

## **Make in India initiative of Defense and Aerospace Manufacturing with special reference to Atmanirbhar Bharat**

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### **Abstract**

Since the Government allowed defense product and spare parts manufacturing to private sector as well in January 2002 and has given 100 percent private equity with 26 per cent FDI (Foreign Direct Investment), it is considered as revolutionary change in policy, especially for make in India and skill India programme. This initiative helps in employment generation by providing specific skills through training for young employees. Indian defense is the second largest forces in the world. During emergency situations like war we cannot depend upon foreign countries for Complex Military hardware. Therefore, rapid progress in Make in India and developing skills in defense sector related to Cyber security and manufacturing of Quantum Communication are picking up. India is spending nearly 2 per cent of country's total GDP on Defense, instead of spending this amount on import market it can be utilized in indigenous production of weapons, India is building them indigenously with Transfer of technology (TOT) with assistance from other defense companies from foreign countries. GOI has set a goal to achieve turnover of 25 Bn US dollar which includes export of 5 Bn in Aerospace and Defense goods service by 2025. The value of defense export during the financial year 2021-22 has been INR 12815 crore. The paper tries to make the reader understand the basis of promoting Make in India and skill India in defense sector which embraces one of the significant portion of our budget. This conceptual study also sheds light on the pace of improvement of our economy by defense sector by building it as a strong industry through export market. The paper

discusses how it helps to increase security of the country along with economic development by taking the live case examples of INS Vikrant 2022 and HAL Tejas which is one of the great initiatives of Atmanirbhar Bharat of Government of India Initiative.

**Keywords :** *Make in India, Skill India, Defense, Aerospace, Atmanirbhar*

## **Introduction**

Make in India is the Government of India's plan intended to boost the emerging new domestic manufacturing sector and also bring investment into the country. The Make in India initiative was launched by the Prime Minister in September 2014 as part of a set of nation-building initiatives. It has a positive impact on private and public sectors of nation Devised to transform Indian defense industry from import market to export market, provide employment opportunities to youth, develop skills and learn global design through transfer of technology and create manufacturing hub, Make in India was a timely response to a critical situation in the 21<sup>st</sup> century. The value of defense export for fiscal year 2021 and 2022 is around 12815 crores.

## **Brief Literature Review**

The literature review for this study on the Make in India initiative of Defense and Aerospace Manufacturing with special reference to Atmanirbhar Bharat reflects the opinion and Knowledge of various experts based on their experience. In order to validate the importance of this study, the following various literature has been reviewed to get research gaps. Experts in the industry pronounce manufacturing with transfer of technology as the core of a country's economy Development and job creation and development of skills.

Gosh, (2015) Articles shades light on the importance of manufacturing in home country. The experts give instance of other western and Asian countries like Germany, UK, USA and South Korea and china has improved their economy by manufacturing products in home country.

Dr. K. V. Ramana (2015) "The article entitled "Make in India Illusion or Possible Reality Project?"

"This paper covers challenges and drawbacks that Make in India initiative has to navigate through set of problems and the different approach of experts either supporting or criticizing this initiative. These threats faced by domestic companies.

Azar shaikh (2016): This paper covers the importance of the make in India initiative. This mission has potential to change country from import market to export market and make India has a defence hub. This will act as potential game changer for India. Now country can manufacture art of mean machine in India and it will guide other sectors that make in India has vast potential.

Laxman Kumar Behara (2020): This paper says that the biggest threat for "Make in India" is lack of solid institution which don't have long term road map or vision to monitor activity at foundation level. We need to concentrate on developing skills students and making them aware of modern technology. For instance, while the armed forces are enthusiast about acquiring equipment in the shortest possible timeframe without being too concerned about where it is acquired from, the Defense Research and Development Organization (DRDO), the premier R&D agency of the Ministry of Defense (MoD), seems content with endless design and development efforts, Research and development has to develop product in short time and speed up the process of induction which helps in growth of domestic defence industry.

