Bharat's Leap

From Import Dependence to Atmanirbharta in Defence Equipment Manufacturing

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The anarchical nature of the international system and the frequent disruptions in the global supply chain, has pushed Bharat, or India, into charting a new course in the defence sector. This is spearheaded by its 'Atmanirbhar Bharat' (Self-Reliant India) initiative of 2020, wherein, focus is on giving impetus to the growth story of over 140 crore Indians. Currently thus, exponential changes have been witnessed particularly in the defence sector. India has started making sophisticated weapons indigenously, and under the leadership of Prime Minister Narendra Modi, India has overcome its strategic hesitancy and technological backwardness in the defence manufacturing sector. India's defence exports have shot up by 2300 per cent in the year 2022–23, as it now exports a wide array of weaponry to over 85 countries in the world. Considering such remarkable improvement and self-reliance of its defence infrastructure, India is today turning into a net security provider at the international platform. This article seeks to comprehensively analyse India's path of progress from being the largest

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importer of arms towards being self-reliant and an active security provider in the world.

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Introduction

The onslaught of COVID-19 pandemic and the resultant disruptions in the global supply chain, followed by the fomented 'great power' competition in the global platform, have pushed Bharat, or India, into charting a new course in the defence sector. This is spearheaded by its 'Atmanirbhar Bharat' (Self-Reliant India) initiative of 2020, wherein, the focus is on giving impetus to the growth story of over 140 crores Indians.[1] Through this initiative, Prime Minister Narendra Modi urged the country to 'Make in India' with a purpose of 'Make for World'. The initiative is thus about improving India's competitiveness through deeper integration into the global value chain. Turning crisis into opportunity has thus been the brand equity of the Prime Minister who urged people in less unequivocal terms to turn COVID-19 pandemic into an opportunity. He exhorted fellow citizens to utilise this time of crisis to be 'vocal for local' and be self-reliant.[2] Currently thus, exponential changes have been witnessed particularly in the defence sector, among others. India has started making sophisticated weapons indigenously, and ensuring swiftness in its implementation. New Delhi has issued a negative arms import list, whereby, the listed items cannot be imported from foreign countries anymore. Further, in the financial year 2023–24, India planned to spend a whopping amount of Rs 1.71 lakh crores (around US$ 21.1 billion) on the purchase of defence equipments. However, what is even more impressive is that 99 per cent of the purchase will be sourced from Indian industries.[3] This becomes significant particularly because, India figures as one of the largest arms importers in the world, accounting for 11 per cent of the total global value.[4]

Foreign dependence for weapons is thus being lowered as a top priority by the Government of India.[5] The buck doesn't stop here though. India has overcome its strategic hesitancy, and has also overcome technological backwardness in the defence manufacturing sector. Its defence exports have shot up by 2300 per cent in the year 2022–23, particularly at a time when Chinese exports of arms have come down by 25 per cent in the same year. India now exports a wide array of weaponry to over 85 countries in the world, which include 'BrahMos' and 'Akash' missiles, 'ATAGS artillery guns',

'Pinaka' multi barrel rocket launchers, 'Tejas', Advanced Light Combat Helicopters, Donnier 228 aircraft, 'Teevra' 40 mm guns, radars, simulators, etc.[6] Thus, India's defence expenditure on foreign defence equipment has come down from 46 per cent to 36.7 per cent in the period 2018–22.[7] Considering such remarkable improvement and self-reliance on its defence infrastructure, India is today starring at becoming one of the major players in defence manufacturing and export[8] on the international platform; also while announcing that it is not a disruptive power but a stabilising power. This article seeks to comprehensively analyse India's path of progress from being the largest importer of arms towards being self-reliant and an active defence equipment manufacturer in the world.

A Prelude to India's Defence Journey

India's defence structure has its origins in ancient times when monarchs kept armies in place to defend themselves. But after India got its independence from the British in 1947, it inherited a fragmented military system, which necessitated the need for a robust defensive system, primarily because of the threats posed by partition and the amalgamation of the military forces of princely states.[9] The 1962 Sino-Indian conflict and hostilities with Pakistan since 1947 have served as a catalyst for the advancement of India's defence capabilities, which have eventually culminated into the emergence of indigenous defence research and development of institutions within the country.[10] Likewise, the continuing dispute and proxy wars with Pakistan and the ongoing tensions along the Line of Actual Control (LAC) with China point out the importance of maintaining vigilant defence preparedness. Thus, modernising the armed forces is one of the main issues facing India's defence sector. Here on, India's defence sector has evolved significantly over the years, driven by technological advancements, strategic relationships with global and regional powers and enhancement in the indigenous manufacturing capabilities.

One of the key components of India's efforts to upgrade its defence is the integration of cutting-edge technologies, for example, the creation of domestic missile systems, like the Agni series and BrahMos, is a testament to India's technological superiority in the defence industry.[11] Moreover, initiatives by the Defence Research and Development Organisation (DRDO) and 'Make in India' have strengthened indigenous defence manufacturing capabilities. Further, partnerships with international defence businesses and the formation of public–private partnerships have made it easier to

transfer technology and knowledge, which encouraged innovation and indigenisation in the defence industry.[12] There is an enormous opportunity to boost domestic manufacturing and lower reliance on imports through the 'Atmanirbhar Bharat Abhiyan' which aims to promote self-sufficiency across sectors, including defence.[13]

Furthermore, it is anticipated that India's defence partnerships and strategic de-hyphenated alliances with the world and regional powers like the United States (US), Russia, Israel and France will grow stronger, which would further promote technology transfer of critical components, expand the area of collaboration through joint ventures between defence manufacturing companies of countries concerned and increase the number of cooperative projects taking place like of 'Research & Development'. It is expected that expenditure in cutting-edge areas like Artificial Intelligence (AI), quantum technology and space-based capabilities will entirely alter India's defence landscape.[14] The transformation of the defence sector, from a legacy of colonialism to innovative and modern equipment highlights the country's commitment to preserve its territorial integrity and sovereignty. India is positioned to become a powerful force on the global stage while sustaining peace and stability in the region, as it continues to strengthen its defence capabilities through innovation, strategic partnerships and collaborative initiatives.

India's Defence Infrastructure Post Independence

Since Independence, India has had multiple defence manufacturing bodies, like the DRDO and Ordinance Factory Board (OFB), Defence Public Sector Undertakings (DPSUs) and private sector, to cater for the country's defence requirements and additionally encourage the indigenous manufacturing capabilities of the country. These organisations play a significant role in providing high-quality defence equipment, technologies and systems to Indian Armed Forces.

The DRDO is India's premier defence research and development agency, established in 1958 to handle security challenges, including the need to upgrade Indian armed forces with enhanced indigenous defence capabilities to tackle conflicts with neighbouring countries and reducing dependence on friendly foreign countries for imports.[15] Recognising the significance of indigenous defence capabilities, the Indian government initiated efforts to establish a dedicated agency for defence research and development. Since its inception, DRDO has made significant contributions to India's defence

capabilities, which comprise the development of strategic missile systems like the Agni series, Ballistic Missile Defencse systems, indigenous Light Combat Aircraft (LCA) such as Tejas, Main Battle Tanks (MBT) like Arjun, series of radar system known as Indian Doppler Radar (INDRA), sonar system like USHUS, Advanced Electronic Warfare (EW) Systems like Shakti, and more.[16]

In addition, India's DPSUs also play a significant role in India's defence manufacturing ecosystem. The origin of DPSUs may be traced back to the foundation of HAL in 1940. HAL played a key role in aircraft production and eventually grew into one of Asia's leading aerospace organisations. It produces a diverse variety of aircraft, helicopters and associated systems.[17] Substantially, several other DPSUs were established for other units within the defence sector, including naval vessels, armoured vehicles, missiles, electronics and many more. Notable DPSUs include Bharat Electronics Limited (BEL), Bharat Dynamics Limited (BDL), Mazagon Dock Shipbuilders Limited (MDL) and Garden Reach Shipbuilders & Engineers (GRSE).

Likewise, the defence industry sector was opened for private sector in the year 2001 through licensing, as the defence sector was initially reserved for the public sector.[18] There are some notable private sector companies in defence like Larsen & Toubro (L&T), Tata Group, Mahindra Group, Bharat Forge Limited, Reliance Group, Dynamatic Technologies Limited, Alpha Design Technologies Pvt Limited, Rolta India Limited, MKU Limited, etc.[19] In order to simplify the procedure and increase the participation of private sector, several measures have been taken by the government such as the Defence Procurement Procedure, BUY IDDM, Strategic Partnership Model, establishment of two defence industrial corridors, iDEX and so on.[20] These have resulted in a raise in the total turnover of private companies, which operate in the defence and aerospace sectors throughout the year. The total production was once close to Rs 15,000 crores in the year 2018–19, which was raised to Rs 16,411 crores or 22 per cent share in total defence production in year 2023–24. Till now, 442 licences have been issued so far. This list is not exhaustive, and there are several other private sector companies in India involved in defence manufacturing, technology development and services.

With all said though, there are several areas where these manufacturing bodies face difficulties. DRDO, for example, is overwhelmed by its bureaucratic red tapism that has slowed the decision-making process and thus affected project timelines. Many DRDO projects have experienced delays and cost overruns. Over and above these pressing issues, some army

personnel have raised concerns about the gap between DRDO's research and the practical needs of the armed forces. Likewise, many of the OFB factories that were functional before corporatisation in 2021, operated with outdated technology and infrastructure, which has impacted their efficiency and production capabilities. There have also been reports of defects and performance issues in the arms produced.[21] Thus, there is also an urgent need to address these weaknesses, which require a combination of strategic planning, improved management practices and enhanced collaboration with other stakeholders in the defence and technology sectors.

'Atmanirbhar Bharat Abhiyan' and the Defence Industry

In India's political landscape, the 2014 election is extremely significant as it was a turning point that transformed the nation's orientation and system of governance. It witnessed the unprecedented mandate that catapulted Narendra Modi and the Bharatiya Janata Party (BJP) to office. The clarion call for 'Atmanirbhar Bharat' or 'Self-Reliant India' was originally made on 12 May 2020, when Prime Minister announced the special economic and comprehensive package of Rs 20 lakh crores, equivalent to 10 per cent of India's GDP, to fight the COVID-19 pandemic in India.[22] Following the call of the Prime Minister, Minister for Finance and Corporate Affairs Nirmala Sitharaman laid down the details of the 'Atmanirbhar Bharat' package in a string of press conferences from 13 May to 17 May 2020.[23] Five pillars of the 'Atmanirbhar Bharat' were outlined, namely, 'economy', 'infrastructure', 'technology', 'vibrant demography' and 'demand'.[24]

Likewise, the 'Make in India' initiative was introduced by the Indian government in 2014 to transform the country into a global manufacturing hub.[25] More specifically in the defence sector, this effort seeks to expand manufacturing's proportion of India's GDP to 25 per cent and improve exports of defence items worth Rs 35,000 crores by 2025.[26] Further, from independence until the late 1990s, India's defence sector was mainly restricted to international investments. However, in 2001, the Indian government implemented the Defence Industry Policy, which authorised up to 26 per cent FDI in the defence sector via the automatic route, with higher levels of FDI being reviewed on a case-by-case basis. Similarly, in 2014, the FDI limit in the defence sector was raised to 49 per cent under the automatic route with approvals above 49 per cent requiring government inspection and approval. In addition, the Indian government altered its FDI policy for the defence sector in 2020, permitting up to 74 per cent FDI under

the automatic route, with government permission necessary for investments above 74 per cent.[27]

Another initiative such as 'Buy India (IDDM) Policy' is a flagship programme of the Government of India, introduced in 2016. IDDM stands for 'Indigenously Designed, Developed and Manufactured' and these are the three criterions for certifying as IDDM, such as, a defence product must be 'Indigenously Designed'.[28] This policy provides preference to defence products that are planned, developed and manufactured solely in India with the objective of boosting indigenous innovation, technological development and manufacturing capabilities. The IDDM strategy is carried out through several procurement procedures and instructions provided by the Ministry of Defence (MoD). When a defence purchase programme is launched, IDDM items are prioritised over other categories such as 'Buy and Make (Indian)', 'Buy and Make' and 'Buy (Global)'.[29]

To foster defence capabilities in manufacturing and to overcome the strategic hesitancy in defence exports, the Indian government even organises the Defence Exhibition, often known as 'DefExpo', every two years to draw attention to the country's capabilities in defence manufacturing and to promote the export of defence equipment. A wide range of defence sector participants, including foreign and local businesses, government organisations and academic institutions, can interact, collaborate and seek business opportunities at the event. A vast array of exhibits, including defence technology, systems, equipment and solutions from Indian and foreign businesses, was explored at DefExpo, 2022.[30] Furthermore, live demonstrations of defence systems and equipment are often presented at the event, giving participants a first-hand look at their capabilities. In addition, DefExpo frequently conducts conferences, seminars and panel discussions on topics relevant to the defence sector like technological advancements, international cooperation, procurement practices and defence policy.[31]

Enhancing International Engagement by Foreign Exports

India's defence growth is not limited to domestic achievements; it is also about establishing the country as a reliable defence partner on the global stage. The growing defence industry and the accompanying exports enable India to engage actively with various countries regarding defence collaboration.[32]

In recent years, India has successfully exported military equipment to several countries, signalling its capacity to meet international standards. This

engagement not only enhances the total revenue generated through exports, but also fosters strategic partnerships between India and other countries that can lead to enhanced security cooperation among them. Further, India supplies arms to over 85 countries, including Italy, the Maldives, Russia, Sri Lanka, the United Arab Emirates (UAE), the Philippines, Saudi Arabia, Poland, Egypt, Israel, Spain, Chile and others. India's defence shipments have seen a sharp rise in the recent years, increasing from Rs 686 crores in 2013–14 to Rs 21,083 crores in 2023–24.[33] Furthermore, Indian defence exports are not merely limited to aircraft. In a significant move, India entered into a Rs 6,000 crore defence deal to export its anti-air system to Armenia.[34] Further, Bharat Dynamics Limited (BDL) is poised to manufacture and deliver the Akash Surface-to-Air Missile (SAM) to Armenia, marking a pivotal step in India's strategy to bolster defence partnerships worldwide. India's defence relationship with Armenia has blossomed in the recent years, with a series of agreements that signify trust and mutual interest. Following the September 2022 deal involving the export of various weapons, including Pinaka multi-barrel rocket launchers, anti-tank missiles and ammunition, India has solidified its position as a reliable defence partner for Armenia. The shipment of the Advanced Towed Artillery Gun Systems (ATAGS) to Armenia last August further illustrates India's capacity to supply sophisticated military hardware. In addition, Kalyani Strategic Systems Limited has plans to procure 155mm artillery guns by 2025, which will enhance Armenia's defence capabilities and contribute to a long-term defence relationship between the two nations.

By providing arms to countries like Armenia, India aims to strengthen bilateral ties and position itself as a key player in the South Caucasus defence landscape. Further, the landscape for Indian defence exports is not limited to Armenia but extends to other regions as well.[35] Countries like Philippines and Vietnam have shown enthusiasm for acquiring BrahMos supersonic cruise missiles, a joint venture between India and Russia.[36] This interest is significant, as it demonstrates a willingness among Southeast Asian nations to invest in Indian military technology, often viewed as reliable and cost-effective compared to alternatives. Moreover, Indonesia's potential interest in acquiring BrahMos missiles further exemplifies the diversity of markets that India is targeting.[37] Such developments reflect a growing confidence amongst nations in India's indigenous technology and its military-industrial capabilities.

Table 1 Export of military equipment from India to foreign countries

Defence Export Components	**Countries**	**Manufactured by**
Bullet-Proof Jackets and Helmets	Australia, Azerbaijan, Bahrain, Brazil, Cambodia, Columbia, Czech Republic, Egypt, Ecuador, Germany, Iraq, Israel, South Korea, Lebanon, Mexico, The Netherlands, Myanmar, Norway, Oman, The Philippines, Poland, Qatar, Saudi Arabia, Serbia, Singapore, Somalia, Spain, Sri Lanka, Thailand, UAE, United Kingdom, Uruguay, USA	MKU Pvt Ltd; S.M. Carapace Armor; Indian Armour Systems Pvt Ltd
Armour Shielding	Germany, Mexico, Cambodia, Saudi Arabia	MKU PVT LTD, Mahindra Defense Systems, Indian Armour Systems Pvt Ltd
Ammunition (5.56mm - 155mm)	Kenya, Botswana, Turkey, Egypt, Indonesia, Thailand, Nepal, Bulgaria, UAE.	Ordnance Factory Board
Firearm Components	Argentina, Australia, Belgium, Burkina Faso, Cambodia, Canada, Czech Republic, Finland, France, Germany, Israel, Italy, Montenegro, Nepal, Philippines, South Africa, Spain, Switzerland, Thailand, Turkey, UAE, Ukraine, USA	Indom MIM Pvt. Ltd; Inmet Technology Solutions Pvt Ltd
Dornier (Do-228)	Mauritius and Seychelles	Hindustan Aeronautics Limited (HAL)
Flying Chetak	Namibia, Suriname, Nepal, Mauritius	Hindustan Aeronautics Limited (HAL)
Fast Interceptor Boats	Mauritius, Mozambique, Seychelles, Maldives	Garden Reach Shipbuilders and Engineers Limited; Larsen & Toubro Limited; Goa Shipyard Limited

Electronic Components	France, Singapore, Sri Lanka, United Kingdom, USA	Alpha-Elsec Defence and Aerospace Systems Pvt Ltd; Safran Electrical and Power India Pvt Ltd., Bharat Electronic Ltd; Goodrich Aerospace Services Pvt Ltd; Rosselltechssys
Batteries	Bangladesh, Croatia, France, Kuwait, Israel, Peru, Serbia, Singapore, Sri Lanka, UAE, Vietnam	HBL Power Systems Ltd; Titan Engineering and Automation Ltd; Neo Power Electronics and Projects Pvt Ltd
Offshore Patrol Vessels	Mauritius, Sri Lanka, Seychelles	Garden Reach Shipbuilders and Engineers Limited, Goa Shipyard Limited
Fast Attack Craft	Mauritius	Goa Shipyard Limited
Coastal Surveillance System	Mauritius, Seychelles	Bharat Electronics Limited
Interceptor Boat	Mozambique	Larsen & Toubro Limited
Sub Systems	Canada, Korea, Israel, Myanmar, Netherlands, Thailand, United Kingdom, USA	Larsen & Toubro Limited; Kalyani Rafael Advanced System Pvt Ltd; Micron Instruments Pvt Ltd; Godrej &BeyoceMfg Co Ltd; Mahindra Defence Systems Ltd; Alpha Design
Aero Components	France, The Netherlands, Sweden, United Kingdom, USA	Boeing India Pvt Ltd; Dassault Reliance Aerospace Ltd; GKN Aerospace Engine Systems India Pvt Ltd; TATA Advanced Systems Ltd; Goodrich Aerospace Services Pvt Ltd; Mahindra Aerospace Ltd; TATA Boeing Aerospace Ltd; Safran Electrical & Power India Pvt Ltd.
Light Weight Torpedo	Myanmar	Bharat Dynamics Limited (BDL)

Source: Ministry of Defence (2020).

The American factor in foreign exports

The Indo-US defence relationship has come a long way since the Cold War era, characterised by mutual suspicion and limited engagement. The turning point can be traced back to the 1990s with India being forced to liberalise its economy and strategic reassessment by the US in the post-Cold War era. Likewise, the signing of several key agreements over the years, like the civil-nuclear deal in 2005, the Logistics Exchange Memorandum of Agreement (LEMOA)[38] in 2016, the Communications Compatibility and Security Agreement (COMCASA)[39] in 2018, and Basic Exchange and Cooperation Agreement (BECA)[40] in 2020, laid the groundwork for robust bilateral defence collaboration. These agreements serve to facilitate military logistics and secure communications, essential for joint exercises and operations.[41]

