the private industry should proactively approach IAF for clarification, in case any and identification of items/systems as per their specialisation.

xvii. Indigenization cases up-to 25 thousand and 25 Lakhs may be processed through direct order and LTE respectively with vendors of desired capability and targeted expertise to expedite indigenization cases.

xviii. AON is generally accorded based on the BQ received at an early stage. However, once the RFP is floated the same has entire testing and validation requirements. The vendors quote based on the Qualification test criteria and acceptance tests. The cost quoted may increase due to the detailed qualitative requirements. It is proposed that Re-AON may be accorded along with EAS and not refer the case for re-tendering.

xix. In-line with the provisions of DPM Para 14.7.1 for Navy, provisions for 20 % additional payment (over and above the approved EAS) must be catered for the requirements of 'Growth of Work' from original work specified in RFP on project of additional requirements sought by the buyer.

xx. The Defence Production and Export Promotion Policy 2020 (DPEPP 2020) would require few improvements to obviate existing issues for placing the Indian defence industry on upward trajectory. There is a need to incentivise the private players for Research and Development and ensure additional allocation of Research and development. Further, Indigenisation should not be at the cost of the country's security interests.

xxi. 'Make in India' concept is highly relevant and effective in revolutionising the defence manufacturing industry. Private industry should be trusted, proactively engaged and pursued by allocating projects in areas of their specialisation. The private industry should be facilitated by providing test facilities owned by the govt agencies and necessary hand holding. There is need to slowly and steadily enhance the indigenous content (IC) in the procurement. 'Make in India' has the potential to design, development and manufacture of defence equipment / systems / platform.

xxii. As of now there is no provision to make payments to the development agency in case development of a product fails. Development of military equipment, especially airborne equipment is a very complex and iterative process involving very stringent qualification and certification requirements and a considerable monetary commitment. In order to keep the firms motivated for participation in developmental projects, it is important to compensate the firm in case of failed development up to the extent the firm has spent money in the project.

xxiii. Development of military product is an iterative process and requires extensive testing and rework, hence projects are likely to be delayed. It is therefore recommended that a special provision be made for developmental projects wherein CFA should be authorized to grant extension on case to case basis beyond delivery period without LD or any period the CFA feels justified up to, subject to sufficient justifications provided by the development agency.

xxiv. Presently, there is no Standard Operating Procedure (SoP) for engagement with academia to tap the R & D potential of for developmental projects. At present, academia are required to bid as per DPM 2009 procedure in spite of carrying out feasibility study, developing design specs and drawings, and have to compete on OTE basis and get the award of contract. For effective utilisation of academic institutes in developmental projects of IAF, it is recommended to consider such indigenous developmental cases on LTE / STE basis through academic institutes of repute.

xxv. To ensure efficient implementation of defence procurement planning, costing of both the 10 and five-year plans must be carried out thoroughly, approved and required resources must be allocated. This will provide required push and credibility to the defence planning through resource visibility and accountability of MoD and the armed forces.

xxvi. Different procurement functions i.e. Tech specifications, trials, QA, negotiations, vetting and approval of finance angle are dealt by various functionaries working under different departments. This multi-layer approval process ultimately results in lack of accountability, delay in procurement and thereby depriving the defence services of desired equipment. The procurement procedures should be simplified and approving heads need to be minimised.

xxvii. As compared to personnel working in acquisition organisation in developed nations like US, UK and France, the Indian officials lack exposure and skill required for this all important task of defence procurement. Due to lack of professionalism, decision making is poor and often delayed. There is a need to prepare a dedicated cadre for procurement with specialisation in contract preparation, finance, national and international export control laws.

xxviii. The DAP has five prioritised procurement categories, apart from three others – Leasing, SPM and OCPP. Adding the ‘Make’, ‘Innovation’ and ‘Design and Development’ procedures, the number of categories and subcategories are

around 12. There is a need to simplify few of these categories. Merger of 'Buy (Indian)' and 'Buy (Indian-IDDM)' could be considered. Further, 'Buy and Make (Indian)' and SPM could be merged as objective of these categories is to encourage Indian defence industry as system integrators.

xxix. Private industry should be trusted, engaged and pursued as per their specialisation and core competency. Testing infrastructure with Government sector must be made available to the private sector in a proactive manner for expeditious trials. The private industry is quite capable of undertaking indigenous development. Government may fund some of the infrastructure and testing requirements for private industries and enter into Inter governmental agreements with friendly foreign countries for aiding JVs. Putting all government funded testing facilities under single body with reps from private industries is also one of the initiatives which would help.

xxx. In the case of development and fabrication contracts, it sometimes becomes necessary to give an advance to the vendors, especially to financially support them in high-value, complex cases. In such cases it should be ensured that only a minimum reasonable amount, up-to 30% for private firms and up-to 40% for DPSUs, is given as advance at the time of placement of the order. This is line with provisions of GFR 2017.