Dhruva Jaishankar (2019) A Home defence industry is a very critical objective for any nation given its security environment and strategic objectives. India has one of the highest defence budgets and a long history of defence industrial manufacturing. However, the country remains heavily reliant on defence imports, particularly for major platforms, while its own exports are extremely meagre. Although several high-level committees have been established to address the problem of defence industrial indigenisation, very few of the necessary steps have been taken.

Suchitra Karthikeyan (2022) pushing for Atmanirbhar is crucial for defence. This article shows the impact of home-grown weapons by giving an instance of Ukraine and Russia's war. During an emergency we cannot depend upon foreign equipment. Countries may increase prices or may not supply equipment in the necessary timeframe. So the government has stressed a renewed push for indigenous manufacturing of defence machines. This can be proved by the recent addressing of the ongoing army commanders conference in 2022. The MOD said, "It's our whole government's stand to ensure the availability of the best weapons, equipment, and camouflage clothing to our troops who are fighting weather, extremists, and hostile forces." He said that in the years 2021–2022, Rs 40,000 crore worth of contracts by the army are being awarded to Indian vendors."

Richard A. Bitzinger (2013) This article's briefs about the problems and struggles of India, after China India possess the most largest and ambitious defence industry in Asia – Pacific region instead of becoming exporter of defence equipment still India is importing weapons. When we go through the struggles of Indian Industries we come across certain problems like structural operating procedure of OFB and state companies which are lazy to meet their target and no questioning is done, lack of proper research and development, improper budget allocation, corruption in army and MOD, cultural and infrastructure problem

### **Objectives of the study**

- To discuss how the 'Make in India mission' of the government of India helps in skill development of the young generation.
- To study 'how Make in India' promotes employment opportunity in defence and aerospace sector
- To understand overall economic growth from the defence and aerospace sectors under the Make in India initiative.

### **Research Methodology**

The study includes the various data collected from secondary data sources. The data has been collected from various research papers, Newspapers, Literature reviews, various social media outlets, and Government websites.

### **Impact of Make in India initiative to society with reference to defence and aerospace industry**

Narendra Modi, the Prime Minister of India, launched the initiative Self-Reliant India in Mid-May of 2020 to promote Indian products in the global supply chain market and enable self-reliant in the defence sector, which is very crucial in emergency situations like war. The campaign of Make in India or Atmanirbhar aims to boost the skills of various Indian private players in industry. Examples include Kalyani, Larsen Tubro, Economic Explosives, Muniton India and Yantra India Limited. Defence manufacturing is considered a vital part of our business as it provides huge outreach to friendly countries and our trusted partners by way of joint production of military hardware through technological transfer and skill increments for employees

as they prepare for future manufacture of defence products. India recently in its 2022 defence expo showcased only made in India equipment's in accordance with self-reliant theme prime minister Narendra modhi opened the event by noting that India exported 13000 crore rs in defence in FY 2022 while this is encouraging we have to analyse how this has shown significant impact on nation and how well India has become self-reliant .75 nation ,1340 Indian firms joined FY 2022 defence expo 400 MOU signed more than 53 African nations and Indian Ocean region plus conclave appeared which is a message to enemy country ,Africa is big market for India, so India trying get African countries attention ,this kind of events give more exposure to start-ups and promote banning of import items in which country is already self –reliant and create global supply chain and give job opportunities and educational institute like IIIT has Memorandum of association with DRDO and HAL and also with foreign institutes like Dasault and Hanwa defence 2022 is expected to bring business of 1.5 lakh crore rs to India.

### India's progress has a defence manufacturing

DRDO and other government and private companies show their products which are developed with extensive research. Few products of Indian companies are

**1. INS Vikrant:** In 1999, Government of India sanctioned the construction of an indigenous aircraft carrier, under the name INS Vikrant, under the 71 Air Defence Ship (ADS). At that time, the fleet of combat Sea Harrier fleet which has capacity to take off vertically without the requirement of any runways are to be retired the urgency for next generation aircraft carrier that would carry more modern jet fighters. In early 2001, Cochin Shipyard Limited (CSL) made a design which represent a graphical portray of 32,000-tonne STOVAR (Short Take-Off but Arrested Recovery) design carrier with a pronounced ski jump technology. The ministry of defence announced Cochin shipyard has L1 bidder and approved amount I in January 2003. By then, model of a 37,500-tonne carrier to operate the soviet made Mikoyan MiG-29K and mig 29 UPG. India opted for a three-carrier fleet consisting of one carrier battle group stationed in west and east side of seashore , and a third carrier held in has emergency reserve in order to continuously protect both external enemy and to keep track on maritime boundaries and from pirates and provide rescue mission and helping hand mission outside and inside country.

In August 2006, Chief of the Naval Staff Admiral Arun Prakash quoted that Final revisions to the design increased the displacement of the carrier from 37,500 tons to over 40,000 tons. The length of the ship also increased from 252 metres (827 ft) to 262 metres (860 ft).<sup>1</sup> The indigenous aircraft carrier INS *Vikrant* is 262 metres (860 ft) long and 62 metres (203 ft.) wide, and displaces about 45,000 tonnes (44,000 long tons; 50,000 short tons). It features a STOVAR configuration with a ski-jump. The deck is designed to enable aircraft such as the MiG-29K to operate from the carrier. It will carry nearly 29 to 30 aircraft and supporting frigates like talwar and vikramditya will accompany vikranth, it is powered by four General Electric LM2500+ gas turbines on two shafts, generating over 80 megawatts (110,000 hp) of power. The gearboxes for the carriers were designed and supplied by Elecon Engineering

The ship's combat management system (CMS) was designed by Tata Power Strategic Engineering Division in collaboration with Weapon and Electronics System Engineering Establishment and MARS, Russia. It is the first CMS developed by a private company for the Indian Navy, and was handed over to the Navy on 28 March 2019. Becoming third and first home made carrier which took 9 years but given more exposure for ship building techniques to Indians, given opportunity to many original equipment's manufacturers and micro small and medium enterprises and generated employment opportunities' to youth of country. According to navy sources the home made carrier has 76% Indigenous content 150 kilometres of pipes, 2000 valves, generator can provide electricity to the city of Kochi.

**2. HAL Tejas:** Combat aircraft can be categorized into three categories, light weight, medium weight, and heavy weight fighter jet. HAL Tejas is light weight delta wing supersonic combat aircraft which can fire Indian and many western weapons. It can fire laser guided ammunition, and BVR missiles (behind visual range missiles) 45 % of Tejas made up of composite material which is very hard to detect. It has given opportunity to many small scale and medium scale industries to manufacture its sub component parts like fuselage from VEM technologies and dynamite Industries which gave them experience in building fighter jets. Tejas has 3 variants MK1 MK1a and MK2 India recently ordered 40 Tejas Mk1 and all 16 IOC and 16 FOC Tejas delivery has been completed again India ordered nearly 80 Tejas MK1a configuration worth up to 48000 crore rs considered as one of the biggest government deal Tejas also has potential customers like argentine, Philippines, Malaysia and Egypt and also training fighter jet program of US

**3. ATAGS:** The Advanced Towed Artillery Gun System (ATAGS) project was started in 2013 by DRDO to replace older guns in service in the Indian army with a modern 155mm artillery which has an auto loader and can also fire guided ammunition even though technology has been designed by DRDO. This guns were manufactured by Kalyani group and Tata advance system. ATAGS and Dhanush artillery guns were the first homemade artillery which is considered has world class weapons the requirement exceeds up to 1750 which will be procured either ATAGS or Kalyani's new artillery which plays significant role in providing security to country instead of looking towards foreign weapons

**4. Amogh 3 ATGM:** Amogh is 3<sup>rd</sup> generation anti-tank guided missile developed by BDL joint venture of Tangbo and BDL which can take out any tanks by laser guided or heat signature. it can be configured to various Indian platforms like light combat helicopter (prachand) and rudra attack helicopter and talks with Boeing to integrate this missiles in apache heavy weight attack helicopter and ground soldiers can fire this missiles by tripod launcher.

**5. Prachand helicopter :** LCH light combat helicopter is first homemade light combat helicopter which is only helicopter in the world that can land at highest battle ground at siachien glacier the need for this helicopter aroused during the kargil war in1999 where India didn't have well equipped helicopters to reach high altitude it was designed based on Indian made helicopter Dhruva 15 limited series production unit has been delivered army and air force may order nearly 120 these machines to fight in naxal inflicted and border area along LOC and LAC

### **Key defence private and public manufacturer**

1. **HAL:** Hindustan Aeronautics Limited is an Indian state owned aerospace and defence company, main branch and headquarter in Bangalore, India. Started on 23 December 1940, HAL is one of the oldest and largest aerospace and defence manufacturers in the world today. Hal started licensed production of Harlow PC-5, Curtiss P-36 Hawk and Vultee A-31 Vengeance for the Indian Air Force. HAL now has 11 dedicated Research and development (R&D) and new radar testing center's and 21 and 4 sub division units spread across India. HAL is governed by a Board of Directors appointed by the chief of India army, Government of India. Common products manufactured by Hal are Light combat helicopter, AL34 engine, HTT40 trainer aircraft and many sub parts and arms for other nation it includes SU 30 MKI from Russia with transfer of technology.
2. **Kalyani group:** Kalyani is an Indian corporate giant which focuses on steel industry automotive and non-automotive recently after government gave access to private industry into defence sector, Kalyani from 2014 has achieved significant milestone in this industry. Their products like Kalyani M4 mine protected vehicles have been selected for Indian soldiers in UN mission and high altitude

areas like Ladakh and western border. They offer products like artillery armoured vehicles, ATGM, small combat drone’s engine, Garuda artillery etc.

3. **Larsen and Tubro:** Indian company which has won several defence contract and start building weapons in India, recently acquired K9vajra is manufactured by L&T they also know for quick delivery of their product before schedule date they also have their home grown products like heavy class ships, sub components and howitzers etc. It has provided jobs for nearly 337000 peoples.
4. **SSS Defence:** Stumpp Schuele & Somappa Defence (SSS Defence) is an Indian company that produces military small arms. It is a subsidiary of Stumpp Schuele & Somappa Springs. Its current focus area , ammunition and accessories related to small arms, recently they have won contract to upgrade ak47 rifles of Indian special force equipment to modern standard and they have chance of winning Indian made sniper contract with their viper and carbine deals.
5. **Tata defence systems:** TASL entered into a joint-venture with Sikorsky Aircraft Corporation to produce the S-92 helicopter in India for the army, navy civil and military markets. The initial estimation was to have a US\$200 million manufacturing plant operational in Hyderabad by 2010. As production began, the first S-92 cabin was delivered in November 2010, and capacity was expected to increase to 36–48 cabins a year. By the end of July 2013, assembly of 39 cabins had been completed. They have won contract to manufacture c295 cargo transport of Spain in 2021 there products like loitering ammunition and Tata WHAP, and artillery guns have been already inducted.
6. **Economic Explosive Limited:** Economic explosive company Incorporated on 16th august 1995 they are into manufacturing of explosive ammunition, Indian Homemade MLRS (multiple launch rocket system rockets were manufactured by Economic explosive limited. They also won contract to manufacture 10, 00000 hand grenades for military use.

#### Revenue generated by few defence companies

| Name                      | Specialization                        | Revenue (As of 2020, except DRDO) | Operating Income (As of 2020, except DRDO) | Employees (As of March–April 2019, except Goa Shipyard) | owned   |
|---------------------------|---------------------------------------|-----------------------------------|--|---|---------|
| <u>Bharat Dynamics</u>    | <u>Ammunition and Missile systems</u> | ₹3,095.2 crore (US\$430 million)  | ₹2,828.8 crore (US\$400 million)           | 3,030   | Private |
| <u>Bharat Electronics</u> | <u>Avionics and Radar</u>             | ₹32,920 crore (US\$4.6 billion)   | ₹12,480 crore (US\$1.7 billion)            | 9,612   | private |