Today, as geopolitical landscapes shift and defence technology becomes paramount, the importance of Indo-US bilateral relations has surged significantly. A notable step forward in this partnership is highlighted by the recent iCET (Initiative on Critical and Emerging Technologies), which focuses on defence manufacturing collaboration, particularly in the aerospace sector. Launched in 2022, the iCET initiative is a landmark endeavour aimed at advancing the strategic technology partnership and defence industrial cooperation between the US and India.[42] The inaugural meeting in Washington DC between US National Security Advisor Jake Sullivan and Indian counterpart Ajit Doval underscored the importance that both nations place on technological collaboration.[43]

A centerpiece of this agreement is the partnership between General Electric (GE), a leading US-based corporation, and HAL, one of India's premier aerospace companies. This collaboration focuses on the joint production of F-414 jet engines, which will power India's Tejas Mk2 fighter jets and the Advanced Medium Combat Aircraft (AMCA) Mk-1. Historically, the US has been cautious in sharing advanced military technology, even with its closest allies like the UK, France and Italy (PTI). The iCET initiative marks a notable shift in this policy, as the transfer of technology (ToT) is positioned at the forefront of the agreement. The estimated value of this deal is a staggering US$ 1 billion, with a substantial 80 per cent of the technology transfer included in the contract—a marked increase from the 58 per cent ToT stipulated in a previous agreement in 2010.

In August 2023, the US Congress proposed two bills: S.2096[44] and H.R.4312[45]. These legislative advancements aim to facilitate collaboration between US private companies and their Indian counterparts, allowing for defence equipment to be jointly manufactured outside US territory. This

legislative support underscores the commitment of federal government to enhancing its defence relationship with India, viewing it as a vital component of broader geopolitical strategies in Asia and beyond. However, many defence experts are still wary about the successful implementation of the ToT factor, as prior to iCET, DTTI was signed in 2012, which aimed at co-development and co-production. This was followed by INDUS-X and many other similar agreements. However, ToT remained primarily illusive. In all this though the constant efforts of the two countries to engage and intensify agreements is truly commendable.

Likewise, the strengthening of bilateral relations between India and the US has significant regional and global implications as both nations face shared challenges, like terrorism and the rising influence of China in the Indo-Pacific. Thus, cooperative efforts can serve as a counterbalance. Meanwhile, China's Belt and Road Initiative (BRI) extends its influence across Asia and beyond, raising concerns about debt dependencies and geopolitical leverage. The implications of these developments are deeply felt by both India and the US, compelling a re-evaluation of their strategic alignments. Joint military exercises, like 'YudhAbhyas'[46] and 'Malabar'[47], further strengthen interoperability and readiness among the armies of both countries, sending a strong message to the regional adversary, China. Additionally, strong Indo-US ties contribute to a rules-based international order and play a pivotal role in enhancing security architecture in the Indo-Pacific region. By engaging in multilateral forums and partnerships, like the Quadrilateral Security Dialogue (QUAD)[48], AUKUS[49] and I2U2[50], both nations aim to secure their geopolitical interests while promoting regional stability in the entire Indian Ocean Region.[51]

Hence, the integration of defence manufacturing and technology transfer between India and the US pushes to usher in an era of cooperation, one marked by shared interests and mutual benefits.

Challenges in Defence Exports

There are various internal and external obstacles that the defence sector has to deal with to safeguard its effectiveness, efficiency and modernisation. India has undoubtedly made significant strides in defence technologies. However, there are still gaps in areas like advanced fighter aircraft, missile systems and naval platforms.[52] Bridging these gaps requires substantial investment in research and development, but modernisation initiatives in the Indian defence sector have been hindered by persistent budgetary constraints. Even in the

midst of rising security threats, defence budgets are still not sufficient to keep up with operational demands and technological improvements.[53] This leads to inadequate military training, a backlog in maintenance and delays in the purchase of equipment. The financial support is frequently inadequate, which hinders significant endeavours aimed at developing capacity and infrastructure. The defence budget requires a significant increase to maintain technological innovation, strategic deterrence and preparedness in an increasingly complex security environment. Strategic planning and efficient resource usage are essential to properly manage these fiscal difficulties.[54]