xxxi. During discharge of offset obligations, there should be a more robust mechanism of monitoring the progress as per laid down terms and conditions of quality, mandate and timelines. Any delay or deviation in these parameters will jeopardise the objective and render complete effort meaningless without any real benefits (especially in case of technology being provided through offset becomes obsolete).

xxxii. For Transfer of Technology (ToT), timelines should be firm and stringent with a robust feedback and execution mechanism. Intellectual Property Rights of the foreign vendors as well as Indian developers in case of Joint Ventures.

xxxiii. Towards strengthening Research and Development in Defence, the allocation to DRDO has been enhanced by 9%, with a total allocation of Rs 23,264 crore in BE 2023-24. The budget for Defence R&D in India is just 0.8% of GDP (6.3% of Defence Budget) when compared to advanced countries where it is in the order of about 3%. India spends a measly 6 percent of the defence budget on R&D compared to China's 20 percent and US' 12 percent. Even the total share of general R&D expenditure as percentage of the Gross Domestic Product (GDP) is miniscule as compared to other nations. There is an urgent need to enhance the R&D budget to 2-2.5% of the GDP in order to provide required momentum to the domestic manufacturing in defence sector.

xxxiv. All out efforts must be taken to give fillip to the defence exports. A huge export market is available owing to the deficit in manufacturing capacity of developed countries. Export of weapons has to be pursued aggressively too, so that spare capacities can be utilised, especially in the private sector. This will help drive down India’s own acquisition cost and also fund research and development to make the next generation of weapons for the Indian armed forces.

xxxv. DRDO labs need to partner/collaborate with the private defence industry till the domestic industry set up their infrastructure. Research can be conducted jointly under the technical supervision of DRDO labs. The private sector needs to invest much lesser cost if they collaborate and hire the Test/trial facilities of Government organisations.

xxxvi. After study/analysis of policies pertaining to indigenous defence manufacturing and procurement of various developed nations countries it is seen that their policies have been formulated specific to their circumstances. For example, US provides us an apt example how private industry need to participate and invest in the R&D. From Russia there are no major takeaways. UK has a policy of retaining a major share in the defence manufacturing industries which are major players in this vantage sector. Further, UK has commenced opening up defence procurement to the extent possible in order to inculcate competitive pressure.

Here it is pertinent to note that in US, Department of Defence interacts with private industry through the National Defence Industrial Association (NDIA),similarly UK also has National Defence Industries Council (NDIC) which is the forum for deliberations between the Government and Industry on defence industrial policy, industrial strategy and acquisition. France has an organisation General Directorate for Armament (DGA) as an interface between the Armed Forces and the defence Industry. DGA engages in procurement, R&D and production of arms DGA. Israel provides a system in which education and communication between the engineering schools is paramount for a military professional staff and industry.

Conclusion

Achieving Atmanirbharta through indigenisation in Aerospace and Defence manufacturing and procurement is paramount for India to regain its past glory and move ahead towards its aspiration of reaching status of super power. For achieving a surprise element and a credible deterrent towards hostile nations, development of superior indigenous technology, customisation to suit our geographical and climatic conditions, innovative and out of the box thinking is essential. Indigenous production of defence equipment has economic, technological and philosophical ramifications. The 'Make in India' program calls for revolutionising the complete private sector and augmentation of public sector dealing with defence production. At present, Aviation industry base is short of meeting the Self-Reliance target. India have earned the dubious distinction of largest importer of defence systems in the world in last one decade. To achieve self-reliance through indigenisation we need to align our policies and each one of us have to contribute in making this noble mission a resounding success. The study has examined the existing policies which affect the indigenisation and brought out the above recommendations as a way ahead to address the shortcomings in the system and make the country a self- reliant in the Military Aviation and Aerospace industry.

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Annexure -1

Questionnaire

Interaction with Experts from the Air HQ, DRDO, DDP and MoD

'ATMA NIRBHARTA' THROUGH INDIGENISATION: A STUDY OF MANUFACTURING AND PROCUREMENT POLICY IN DEFENCE SECTOR

(a) What are improvements /changes required in policies for defence manufacturing and procurement, attract the OEMs through FDI for harnessing niche technologies, create a robust vibrant ecosystem for private industries, start-ups, and large-cap industries to participate in the Atma nirbhar Abhiyan?

(b) What are various means for meeting the challenges and way ahead for the accomplishment of Atma nirbhar Abhiyan?

(c) What are the shortcomings of policy on Foreign Direct Investment (FDI) and amendments required for the defence sector?

(d) What are the improvements required in the policy with respect to Airworthiness certification and quality?

(e) Any specific or perceived reasons for the delays in progress of any cases due to the DPP.

(f) What are any positive aspects of DAP 2020 and any further more improvements required?