|   |  |  |                                   |                   |         |
|---|--|--|-----------------------------------|-------------------|---------|
| <u>Bharat Earth Movers</u>                            | <u>Transport and Earthmoving Equipment</u>             | ₹3,077.4 crore (US\$430 million)                               | ₹153.20 crore (US\$21 million)    | 7,185             | Private |
| <u>Defence Research and Development Organisation</u>  | Research and Development                               | Annual Budget of 2021-22 of ₹11,375.50 crore (US\$1.6 billion) | Unavailable                       | 30,000            | State   |
| <u>Garden Reach Shipbuilders &amp; Engineers</u>      | <u>Shipbuilding and Ship Design</u>                    | ₹1,658.79 crore (US\$230 million)                              | ₹225.20 crore (US\$32 million)    | 2,100             | State   |
| <u>Goa Shipyard</u>                                   | <u>Shipbuilding</u>                                    | ₹1,071.76 crore (US\$150 million)                              | ₹264.92 crore (US\$37 million)    | 1472 (March 2020) | State   |
| <u>Hindustan Aeronautics Limited</u>                  | <u>Aerospace manufacturer and Defence manufacturer</u> | ₹21,522.07 crore (US\$3.0 billion)                             | ₹3,960.57 crore (US\$560 million) | 28,345            | State   |
| <u>Mazagon Dock Limited</u>                           | Shipbuilding   | ₹4399.16 crores (US\$640 million)                              |                                   | 9,000             | State   |
| <u>Mishra Dhatu Nigam</u>                             | <u>Metallurgy</u>                                      | ₹747 crores (US\$110 million)                                  |                                   | 852               | State   |
| <u>Utkarsha Aluminium Dhatu Nigam Limited (UADNL)</u> | <u>Metallurgy</u>                                      | ₹2,000 crores  |                                   | 380               | state   |
| <u>Cochin Shipyard Limited</u>                        | <u>Shipbuilding</u>                                    | ₹28,745 crore (2017–2018, US\$370 million)                     |                                   | 12,000            | State   |

### **Challenges for Make in India with reference to**

- Inadequate data due to secrecy
- Lack of proper transfer of technology
- Corruption
- Extensive testing of Indian made weapons by army
- Slow Induction procedure

### **Findings of the study**

- Opportunity for Indian defence companies to expand their business and helps to contribute for modernization in armed forces
- Creates awareness about Homemade weapons that are necessary in standoffs
- Through continuous foreign investment, It helps to have good diplomatic and economic relations with other countries
- Employment opportunities' are multiple and open doors without any barrier
- Contributes for skill development of the Young generation and provides awareness of modern technology

### **Conclusion**

In the end, when we glance at Make in India initiative under India has Improved rapidly in the field of manufacturing of defence products with transfer of technology and homemade products, generated employment opportunity and helps to improve skills of employees but we have long way to completely rely on our equipment still we import majority of weapons from Russia, and improvement of defence sector also shows hard power of country and helps to improve diplomatic relations with other countries, The tax reliefs given to start ups and MSME's will boost sustainable employment and the quality of start-ups in the design led manufacturing sector . The Make in India campaign aims to place India on the world map as a manufacturing hub and give global recognition to the Indian economy. India's ranking among the world's 10 largest manufacturing countries has improved by three places to sixth position in the coming years as per estimations.

### **References**

- Dr. K. V. Ramana "Make in India dream or Possible Reality Project?" International Journal of Academic Research, April June, 2015
- Priyanka Yadav " Make in India an initiative for development"Vol.12 NO1-2,018:P.22-27
- Dhruva Jaishankar "The indigenization of defence industry" Brooking Institution India centre 2019
- Handbook of statistics on Indian economy, reserve bank of India 2017

Suchitra Karthikeyan "What are the key defence project under Make in India scheme" THE HINDU updated  
April 26 2022 11:39IST

Richard A.Bitzinger Indian Defence industry: struggling with changes" Oxford Academics published on  
2013

<https://doi.org/10.1093/acprof:oso/9780198092384.003.0005> (last browsed on 24-10-22)

<http://www.makeinindia.com/eodb> ( Last browsed on 23-10-2022)

<http://www.larsentoubro.com/> (Last browsed on 23-10-2022)

<https://www.sssdefence.com/> (Last browsed on 23-10-2022)

<https://www.makeinindia.com/about> (last browsed on 23-10-2022)

<http://hal-india.co.in/> ( Last browsed on 23-10-2022)

<https://mod.gov.in/> ( Last browsed on 23-10-2022)