Another challenge that India is facing is its dependency on imports.[55] The defence sector is deeply concerned about its reliance on imports for several reasons. Dependence on imports for essential defence equipment puts one at risk for supply chain interruptions, rising expenses and geopolitical unrest. Over and above, it has been experienced that the big powers deny the supply of critical technologies despite agreements. This further restricts the advancement of indigenous technology, hindering the ambition of self-reliance promoted by programmes such as 'Make in India'. Here, another major problem associated with the domestic indigenous industries is the non-adherence to delivery schedules by DRDO and other PSUs functional in India. This greatly compromises the security, sustainability and efficiency of the Indian armed forces that are always expected to be prepared to meet all exigencies in this anarchical global world order.[56] Additionally, 'Obsolete Equipment' is also a major concern that the Indian defence sector is facing. A significant portion of India's defence inventory consists of outdated equipment, which hampers operational readiness and effectiveness.[57]

Upgrading and modernising this inventory poses substantial challenges due to technological complexities and budgetary constraints. One can understand that lack of indigenous research and development is also an issue. While India has made strides in indigenous defence production, there is still a need for greater investment in research and development to develop cutting-edge technologies and reduce dependence on imports. Thus, securing technology transfers from foreign partners and protecting intellectual property rights are crucial for building a domestic defence industry that is capable of innovation and production.[58] On these lines, it becomes important to enhance collaborations between public sector defence firms (like DRDO and HAL) and private sector companies, which can help leverage strengths across the board.

Creating an ecosystem where both sectors can work together effectively is the key to indigenous modernisation of the defence sector. Building a

robust indigenous defence industrial base also requires sustained funding, collaboration between the public and private sectors and a conducive policy environment. Furthermore, with the increasing digitisation of defence systems, 'Cyber security' has also emerged as a significant concern.[59] India faces threats from state and non-state actors, targeting its military infrastructure, necessitating robust cyber security measures and continuous upgrading of defence networks. Moreover, India's defence stance is influenced by complex political and geopolitical dynamics, including regional security threats, alliances and most importantly, strategic partnerships. Managing these dynamics while safeguarding national interests requires diplomatic finesse and strategic planning.[60]

Addressing these challenges requires a multi-faceted approach involving policy reforms, increased investment in defence capabilities, streamlining procurement processes, fostering indigenous innovation and enhancing cooperation with international partners. Thus, considering these challenges, the present government of India has essentially begun to increase domestic defence production capacity, support research and development and strengthen partnerships for knowledge transfer and co-production agreements with both foreign and local organisations. However, despite all efforts, and considering the numerous challenges, it must be pointed out that much more effort and the adoption of right strategy needs to be approved as the way forward towards attaining self-reliance in the defence sector.

Strategy for Adopting 'Atmanirbharta' in Defence

It becomes important to note that attaining self-reliance in the defence sector in India is a multi-faceted endeavour that requires strategic planning and execution across several dimensions.[61] The key strategies to achieve this goal are mentioned below:

Strengthening R&D Capabilities

The first and foremost strategy for strengthening R&D capabilities is to increase funding and its optimal use. Allocation of more resources to defence R&D is required, which should include funding for both public sector research organisations like the DRDO and the private sector R&D initiatives. This is essential for promoting innovation and fostering an environment that encourages novelty by providing grants, incentives and support for cutting-edge research and new technologies. Further, collaborations and strengthened partnerships with universities and research institutions must

be promoted to ensure wider partnerships in research and technological advancements.

Developing Indigenous Industrial Base

The Government of India though has invested in developing an indigenous industrial base, much more can be done by way of encouraging more private sector participation in defence production. There is also the need to streamline procurement processes and create incentives for private firms, so as to enable them to invest in defence manufacturing. Additionally, the capabilities of the existing PSUs need to be upgraded and enhanced, in order to ensure they meet modern defence requirements keeping into consideration the quality and timelines.[62] This includes investing in new technologies and processes.

Streamlining Procurement and Production

Manufacturing, as such requires procurement of parts and raw materials, therefore it is important to reform the procurement processes. Here, one needs to work on simplifying and expediting the defence procurement processes to reduce delays and bureaucratic hurdles.[63] Implementation of transparent procedures helps in improving efficiency and trust, which is equally important for developing the new defence systems.