(g) Is the expertise level of the personnel involved in the acquisition process is adequate ? Suggestions for improvement in their proficiency in handling procurement cases

(h) Any requirement for additional appellate organisational structure or any regulating authority like TRAI etc for redressal of grievance in cases related to indigenisation.

(i) How to build indigenous capability in the private sector in Aerospace industry?

(j) Suggestions for galvanizing R&D in defence sector.

(k) What are the measures to expedite/enhance indigenisation of equipment for defence sector?

(l) The development methodology for LCA have resulted in excessive delays. An alternative development model may be suggested by DRDO to ensure timely completion of future programs?

(m) What is the efficacy of the existing 'Offset' guidelines and management structure?

(n) Comments on MoD (DDP) as a 'single window' for according industrial licenses for defence production and FDI?

(o) Suggestions on utilisation of design, testing as system integration infrastructure established by the DPSU and Indian Air Force for utilisation by private industry ?

Annexure –II

Questionnaire

ATMA NIRBHARTA' THROUGH INDIGENISATION: A STUDY OF MANUFACTURING AND PROCUREMENT POLICY IN DEFENCE SECTOR

Dear Sir / Madam

1. I am doing a dissertation on the above mentioned topic in Indian Institute of Public Administration, New Delhi. The research objectives and questions are given in succeeding paragraphs.

2. In the last few years, Govt. of India has introduced a number of measures to enhance the participation of Indian industry in Defence Production. Procedures have been put in place to give impetus for MSMEs and Start-ups to enter into Defence manufacturing and timely induction of equipment into Indian Armed Forces. However, in spite of several initiatives undertaken by the govt., self-reliance in defence production has not been achieved. A big challenge remains in simplified implementation of the policies and proper interpretation of these policies at various levels including IFAs. Therefore, there is a need to study the constraints and how effective and user friendly are the existing policies, procedures and guidelines for the manufacture and procurement of defence equipment and acquisition of niche technologies. This study aims at analyzing the policies for defence manufacturing and procurement and make suggestions for improvements /changes, measures required to attract the OEMs through FDI for harnessing niche technologies, create a robust vibrant ecosystem for private industries,start-ups, and large-cap industries to participate in the Atma nirbhar Abhiyan.

3. Keeping in view the above concerns, the following objectives have been set up for the study:

(a) To study the reasons for slow pace of indigenisation in defence manufacturing.

(b) To identify constraints in policies for defence manufacturing and procurement.

(c) To understand the applicability of 'Atma Nirbhar Abhiyan' for defence manufacturing and procurement.

(d) To recommend actionable measures to meet the exigencies, fostering 'Atma Nirbhar Abhiyan' in defence sector.

4. I request you to kindly fill up the form and provide your valuable input.

Air Cmde Sandeep kumar VSM

* Mandatorily Required

1. Name of the individual /organisation/company

*

2. Registration ID/where ever applicable

*

3. Address

*

4. Year of inception

*

5. Annual Turnover

*

6. Number of regular employees

*

7. What are the factors in your view affecting indigenisation in defence production ?

*

8. Improvements /changes required in policies for defence manufacturing and procurement

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree

9. Reforms required in policies to attract the OEMs through FDI for harnessing niche technologies

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree

10. Existing policies adequate for creation of robust vibrant ecosystem for private industries, start-ups, and large-cap industries to participate in the Atma nirbhar Abhiyan

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree

11. What are various means for meeting the challenges and way ahead for the accomplishment of Atma nirbhar Abhiyan?

12. Is the expertise level of the personnel involved in the acquisition process adequate ?

- Yes
- No

13. Additional appellate organisational structure or any regulating authority like TRAI etc for redressal of grievance in cases related to indigenisation.

- Yes
- No
- Maybe

14. Improvements required in the policy with respect to Airworthiness certification and quality

- Yes
- No
- May be

15. Are provisions of DAP 2020 adequate to galvanise indigenisation in defence sector?

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree

16. Suggestions on creating partnership with public and private industry, at the initial stages for developing systems/platforms for defence, with an aim to imbibe concurrent design and engineering

17. Is the design, testing and system integration infrastructure available is adequate for indigenisation

- Yes
- No

18. Efficacy of the existing 'Offset' guidelines and management structure

- Very effective
- Effective
- Cant say
- Other:

19. Please sequence the following measures to expedite/enhance indigenisation of equipment for defence sector in decreasing order

(a) Review of policies for galvanizing private sector

(b) Availability of funds

(c) Research and Design establishment

(d) Integration facilities

(e) Infrastructure

(f) Availability of Testing facilities

20. Delays in progress of indigenisation cases due to the present policies

- strongly agree
- Agree
- Neutral
- Disagree
- Strongly Disagree

21. In your opinion what else can government do expedite Atma Nirbhar mission with respect to defence sector

22. Availability of skilled manpower in market

- Yes
- No

Other:

23. Efforts undertaken by the Government adequate to enhance skilled manpower

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree