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Strategic Considerations and India's Defence Manufacturing Sector

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Cover image: Test launch of Agni-V missile.

Designed by Mukesh Rawat

Strategic Considerations and India's Defence Manufacturing Sector

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Abbreviations

AMCA	Advanced Medium Combat Aircraft
AoN	Acceptance of Necessity
ATAGS	Advanced Towed Artillery Gun System
AVNL	Armoured Vehicles Nigam Limited
AWACS	Airborne Warning and Control System
AWEIL	Advanced Weapons and Equipment India Limited
BDL	Bharat Dynamics Limited
BE	Budget Estimates
BEL	Bharat Electronics Limited
BEML	Bharat Earth Movers Limited
BIS	Bureau of Industry and Security
BSF	Border Security Force
CAG	Comptroller and Auditor General of India
CAATSA	Countering America's Adversaries Through Sanctions Act
CAPF	Central Armed Police Forces
CBRN	Chemical, Biological, Radiological, Nuclear
CCS	Cabinet Committee on Security
CDS	Chief of Defence Staff
CGE	Central Government Expenditure
DAC	Defence Acquisition Council
DAP	Defence Acquisition Procedure
DCMA	Defence Contract Management Agency
DGA	Directorate General of Armaments
DGDPS	Directorate General of Defence Planning Staff
DJI	Da-Jiang Innovations
DPB	Defence Procurement Board
DPC	Defence Planning Committee
DPP	Defence Procurement Procedure
DPrB	Defence Production Board
DPSU	Defence Public Sector Undertakings
DRDO	Defence Research and Development Organisation
DSA	Defence Space Agency
EAR	Export Administration Regulations
EoI	Expression of Interest
EW	Electronic Warfare
FDI	Foreign Direct Investment
FMBT	Future Main Battle Tank

FPGA	Field Programmable Gate Array
FRCV	Future Ready Combat Vehicle
GCC	Gulf Cooperation Council
GDP	Gross Domestic Product
GIL	Gliders India Limited
GRSE	Garden Reach Shipbuilders and Engineers Limited
GSL	Goa Shipyard Limited
HAL	Hindustan Aeronautics Limited
HIL	Hardware-in-the-Loop
HSL	Hindustan Shipyard Limited
HSTDV	Hypersonic Technology Demonstrator Vehicle
IAF	Indian Air Force
IAI	Israel Aerospace Industries
ICBM	Intercontinental Ballistic Missile
IDDM	Indigenously Designed, Developed, and Manufactured
iDEX	Innovations for Defence Excellence
IGMDP	Integrated Guided Missile Development Programme
IIT	Indian Institute of Technology
IMF	International Monetary Fund
ISR	Intelligence, Surveillance, and Reconnaissance
ISRO	Indian Space Research Organisation
ITAR	International Traffic in Arms Regulations
ITBP	Indo-Tibetan Border Police
JV	Joint Venture
L&T	Larsen and Toubro
LCA	Light Combat Aircraft
MAD	Mutually Assured Destruction
MBRL	Multi-barrel Rocket Launcher
MBT	Main Battle Tank
MDL	Mazagon Dock Shipbuilders Ltd
MFDIS	Modernisation Fund for Defence and Internal Security
MoHA	Ministry of Home Affairs
MIL	Munitions India Limited
MoD	Ministry of Defence
MSME	Micro, Small, and Medium Enterprise
MTCR	Missile Technology Control Regime
NGMMCB	Next Generation Maritime Mobile Coastal Batteries
NSA	National Security Adviser

ODF	Ordnance Factory
OEM	Original Equipment Manufacturer
OFB	Ordnance Factory Board
OPV	Offshore Patrol Vessel
OROP	One Rank One Pension
PIB	Press Information Bureau
PSLV	Polar Satellite Launch Vehicle
PSO	Project Sanction Order
PSU	Public Sector Undertaking
QA	Quality Assurance
QR	Quantitative Requirement
QRSAM	Quick Reaction Surface to Air Missile
R&D	Research and Development
RE	Revised Estimates
RF	Radio Frequency
RFI	Request for Information
SAMS	Surface-to-Air Missile
SCOMET	Special Chemicals, Organisms, Materials, Equipment, and Technologies
SIL	Software-in-the-Loop
SIPRI	Stockholm International Peace Research Institute
SSB	Sashastra Seema Bal
SSBN	Ship Submersible Ballistic Nuclear
SSN	Submersible Ship Nuclear
STA	Strategic Trade Authorisation Tier 1
START	Strategic Arms Limitation Treaty
TIV	Trend Indicator Value
ToT	Transfer of Technology
UAV	Unmanned Aerial Vehicle
VSHORADS	Very Short-Range Air Defence System
YIL	Yantra India Limited

Executive Summary

A geographically smaller United Kingdom (UK) was able to gradually colonise a much larger area in the South-Asian sub-continent, including a country that is today called India. This was possible because of internecine jealousies, combined with high levels of alienation of the common people from their rapacious rulers, plus linguistic and regional divisions within India. A crucial factor was that the UK's military equipment was way more advanced compared to what the various Indian regional fiefdoms had in their arsenals.

On October 7, 2023, Hamas carried out a terrorist attack on Israeli civilians and military personnel and about 1,200 Israelis were killed, and about 250 were taken hostage. Subsequently, Israel has bombed Gaza repeatedly, due to which around 73,000 civilians have been killed, and most of Gaza has been reduced to rubble. The resultant human misery raises several questions about the use of guerrilla-type tactics by Hamas and the disproportionate use of military force by Israel. More recently, since February 28, 2026, the US and Israel have bombed Iran. Iran has retaliated by using drones and missiles against Israel and US military facilities in West Asia. Furthermore, Israel's armed forces have entered Lebanon to root out what the Israeli government has called Hezbollah and its affiliates. Abstracting from who was justified or the historical background of this ongoing, highly distressing human tragedy in West Asia, there are lessons that India needs to internalise regarding military preparedness and, equally importantly, domestic capabilities in defence production. It is abundantly evident that multilateral institutions such as the United Nations are incapable of mediating or restoring peace.

India's nuclear doctrine is based on retaliation to a nuclear strike against India. As of March 2026, a global reality is that nuclear weapons are unlikely to be used and definitely not against a country that possesses nuclear weapons. It follows that, in practice, military deterrence depends on a country's conventional weapons capabilities. Consequently, India needs to build and keep up to date its military weapons systems, for example, fighter aircraft, submarines, missiles, unmanned aerial vehicles (UAVs), including drones and so on.

In the 1950s, China received technical assistance from the Soviet Union. However, from around 1961, China's industrial development and production of defence equipment have been through indigenous effort. Starting at similar economic and technological levels in the 1950s, China is currently at much higher levels of sophistication, as compared to India, in manufacturing defence equipment.

Planning and Procurement in the Defence Sector

Decision-making in India's defence sector is highly centralised, with key procurement decisions made by the Cabinet Committee on Security (CCS). Over the years, several committees have been added to the planning and procurement processes. The structure of decision-making and periodic assessments has contributed to delays

in implementation. Moreover, the ambiguous nature of "quantitative requirements" (QRs) provided by the government to military equipment manufacturers serves as a shortcoming in the acquisition process. The lack of engineering capabilities is a hindrance in acquisition from foreign counterparts; moreover, the time taken to assess and implement the capabilities of both foreign and domestic suppliers is another shortcoming. It is also recognised that defence planning and spending should be incorporated into schedules longer than five years, since implementation takes longer. All these factors collectively make the defence procurement procedures highly time-consuming.