Building a Skilled Workforce

Before initiating any endeavour, the Government of India will have to invest in education and specialised training programmes, all in order to create a skilled workforce, which is an essential parameter for the success of the defence manufacturing houses. This also includes both technical training for engineers and management training for project leaders.[64] Additionally, efforts need to be made to retain and use the existing skilled workforce, and thus, discourage 'brain drain'.

Enhancing Policy and Regulatory Framework

The Government of India is well aware that policy support is a must for promoting self-reliance, such as tax incentives, subsidies for defence R&D and protectionist measures to encourage local production.[65] Additionally, regulatory reforms must be introduced that support innovation and reduces barriers to entry for new defence manufacturers. The Ministry of Defence, New Delhi, is quite proactive and understands its role as a linchpin in this regard.[66]

Thus, by addressing these areas comprehensively, India can make significant strides towards achieving self-reliance in its defence sector. The process however requires coordinated efforts from government bodies, defence organisations, industry leaders and academia to build a robust and self-sustaining defence ecosystem.

Conclusion

Considering India's growing self-reliance in the defence sector and the exponential growth of its arms exports, one may conclude that India is no longer a 'latent power', but definitely a benign power, which is aiming to become more and more self-sufficient in the defence manufacturing sector. This is evident from its rising arms exports and growing involvement in the war against terrorism and piracy. Consequently, India is currently accelerating the speed of development in all aspects of state affairs. With its export of defence equipments, India is also expanding its geopolitical reach to strategically important regions in the world, for instance, to ASEAN nations such as Vietnam, Philippines, Laos, Cambodia and others, which have territorial disputes with China in the South China Sea. India ensures its strategic advantage by helping and collaborating with these countries to counter China.[67] Another example is Armenia, located in Central Asia that provides a corridor to India to connect with Europe and Russia. Confining Azerbaijan by supporting Armenia is also strategically important because Azerbaijan with Turkey and Pakistan creates a kind of 'Triple Alliance' against India, as these three countries have a different stand on the Kashmir issue.[68]

Thus, considering its geopolitical location, security concerns, technical advances and financial constraints, creating an integrated strategy and self-reliance becomes crucial for India. Prioritising indigenous defence manufacturing through initiatives like 'Make in India' and 'Atmanirbharta' has propelled India to become not just self-reliant, but also a major producer of defence equipments in this tumultuous international order. By pursuing its grand strategy in a coordinated and sustained manner, India is successfully moving on the path of enhancing its self-reliance in the defence sector, reducing vulnerabilities and strengthening its national security capabilities while also challenging China's rise in the region.

Notes

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47. The Malabar Exercise is a naval exercise involving India, US, Japan and Australia, and is aimed at enhancing military cooperation and ensuring security in the Indo-Pacific region. Originally started in 1992 as a bilateral exercise between India and the US, it has expanded over the years to include other like-minded nations. The exercise focuses on joint naval manoeuvers, anti-submarine warfare, air defence, and maritime security operations. Malabar reflects the growing strategic partnerships among the participating nations, particularly in response to regional challenges, including China's increasing influence in the Indo-Pacific.
48. Comprising India, US, Japan and Australia, the QUAD is a strategic forum aimed at promoting a free, open and inclusive Indo-Pacific region. Initially established in 2007 and revitalised in 2017, this group serves as a platform for collaborative dialogue and multifaceted cooperation, addressing shared challenges and fostering regional stability.
49. AUKUS is a trilateral security pact between Australia, the United Kingdom, and the US, announced in 2021. Focused on the Indo-Pacific, it aims to counter China's growing influence by enhancing military cooperation, including sharing nuclear submarine technology, strengthening alliances and promoting regional security and stability.
50. I2U2 is a strategic partnership between India, Israel, the United Arab Emirates and the US, formed in 2021. Focused on addressing global challenges like food security,

clean energy and technology, it enhances collaboration in key sectors. Geopolitically, it strengthens ties between these regions, countering China's influence in West Asia.

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