Expanding the Defence Sector Budget

Over time, defence expenditure as a percentage of gross domestic product (GDP) has declined gradually, even as border-related security challenges have increased. Further, this ratio is not an appropriate measure to assess the adequacy of defence expenditure. This is because the GDP could go up or down depending on the adequacy of rainfall or public health factors such as the COVID-19 pandemic. Therefore, defence expenditure as a percentage of the central government's revenues is a more appropriate yardstick for assessing and comparing the adequacy of such spending over time. A relatively large proportion of India's defence expenditure is spent on salaries and pensions (28% and 23%, respectively). This leaves limited availability of financial resources to promote technological advances through appropriate funding of research and development (R&D). Potential avenues for resource mobilisation include rationalising subsidies, particularly fertiliser and electricity subsidies, and renting out some of the available land pools that belong to the Ministry of Defence (MoD).

Limited Domestic Production Capabilities and Overreliance on Foreign Suppliers

In the Soviet Union, later Russia and in China, the entire range of defence equipment production has been and continues to be in almost entirely government-owned and managed establishments. By contrast, while priorities are set and funding is provided by the US government, defence equipment manufacturing is mostly done by the private sector in the US. Consequently, there is no conclusive argument to be made in favour of the public or private sector in the production of advanced defence equipment. Currently, India is at a point where much of its domestic defence-sector manufacturing comes from Defence Public Sector Undertakings (DPSUs). The Defence Research and Development Organisation's (DRDO) interaction with the three wings of the armed forces has been limited, which contributes to procedural delays.

Given India's territorial differences with Pakistan and China, defence strategists have speculated that India may face a simultaneous two-front armed confrontation with these two countries. The Government of India should consider the anticipatory actions needed, even though there is a low probability of India having to face armed

hostilities on two fronts, including the promotion of terrorism in India, particularly infiltration into Jammu and Kashmir by the Pakistani state or its proxies. India has successfully resisted external armed aggression except in the 1962 war with China. As of the end of 2025, India lags behind the US, Russia, and China in the indigenous production of sophisticated defence equipment. Consequently, India is overly dependent on imports of military equipment and related technology from Russian, Western, or Israeli sources. Given the strategic realities of the current and foreseeable world, it should be a priority for India to improve its defence production capabilities.

Unmanned Aerial Vehicles in Warfare

UAVs, or drones, are becoming an increasingly important technology in the defence sector. Although they are not perfect substitutes for fighter jets, they offer a cost-effective option and have been widely used in global conflicts such as those between the US/Israel–Iran and Russia–Ukraine. Their growing significance makes it imperative for India to develop this capability domestically, creating opportunities for both large and small firms to participate in their design, development, and assembly.

Private Sector Participation in the Defence Sector

The Make in India initiative seeks to reduce defence import dependence by promoting domestic manufacturing through measures such as the Strategic Partnership model, higher foreign direct investment (FDI) limits, corporatisation of the Ordnance Factory Board (OFB), indigenisation lists, prioritisation of "Buy Indian Indigenously Designed, Developed & Manufactured (IDDM)" and Innovations for Defence Excellence (iDEX), and reserving 75% of the modernisation budget for domestic procurement. However, private sector participation remains constrained by DPSU dominance, preferential treatment, and weak accountability despite demonstrated capabilities. Procurement inefficiencies, procedural delays, underutilised budgets, and a lack of coordination among stakeholders further hinder progress. Indian and foreign private sector defence equipment manufacturers have suggested avoiding preferential treatment for DPSUs, reforming the composition and functioning of the Defence Acquisition Council (DAC), establishing a dedicated procurement wing and a time-bound acquisition framework.

In overall terms, although India's capabilities in the defence manufacturing sector are increasing, these are substantially behind those of China. The consequent dependence on imports reduces India's national security and foreign policy options. To sum up, India's constraints in defence manufacturing are not merely financial. There are several policy shortcomings in the way decisions are made. Further, India's private sector does not face an even playing field when competing with public sector corporations and bodies such as the DRDO.

1. Introduction

India, as it has existed since August 15, 1947, has never had the same geographical borders with one central government located in Delhi. Colonial powers, namely the UK and, to a small extent, France, were able to overcome the resistance of the many local rulers spread over India since these had sharp differences or were even at war with each other. Additionally, the West in general, including the UK, was way more advanced in science and technology, including in military hardware.

Israel has used military power in Gaza, and about 73,000 civilians have been reportedly killed, with many times that number injured as of the end of February 2026. The use of missiles and firepower by Israel and the US against Iran, which started on February 28, 2026, has resulted in many Iranian civilian and military casualties. Russia is continuing with the war in Ukraine, with both sides using drones, and there have been significant numbers of casualties on both sides. Clearly, civilian populations are vulnerable to military decisions taken by foreign governments. Currently,[1] it appears that the US may not use force to annex Greenland. However, there are continuing threats to use force again against Venezuela or any other country that dares to oppose the current US administration's dictates. Even more than in the past, strategic and personality issues are clouding basic principles of national sovereignty, global economic priorities, and human welfare. There was relatively little international action, either bilaterally or via the United Nations, to even moderate the carnage in Iran and Lebanon. It appears from the counterattacks mounted by Iran that their drones were effective in damaging US bases in the Gulf countries and, to a minor extent, even locations in Israel. To an extent, it appears that India would be mostly on its own if faced with armed aggression from any quarter. Consequently, India needs to invest more financially and focus on developing its domestic defence armaments industry, including conventional weapons, drones, and missile shields.

In the context of armed aggression from foreign quarters, going back to December 14, 1962, the then acting Army Chief, General J. N. Chaudhuri, directed Lieutenant General T. B. Henderson and Brigadier Premindra Singh Bhagat to write a report on the October 20–November 21, 1962, war between India and China. According to media reports, the terms of reference for this Henderson–Bhagat report did not include decision-making at senior levels of the army or the political leadership. In 2014, Neville Maxwell, an Australian–British journalist, made extracts from Part 1 of this report public (Maxwell, 2001). Analysts have urged that the full Henderson–Bhagat report be placed in the public domain (Noorani, 2021). This would be useful both for information about what happened on the battlefront and for evaluating whether lessons from that war have been fully learned for indigenous defence manufacturing.[2]

[1] March 1, 2026 is the cut-off date for this paper with regards to events with strategic and defence manufacturing implications for India.

[2] Questions were posed in the Lok Sabha on December 16, 1970 and more recently on July 8, 2014 about the Henderson–Bhagat report. Further details are mentioned in an article on the editorial page of the *Indian Express* dated March 1, 2026, and titled, "55 years ago, When Parliament erupted over India–China book" by Shyamlal Yadav.

India has had wars, armed confrontations and intermittent hostilities with two of its immediate neighbours—China and Pakistan (Subramaniam, 2025). As of February 2026, India faces a hostile Pakistan to its west and a tricky and ambivalent northern border with China. Given these developments in the immediate neighbourhood, there is an urgency for India to strengthen its defence equipment manufacturing capabilities both to contain costs and to reduce uncertainties arising from dependence on foreign suppliers. Among the several factors that have reduced the government's financial headroom to invest adequately in indigenous defence production, and in education and health, are a lack of buoyancy in tax revenues, excessive subsidies for electricity and fertilisers, and the financial drain caused by the procurement and storage of far more food grain than required.

However, it is not the lack of funding for the defence sector alone that has caused shortcomings in the indigenous production of sophisticated defence equipment. India has not attracted, retained, or managed adequate numbers of technically gifted scientific and engineering personnel to innovate and produce sophisticated defence equipment in publicly owned undertakings or in the domestic private sector. Although this may be equally true in civilian sectors, the implications for India's national security and territorial integrity are far greater when it comes to a lack of adequately trained personnel in the defence manufacturing sector.

The paper's structure is as follows. Section 2 provides a short review of the Indian government's position on nuclear weapons and the fact that these cannot be used without inviting nuclear retribution. India's conventional military systems and preparedness should be widely perceived as adequate enough to deter external aggression. Section 3 includes information about India's conventional weapons, the number of armed forces, imports of weapons systems, and the progress of its domestic missile programme. Section 4 details the decision-making structures in the planning and procurement of weapons systems domestically and from foreign sources. Section 5 analyses India's budgetary constraints and comments briefly on what could be done to augment financial resources for the required defence sector funding.

Section 6 describes the production of conventional weapons systems in the domestic public and private sectors. Section 7 details India's dependence on foreign suppliers of defence equipment. Section 8 provides the landscape of India's position in developing UAV technology and its increasingly important nature in military conflict. Section 9 provides a summary of the feedback received by the authors of this paper from Indian and foreign private sector companies on the strengths and shortcomings of defence sector production in India. Section 10 concludes the paper.

An overarching and concluding thought in this paper is that while defence production in the US is mostly done by private sector companies, in Russia and China, it is domestic government-supported entities that are responsible for the research and production of highly sophisticated defence sector equipment.

2. Nuclear Weapons[3]

It may be argued by many that India's answer to an overwhelming military attack would be to threaten the use of nuclear weapons in retaliation. According to Kristensen et al. (2024), India's nuclear arsenal consists of around 150 fission and fusion devices. Given the sensitivity of such information, the Indian government does not provide the precise number of such weapons. India has opted for a "retaliatory" nuclear weapons policy, and this word was used in a Press Information Bureau (PIB) release (Prime Minister's Office, 2003) on the Indian government's position on nuclear weapons.

An extract from this PIB news item is as follows:

> *"The Nuclear Command Authority comprises a Political Council and an Executive Council. The Political Council is chaired by the Prime Minister. It is the sole body which can authorise the use of nuclear weapons.*
>
> *The Executive Council is chaired by the National Security Advisor. It provides inputs for decision-making by the Nuclear Command Authority and executes the directives given to it by the Political Council.*
>
> *The Cabinet Committee on Security (CCS) also reviewed and approved the arrangements for alternate chains of command for retaliatory nuclear strikes in all eventualities."*

It is evident from Wan (2026) and government statements around the world that all nations are well aware that any threat to use nuclear weapons would be counterproductive. The self-destructive result of using nuclear weapons was brought out hilariously in a 1964 Hollywood film called "Dr Strangelove: How I Learned to Stop Worrying and Love the Bomb."[4] *The Mint* newspaper, dated February 11, 2026, also carried an article titled "The return of Dr Strangelove: How MAD[5] Logic may be staging a grand comeback in nuclear strategy."[6] Despite the irrationality of any threat to use nuclear weapons, a race to raise stockpiles of such weapons in the US and Russia may start again, as the Strategic Arms Limitation Treaty (START)[7] between these two countries expired on February 4, 2026. According to media reports, Russia is prepared to stay within the limits of START, but it seems the current US government would like China to be part of any New START treaty as well (Isachenkov, 2026).

[3] Appendix 1 lists the stocks of India's nuclear weapons and those of other countries.
[4] It is a classic black comedy film directed by Stanley Kubrick. The film is a satire about the paranoia during the Cold War and consequent global nuclear annihilation.
[5] MAD—Mutually Assured Destruction.
[6] This article is authored by Sanjoy Chakravorty.
[7] The START Treaty between the US and Soviet Union (now Russia) was agreed to in 1991 and was intended to prevent a nuclear arms race.

3. Conventional Defence Equipment

The following tables are illustrative of defence equipment manufactured in India, either entirely in domestic facilities or in collaboration with foreign partners. This information is included to provide a sense of India's defence hardware and personnel.

Table 1 provides a list of defence equipment produced in India, or imported in semi-finished condition, for the three wings of the Indian armed forces during the years 2015–2023. As of early 2026, no facility in India fully produces engines for fighter jets or bombers.

Table 1: Defence Equipment Produced in India

Equipment	Description	Producer
Dhruv	Aircraft, helicopter	HAL
NGMMCB[8]	Coastal defence system artillery	BrahMos Aerospace Private Ltd[9]
Brahmos Naval	Missile	BrahMos Aerospace Private Ltd[10]
Swathi	Radar sensor	BEL
Do-228	Light transport aircraft	HAL (developed from Germany's General Atomics Aero-Tec Systems)
Pinaka 214mm	Multiple rocket launchers	Developed by DRDO, sub-systems and components developed by Tata Advanced Systems and L&T
Konkurs	Anti-tank missile	BDL
Akash SAMS and Akash-1	Missile	DRDO
Barracuda OPV	Patrol ship	GRSE
Falcon-2000	Transport aircraft	Dassault Aviation (French entity), in partnership with Reliance Group

Source: Stockholm International Peace Research Institute (n.d.); individual company profiles.

Note: The above information is not exhaustive.

NGMMCB = Next Generation Maritime Mobile Coastal Batteries; DRDO = Defence Research and Development Organisation; L&T = Larsen and Toubro; SAMS = Surface-to-air missile; OPV = Offshore Patrol Vessel; GRSE = Garden Reach Shipbuilders and Engineers Ltd; BDL = Bharat Dynamics Ltd; BEL = Bharat Electronics Ltd; HAL = Hindustan Aeronautics Ltd.

Table 2 lists some of the missiles produced in India in collaboration with a Russian manufacturer or indigenously designed by the DRDO.

[8] Next Generation Maritime Mobile Coastal Battery (Long Range).
[9] BrahMos Aerospace Private Ltd is a JV between India and Russia.
[10] This is a private unlisted company incorporated in December 1995.

Table 2: India's Missiles

Missiles	Range (km)	Producer
BrahMos	300–500	BrahMos Aerospace Private Ltd (JV between India and Russia)[11]
Agni-V	2000–2500	DRDO
Nirbhay	800–1000	DRDO
HSTDV	1500	DRDO
Pralay	150–500	DRDO, BDL

Source: Business Standard Blueprint (2025d); individual company profiles.

Note: Content may not be exhaustive. DRDO = Defence Research and Development Organisation; HSTDV = Hypersonic Technology Demonstrator Vehicle; BDL = Bharat Dynamics Ltd; JV = Joint Venture.

Table 3 shows that the US follows Russia and France as the third-ranked country in terms of the value of India's defence equipment imports.

Table 3: India's Top Arms Suppliers (2021–2025) (Percentage)[12, 13]

Country	Share of India's Total Imports
Russia	40
France	29
Israel	15
US	13

Source: Stockholm International Peace Research Institute (n.d.).

Table 4 indicates that India is an important destination for the arms exports of Israel, Russia, and France. Clearly, there are strategic policy implications for India with respect to Russia, France, the US, and Israel.

Table 4: India's Share in Total Exports of Select Countries (Percentage)

Country	Share of Exporters' Total Exports
Israel	37
Russia	34
France	29
South Korea	15
South Africa	13
Ukraine	11

Source: Stockholm International Peace Research Institute (n.d.).

[11] It is a private unlisted company.

[12] The absolute value of these numbers is not available from a single credible and comparable source. Stockholm International Peace Research Institute (SIPRI) measures absolute numbers in trend value indicator (TIV) to calculate the extent of imports cross-country and inter-temporally in a comparable manner.

[13] TIV is a metric developed by the SIPRI to measure the volumes of transfers of major conventional weapons. TIV does not represent the financial value. Instead, it is a standardised indicator based on the estimated cost of production of weapon systems intended to enable consistent comparison across countries and over time.

Given the rapid rise in the sophistication of conventional weapons and automated guidance systems, including drones, governments around the world may choose to freeze or even reduce the number of standing army, air force, and navy personnel. Despite any future reduction in standing armed forces, it is instructive to compare the current numbers of such personnel in India, China, and Pakistan.

Table 5 lists the strengths of the three wings of India's armed forces and those of its two neighbours to the east and west. China has the largest number of such personnel in India's neighbourhood. Incidentally, according to conventional wisdom in military circles, an attacking land army needs to be at least three times the size of the defending troops to overwhelm the latter in conventional battle. In the final analysis, the number of trained defence personnel becomes relevant in any armed confrontation, irrespective of the quality or quantity of defence equipment. This has become abundantly obvious in the bombing[14] of Iran by the US. It appears that the US is hesitant to use ground troops in large numbers, given that Iran is said to have an army of about 1 million, including reserves.

Table 5: Indian Military Personnel Compared to Its Neighbours

	Army	Navy	Air Force
India	21,48,000	1,48,869	2,89,000
China	25,45,000	3,84,000	4,03,000
Pakistan	13,11,500	57,500	78,000

Source: Global Fire Power Estimate (n.d.).

Table 6 provides the timeline over which India has increased the reach of its missiles. Except for the BrahMos missile, produced in collaboration with Russia, the other missiles were developed indigenously in India.

Table 6: India's Missile Progression

Year	Name	Range (km)	Additional information
1980s	Prithvi I	150	
	Nag	0.5–4	
1990s	Akash	25	
	Agni-1	700–1200	
	Agni-II	2000–3500	Extended India's medium-range strike capability
	Prithvi II	350	
2000s	BrahMos	300–500	World's fastest operational cruise missile
	Agni-III	3000–3500	Major boost in nuclear deterrence

[14] As of March end to early April, 2026.

Year	Name	Range (km)	Additional information
2010s	Astra Mik-1	110	
	Agni-IV	4000	
	QRSAM	25–30	Mobile air defence for fast deployment
	Agni-V	2000–2500	India's first ICBM-class
2020s	Amogha-III	0.2–2.5	
	Astra Mk-II	160–200	Long-range air-to-air in trial
	HSTDV	1500	Indigenously developed (in test)
	Pralay	150–500	Designed for precision

Source: Business Standard Blueprint (2025d).

Note: QRSAM = Quick Reaction Surface to Air Missile; HSTDV = Hypersonic Technology Demonstrator Vehicle; ICBM = Intercontinental Ballistic Missile.

4. Planning and Procurement

Currently, all significant defence manufacturing and procurement decisions are taken at the apex level by the Indian CCS, which is headed by the Prime Minister.[15] Separately, based on a Group of Ministers' report, a Defence Acquisition Council (DAC) headed by the Defence Minister was set up in 2001.[16] The members include the chief of defence staff (CDS),[17] the Army, Air Force, and Navy service chiefs, the Defence Secretary, Secretary of the Defence Production, and other officers from the MoD. In April 2018, a Defence Planning Committee (DPC) was set up, which is headed by the national security adviser (NSA).[18] This DPC's members include the CDS, the three service chiefs, the Defence Secretary, the Foreign Secretary, and the Secretary of Expenditure in the Ministry of Finance.

It is noteworthy that planning for defence expenditure was not part of the First Five-Year Plan. Such planning started in 1964 after the debacle in the 1962 war against China. Since then, there were five-year defence plans, in fits and starts, until about 2015. In the 9th Plan, from 1997 to 2002, against an approved budgetary allocation of INR 2,431 billion, actual expenditure was INR 2,261 billion. The 10th Plan, from 2002 to 2007, had an approved amount of INR 3,792 billion, against which INR 3,576 billion was spent. These unspent amounts were relatively small, yet they reflect the cumbersome procedures that are followed before allocated funds can be spent by the MoD. As of 2018–2019, prior to the COVID-19 pandemic, according to Behera (2020b), the Indian Army accounted for about 67% of the underspending, perhaps because the Army's procurement processes are more decentralised than those of the Air Force and the Navy.

[15] The other members of the CCS include the defence minister, home minister, and finance minister.
[16] The DAC was set up pursuant to the recommendations of a group of ministers' report on Reforming the National Security System post the 1999 Kargil War.
[17] The CDS is also a secretary in the Department of Military Affairs in the MoD.
[18] The NSA has replaced the cabinet secretary as the chairman of the Strategic Policy Group (SPG).

The DAC and DPC are responsible for periodic assessments of India's defence requirements and keep an eye on the implementation of government-approved defence expenditure. On a related note, the Directorate General of Defence Planning Staff (DGDPS) was set up in 1986. Six Director Generals of the DGDPS were changed in the 1980s. More recently, there were protracted differences of opinion between the MoD and the Ministry of Finance about the amounts and subject heads of defence expenditure. This periodic formation and sidelining of groupings to examine external threat perceptions and the resulting recommendations is reminiscent of Franz Kafka's unfinished novel, called *The Castle*, in which he writes about a frustrating pursuit of unattainable objectives in the face of bureaucratic processes.

A significant shortcoming in acquisitions from Indian public sector companies or foreign firms engaged in the production of defence equipment is the inadequate rigour of the technical evaluation of bids. This is probably a result of the ambiguous nature of the so-called "QRs", which are provided by the Indian government to prospective providers of military equipment. QRs are technical and operational specifications defined by India's Armed Forces for the purchase of military equipment. Under the Defence Acquisition Procedures (DAP) 2020, QRs define the performance attributes and quality standards necessary to meet specific operational needs and combat threats. By contrast, the US government, as well as France and the UK, require prior certification from defence acquisition universities when making large defence acquisitions, as explained in detail in the 2016 book by Behera, *Indian Defence Industry: An Agenda for Making in India*. Indian defence procurement from domestic or foreign sources has been characterised by delays, which have at times stretched over decades. The following is an illustrative extract from a report of the Parliamentary Standing Committee on Defence for 2022–2023:

> *"During the course of evidence, an issue was raised by the Committee regarding the delay in mission mode projects of the Defence Research & Development Organisation (DRDO). The Committee learnt from the Comptroller and Accountant General's (CAG) report, tabled in the Parliament on 21 December 2022, that 178 projects were examined. Of these 178 projects, the original time tables were not adhered to in 119 cases. For 49 projects, the additional time taken was more than the original time allotted and overall delays ranged between 16 per cent and 500 per cent beyond the agreed deadlines. This report also said that there were cost overruns and projects were closed, declaring them successful despite non-achievement of one or more key objectives and parameters."*

The following is a limited, patchy yet illustrative overview of the acquisition of military equipment from foreign suppliers over the last 50 years. The USSR supplied T-72 tanks; Bofors field guns were acquired from Sweden; Mirage 2000 aircraft came from France; and MiG-23, MiG-26, MiG-27, and MiG-29, along with Il-76 fighter and transport aircraft, came from the USSR (Russia).[19] By the end of the 1980s, the Indian Navy's defence expenditure had sharply increased compared to the late

[19] Appendix 8 provides details on Indian imports of key Russian missiles.

1970s.[20] The MiG-29 and Sukhoi SU-30 fighter jets were acquired from Russia, while Mirage aircraft were bought from France; they were acquired mostly on a deferred payment basis. C-130 I Super Hercules and C-17 Globemaster III transport aircraft, HAWK, Apache, and Chinook helicopters, as well as Pilatus trainer aircraft, were acquired from the US on deferred payment terms.

MiG-29 from Russia and Jaguar aircraft from the UK have been upgraded, but they remain behind recent versions of comparable aircraft around the world. In terms of equipment, as of mid-2025, the Indian Air Force (IAF) was the worst off among the three arms of India's defence forces. Currently, the IAF has 26 squadrons, and although the sanctioned strength is 42 squadrons, according to expert opinion, India may be able to manage with about 35 squadrons (Peri, 2020; The Economic Times, 2025a). Consequently, the acquisition of 36 Rafale fighter aircraft[21] was relatively low in number. By the end of 2025, India should have produced its own fighters with adequate firepower and targeting sophistication. Alternatively, India should have contracted for a larger number of such aircraft from foreign suppliers. However, with the benefit of hindsight about the effectiveness of armed drones, as proven by the efficacy of their use in the ongoing Russia–Ukraine war and the US–Israel attacks on Iran, it was perhaps wise for India not to purchase higher numbers of expensive Rafale fighters at one go.

Transfer of technology (ToT) from foreign suppliers of military equipment is a basic premise of India's so-called "offset" policy. This system, which was set up to decide on production partners and to manage corresponding relationships in terms of accountability for timely delivery, has been plagued with inefficiencies. ToT cannot work efficiently if Indian counterparts are not sufficiently knowledgeable in a hands-on engineering sense, as distinct from theoretical knowledge of the underlying pure sciences. By now, it should have been possible for selected Indian scientific and engineering personnel to at least reverse-engineer some imported defence equipment. For example, by the end of 2025, India should have been able to manufacture sophisticated, long-range unmanned combat aerial vehicles. The unfortunate reality is that India has yet to put together a manned fighter aircraft fully indigenously.

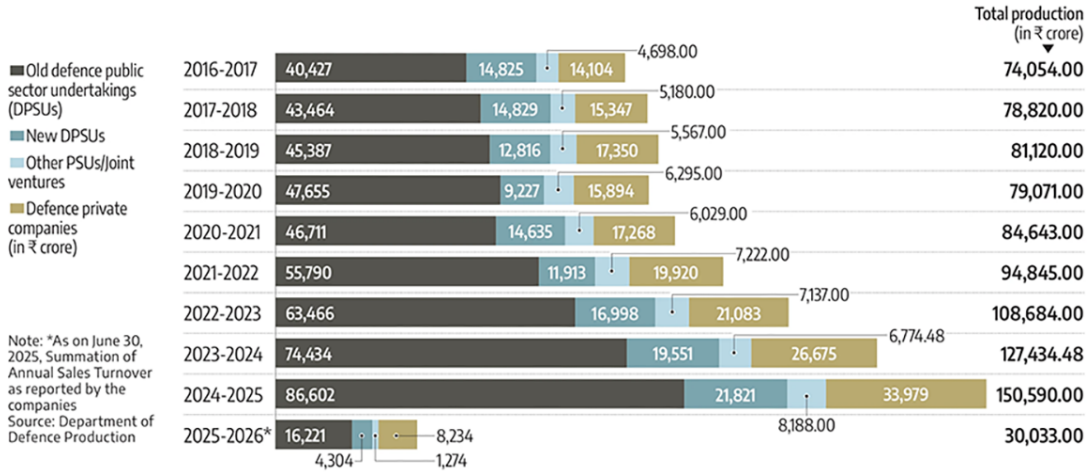
Government of India's offset policy, which came into effect on August 1, 2012, is detailed in a 31-page document issued by the Acquisition Wing Secretariat (MoD, 2012). According to this policy, foreign suppliers of defence equipment have to invest a mutually agreed percentage, usually 30%, of the import value in Indian defence R&D, manufacturing, and technology transfer. In 2020, the Government of India was reported to have diluted this practice of offsets (Peri, 2020). India needs to shorten the time taken to assess defence requirements and implement manufacturing and acquisition decisions, whether from domestic or foreign suppliers. Despite various

[20] According to a professional in an Indian private sector company engaged in defence equipment production, the Navy is advanced in the use of sophisticated technology as compared to the Army and Air Force.

[21] About 16–18 aircrafts make up one squadron.

shortcomings, as Figure 1 shows, the value of Indian defence production has increased considerably over the last 10 years.

Figure 1: Indian Defence Production Doubles in Nine Years (INR crore)



Source: Business Standard Blueprint (2026).

Note: DPSU = defence public sector undertaking; PSU = public sector undertaking.

The Government of India has long recognised that defence planning and spending should be incorporated into schedules longer than five years, since implementation takes a long time from planning to actual production. Accordingly, a consolidated back-dated plan was approved by the DAC in June 2006 for the period 2002–2017. A revised version was approved in April 2012 for the 15 years from 2012 to 2027. It is apparent from the membership of India's defence planning bodies that all stakeholders are well represented in the government's decision-making processes. In practice, however, overlaps in jurisdiction lead to multiple queries that delay spending and implementation schedules. All things considered, the Indian government's Defence Procurement Procedures (DPPs) are cumbersome and time-consuming.

To sum up, the relentless and rapid advances in the early warning, targeting, and effective firepower of weapons systems, and the consequent obsolescence of highly expensive military equipment, pose a continuing dilemma for Indian arms production and acquisitions. It is apparent from comments made by officials and non-partisan strategic experts that (a) there are doubts about whether the Indian defence sector is receiving adequate funding; (b) there have been lengthy delays in production schedules; and (c) India is not yet in a position to produce sufficiently advanced weapons systems within the country.

These three intertwined issues run through the contents of this paper.

5. Budgetary Constraints[22]

At India's current stage of progress, there are funding shortfalls for a host of required expenditures to improve average human development indicators in the country. The Indian Constitution makes the central government exclusively responsible for all matters related to the country's hard currency borrowings, foreign policy, and defence, including all related expenditure. It follows that the central government has to balance the financial requirements of military preparedness with those of the well-being of the Indian people.

In the 1950s, defence expenditure as a percentage of GDP was about 1.6 to 1.8%. Immediately after the 1962 debacle against China, this number went up to 3.6%. More than two decades later, around the mid-1980s, and following the Central Fourth Pay Commission's recommendations, defence expenditure on salaries grew annually at double-digit rates until the balance-of-payments crisis years of 1990–1992. After the devaluation of the Indian rupee in 1991, expenditure on defence did not keep pace with inflation until the late 1990s.

Anomalously, prior to financial year (FY) 1986–1987, expenditure on the maintenance of fighter aircraft, aero-engines, and heavy and medium-sized vehicles was included in revenue expenditure. This was corrected in 1987–1988, and capital expenditure went up from 13% to 32% of total defence sector spending. Expenditure on ordnance factories (ODFs) was also moved from the revenue head to the capital head around 2004–2005. Consequently, it is only from around FY 2005–2006 that the MoD's capital expenditure could be contrasted with its revenue expenditure in any meaningful manner. In the last 10 years, defence expenditure as a fraction of GDP has drifted down to around 2%, or even a little less in certain years.

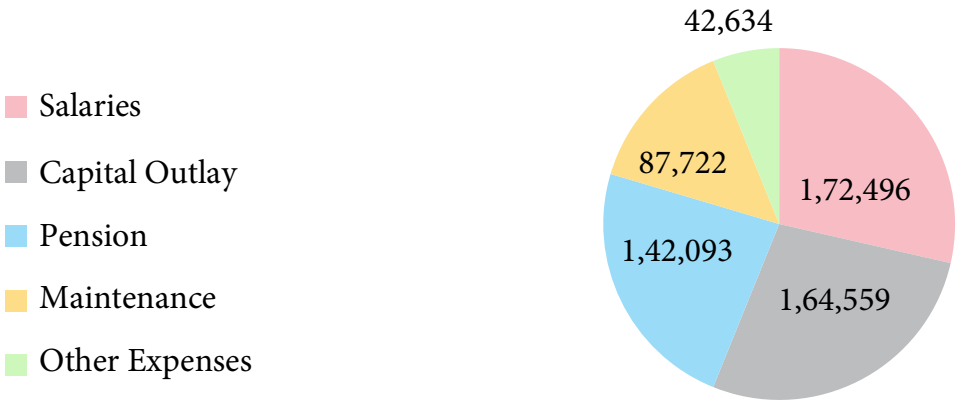
5.1 Ministry of Defence Budget Allocations and Expenditure[23]

It is worth noting that in the past, the MoD was often unable to spend allocated amounts within specified time periods. For example, during the Seventh Plan from 1985 to 1990, an amount of INR 719.4 billion was allocated, but expenditure was INR 581.9 billion. The Eighth Plan from 1990 to 1995 was abandoned. Those were the years of the foreign-exchange shortage crisis of the early 1990s, and India needed to accept an International Monetary Fund (IMF) package. More recently, in the 10 years between 2010 and 2019, the Indian Army alone accounted for two-thirds of the underspending (Behera, 2020b). The Army has more personnel than the Air Force and the Navy combined. Consequently, it is likely that the Army's expenditure processes involve a larger number of approvals at various levels. The proportion of the MoD's expenditure on salaries and pensions has grown steadily over the years.

[22] Appendix 2 provides India's defence budget details.
[23] MoD budget details are provided in Appendix 2.

In 2023–2024, as Figure 2 showcases, salaries covered about 28% of the total defence expenditure, followed by capital outlay at 27%, pensions at 23%, and maintenance and other expenditures at 14% and 6%, respectively.

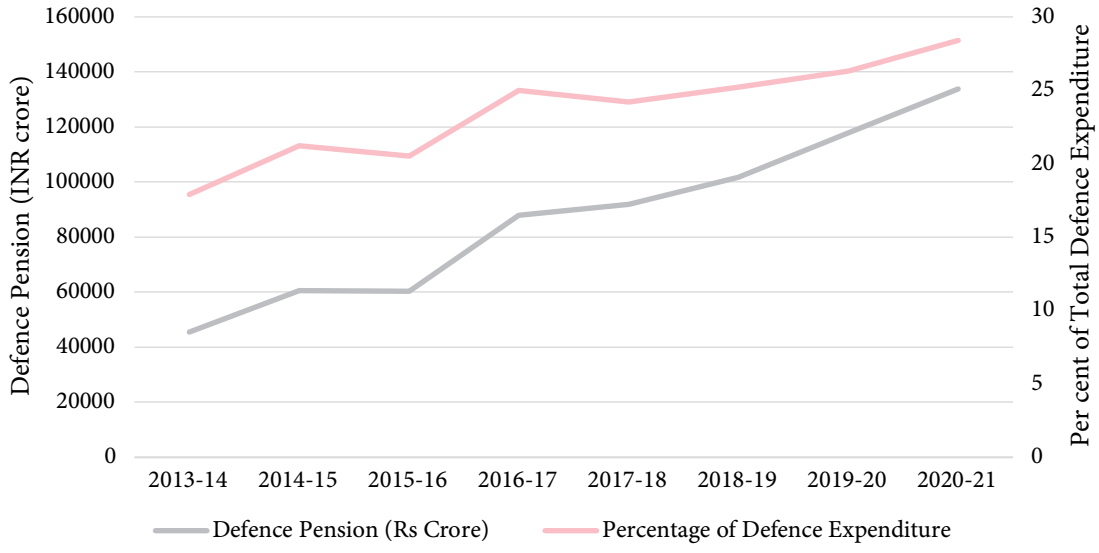
Figure 2: Share of Major Heads of Defence Expenditure, 2023–2024 (INR crore)



Source: Ministry of Finance (n.d.).

Specifically, the MoD's expenditure on salaries was about 30% of total defence expenditure in 2019–2020. The figure for pensions as a percentage of total defence expenditure rose sharply from about 19% in 2013–2014 to around 28% in 2020–2021. Figure 3 shows that expenditure on defence pensions has been increasing both in absolute terms and as a fraction of total defence expenditure.

Figure 3: Ministry of Defence's Expenditure on Pensions Over the Years



Source: Finance Commission India (n.d.).

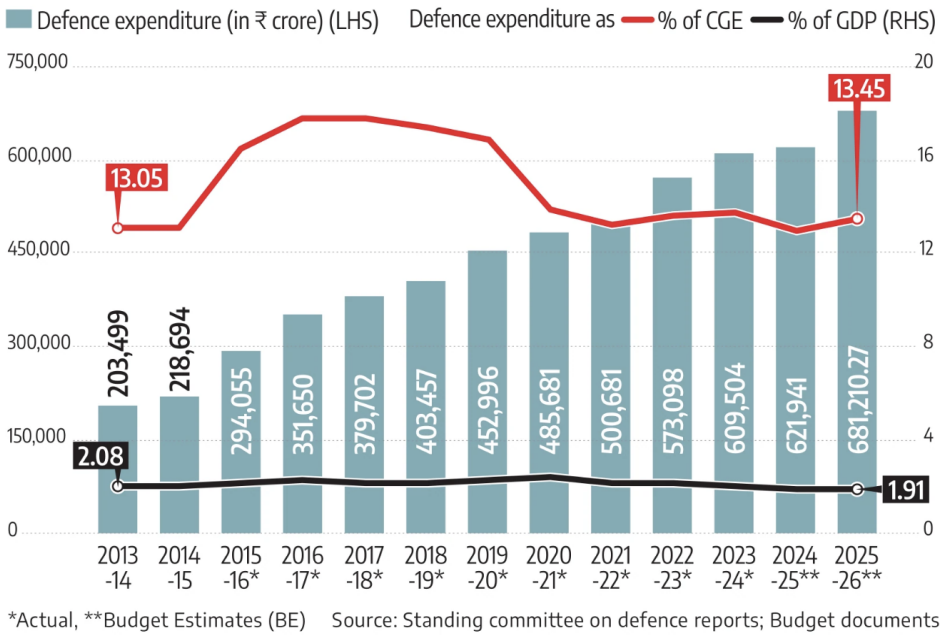
Over the past 37 years, India's defence budget has decreased from about 3.3% of the GDP in 1987–1988 to 1.9% in 2024–2025. As salaries and pensions have to be paid, expenditure on R&D and on hardware for the three wings of the armed forces has necessarily decreased as a fraction of GDP.

All things considered, the ratio of defence expenditure to GDP is not an accurate measure for assessing the adequacy of the Indian government's expenditure on defence. Indian GDP could increase sharply or fall substantially short of projected numbers for a variety of reasons, for instance, a sustained fall in the price of imported oil, inadequate and untimely rainfall, or a pandemic such as the one caused by the COVID-19 virus. By contrast, India's threat perceptions are not volatile. Consequently, the ratio of national defence expenditure to the central government's revenues is a better metric for judging whether defence expenditure is affordable, given the government's financial resources.[24]

Figure 4 shows defence expenditure as a share of GDP and central government expenditure (CGE), which is a commonly used metric for tracking overall defence expenditure.

In the central government's budget presented in Parliament on February 1, 2026, projected defence expenditure for the fiscal year 2026–2027 as a percentage of CGE has gone up to 14.7%.

Figure 4: Defence Expenditure Share in Gross Domestic Product and Central Government Expenditure



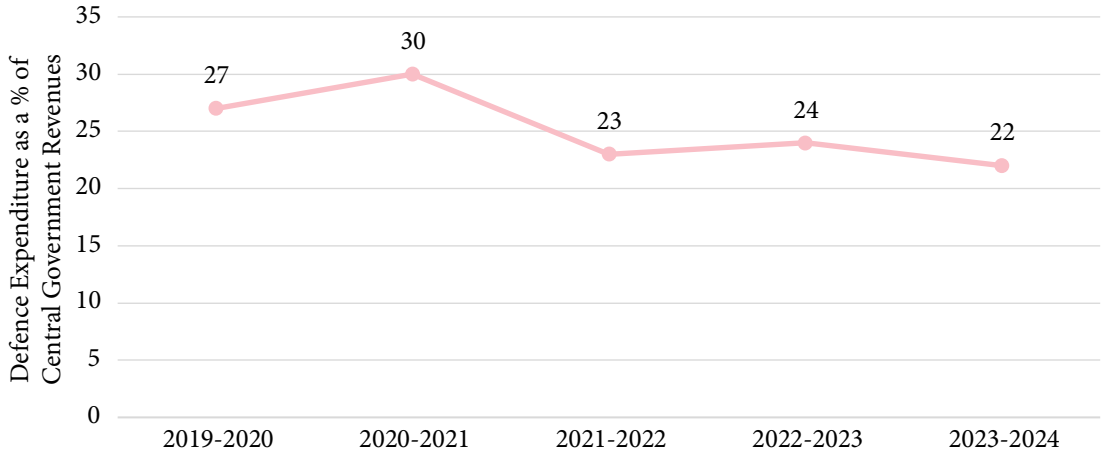
Source: Business Standard Blueprint (2026).

Note: CGE = central government expenditure; BE = budget estimate.

Figure 5 provides India's defence expenditure as a fraction of central government revenues from 2019–2020 to 2023–2024. It can be seen that defence expenditure was somewhat more or less than one-fourth of the central government's total revenues. This number decreased from 27% of revenues to 22% between 2019–2020 and 2023–2024.

[24] Refer to Appendix 2 for the layout of defence expenditure, capital outlay, and pensions.

Figure 5: Defence Expenditure as a Percentage of Central Government Revenues



Source: Ministry of Finance (n.d.); authors' calculations.

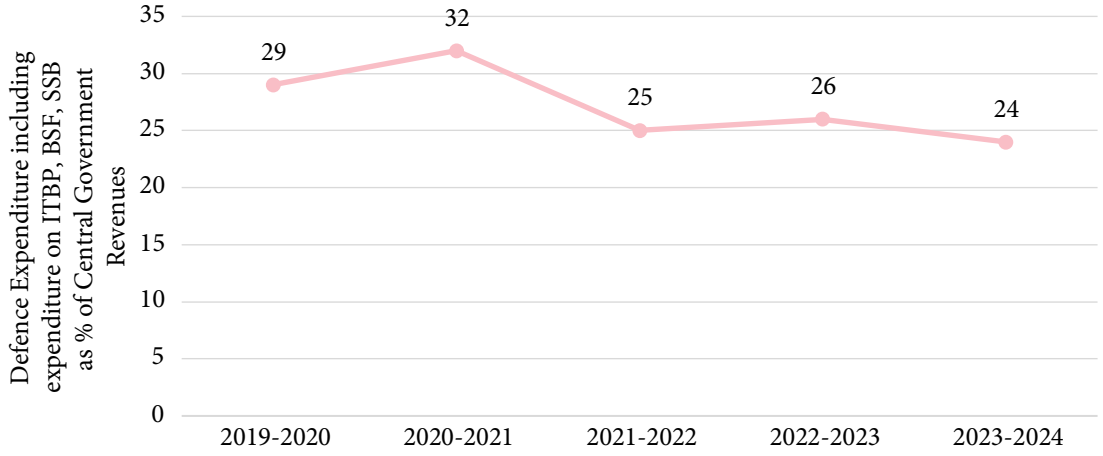
Note: Defence expenditure includes civil expenditure, capital outlays, and pensions.

By the end of 2025, the amount spent annually on border security-related personnel—including the Indo-Tibetan Border Police (ITBP), Border Security Force (BSF), Sashastra Seema Bal (SSB), and Assam Rifles—was included in the budget of the Ministry of Home Affairs (MoHA). It would improve analytical clarity to include expenditure on these border protection forces, which perform functions similar to those of India's armed forces, in the defence budget. Figure 6 presents the expenditure of the MoD, along with spending on India's border security forces, as a percentage of the central government's total revenues, including cesses that accrue to the central government and are not shared with state governments.[25] The BSF, ITBP, Assam Rifles, and SSB have been allocated INR 66,340 crore in the 2026–2027 Union Budget.

It can be seen that, in each of the financial years from 2019 to 2024, expenditure on defence, including the border protection forces, is about 2% higher than it would be if expenditure on these border security personnel were not included. Defence expenditure, including border security forces, has declined from a peak of 32% in 2020–2021 to 24% in 2023–2024.

[25] Appendix 3 showcases the Ministry of Home Affairs' budget allocations for ITBP, BSF, and SSB.

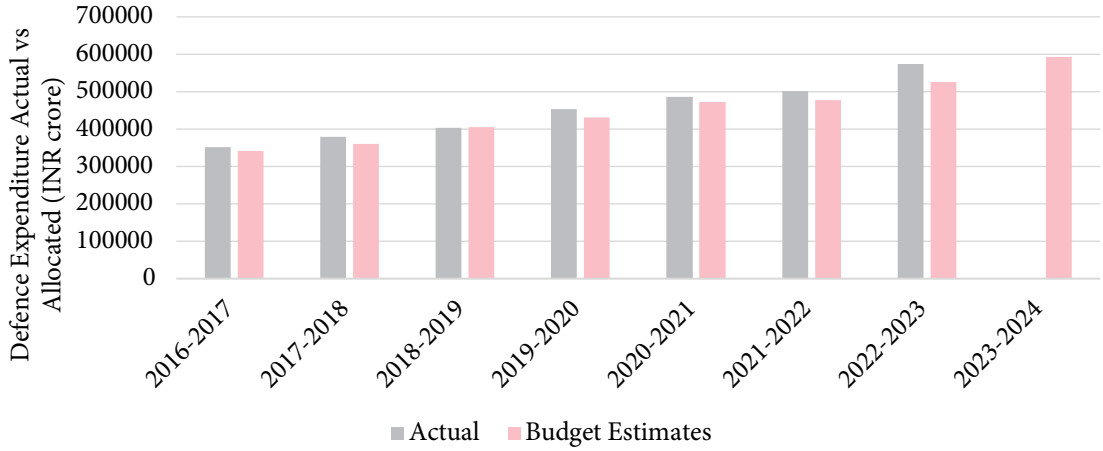
Figure 6: Defence Expenditure Including Indo-Tibetan Border Police, Border Security Force, and Sashastra Seema Bal as a Percentage of Central Government Revenues



Source: Ministry of Finance (n.d.); authors' calculations.

Figure 7 presents defence expenditure approved annually and the amounts actually spent between 2016–2017 and 2023–2024. In each of these years, the allocated funds were spent within the corresponding fiscal year.

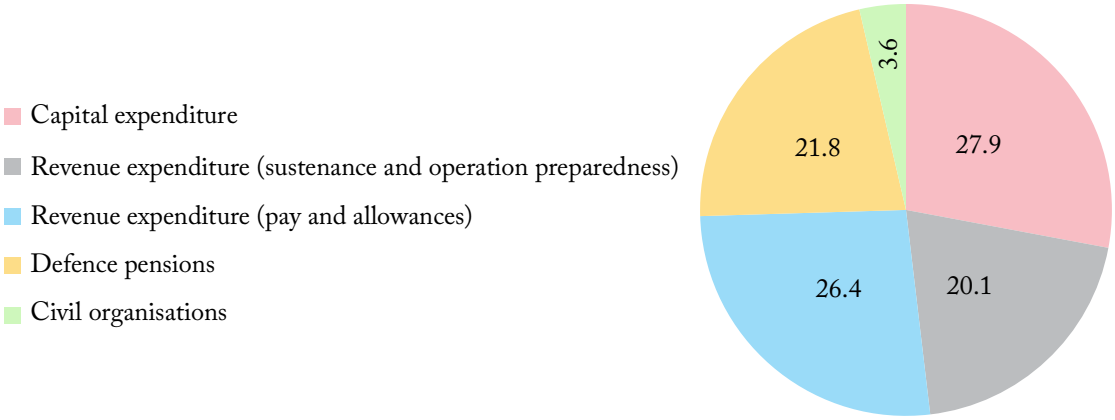
Figure 7: Defence Expenditure: Actual Versus Allocated (INR crore)



Source: Ministry of Finance (n.d.).

The 2026–2027 budget, announced on February 1, 2026, showcased some significant changes in the defence budget. The allocation was raised to INR 7.85 lakh crore, which is estimated at 2% of the GDP, an increase from the previous year's 1.9% and a 16% rise in rupee terms from the previous year's budget allocation. More importantly, the budget for capital expenditure has been increased substantially from INR 1.8 lakh crore to INR 2.19 lakh crore. The share of capital expenditure is 28% of the budget, followed by 26% for salaries and pensions, at 22%.

Figure 8: Defence Budget Allocation for 2026–2027 (Percentage)



Source: Press Information Bureau (2026).

Effectively, over fiscal year 2026–2027, it is anticipated that approximately 68.3% of the MoD's expenditure would go towards pay and allowances, pensions, and administrative costs, and the remaining 21.7% would be spent on weapons systems.

5.2 Raising of Additional Resources for Military Expenditure

To raise resources for defence spending, the Indian government could reduce current expenditures on non-merit subsidies. For example, over the years, the central government's fertiliser subsidies have amounted, on average, to about 0.7% of GDP per annum. In 2008–2009, India spent nearly 60% of the total allocation for subsidies on fertilisers, amounting to INR 99,495 crores, which was more than 4.5 times the total public investment in agriculture. For FY 2025–2026, the Indian government has provided around INR 1.62 lakh crore for fertiliser subsidies, which is about 70% of the budgeted amount for agriculture (Damodaran, 2026). This subsidy constitutes nearly 40% of the central government's total subsidy bill (Malani, 2025). Using targeted monitoring for specific farmer groups and regions within India, fertiliser subsidies could be reduced (Sharma, 2012).

Furthermore, there can be better monitoring of the smuggling of Indian fertilisers to neighbouring countries such as Bangladesh and Nepal. Several public sector fertiliser plants are old and highly inefficient, and could be replaced by plants to be set up by the private sector. Over time, the central government could save about 0.4 to 1% of GDP by reducing fertiliser subsidies and decreasing storage costs of excessively large stocks of food grains, particularly rice, in the Food Corporation of India's godowns. Such reforms could also focus on improvements in storage and distribution efficiency.

The government could also consider ways to reduce the overall cost of pensions for the armed forces. As average life expectancy in India has increased over time, retired armed forces personnel now receive pensions for relatively longer periods. Trained personnel could be retained till higher ages, thereby reducing the duration over which defence pensions are paid. This can be done gradually by raising retirement

ages across all ranks of the three services.[26] Pensions would begin later and be paid for shorter periods, while fresh recruitment could be moderated for some years to adjust to longer service tenures at the Jawan and higher levels. Table 7 below lists the retirement ages for various ranks of Army personnel.

Table 7: Retirement Age for Army Personnel

Rank*	Retirement Age
Jawan to Naik	42 to 49
Up to and including the rank of Major	50
Lieutenant Colonel	52
Colonel	52
Brigadier	54
Major General	56
Lieutenant General	58
General	60

Source: Ministry of Defence (1979).

*Note: *For armoured corps, infantry, artillery, engineers, and signals.*

The British had set up large cantonment towns such as Barrackpore, Delhi, Meerut, Bangalore, Pune, Ambala, Dehradun, and Jabalpur. As of the end of 2025, these cantonments are surrounded by urban areas that have developed over the last several decades. Substantial financial resources could be raised by leasing out portions of these large tracts of cantonment land, which are now well within urban areas.

It may be argued that there could be yet another cess on the sale of petroleum products, specifically to provide additional resources to the MoD. This would be going down a slippery slope as cesses tend to persist. Alternatively, with long maturity, 30 years or more, zero-coupon bonds could be issued by the central government after confirming that there would be sufficient investor interest in such a debt instrument. As of early 2026, the central government's resource constraints and the significant proportions of revenues spent on salaries and pensions of defence personnel constrain capital expenditure on weapons systems and R&D.

The following two paragraphs reproduce recommendations made by the Fifteenth Finance Commission (2020) on raising additional resources for defence expenditure:[27]

> ***"Creation of a non-lapsable fund for funding modernisation***
> *We recommend that the total amount of Rs. 1.53 lakh crore, as calculated on an annual basis should be earmarked for additional investment in defence capital expenditure and for capital expenditure on internal security.*

[26] The average life expectancy of Indians has gone up from about 60 in 2000 to 68 years in 2024.

[27] Refer to Appendix 4 for details on 15th and 16th Finance Commission analysis on defence expenditure.

The Union Government may constitute, in the Public Account of India, a dedicated, non-lapsable fund, Modernisation Fund for Defence and Internal Security (MFDIS), to bridge the gap between projected budgetary requirements and budget allocation for defence and internal security. This may be called Rashtriya Suraksha Naivedyam Kosh or any other appropriate name. The proceeds of the fund will be utilised for the following three purposes: (i) capital investment for modernisation of defence services; (ii) capital investment for CAPFs and modernisation of state police forces, as projected by MHA; and (iii) a small component as a welfare fund for our soldiers and para-military personnel.

Monetising Land

The MoD has substantial surplus land at its disposal. Monetisation of this can generate substantial resources if there is an effective and robust framework for the identification, valuation and disposal of such land. We, therefore, recommend that the MoD should, at the earliest, put in place a mechanism for generating additional resources from monetisation of land, including payments for defence land likely to be transferred to State Governments and for public projects in the future."

6. Domestic Production[28]

The structures that are currently in place to prevent incorrect or exaggerated production requirements for the armed forces are the DAC and the three bodies that report to it. These are the Defence Procurement Board (DPB), Defence Production Board (DPrB), and the Defence R&D Board.[29] Serious concerns about the wastage of financial resources have led to counterproductive consequences. Decision-making structures have too many levels of required approvals, resulting in not just time but also cost overruns. A lack of consensus across political, official, and armed forces circles about which weapons systems would be appropriate has at times also led to substantial time and cost overruns.

At India's independence, there was considerable dependence on weapons systems which had been sourced from the UK before 1947. Post-independence, the Soviet Union offered payment terms which were more affordable, particularly because India had systemic foreign exchange constraints. As of 2025, defence equipment is procured from domestic and a wide variety of foreign sources. If production facilities happen to be based abroad, there are labyrinthine approval procedures to avoid the type of controversies that dogged the imports of the Bofors guns from Sweden, HDW submarines from Germany, Augusta–Westland helicopters from Italy, Rafale fighters from France, and the selection of domestic "offset" partners.

[28] This section derives ideas from the *Emerging Technologies and India's Defence Preparedness* by K. Bommakanti, A. Vats, K. Nachiappan, S. Mohan, and Y. Joshi as well as *Of Matters Military – Defence Production and Mission 'Make in India,'* by Major General Mrinal Suman, 2021.

[29] Further details on the decision-making hierarchy are outlined in pages 106–107 of *India's Defence Economy* by L.K. Behera.

In the context of domestic defence equipment production, HAL was established before India's independence, in 1940, and has been a public sector company since 1964 (HAL, n.d.). Manufacturing at HAL began in 1942, when it started producing aircraft such as the Vultee A-31 Vengeance for what was then the British–Indian Air Force. More recently, since the 1980s, HAL has been involved in the licensed production of fighter aircraft such as the MiG-21, MiG-27, Dornier 228, and Sukhoi Su-30. HAL has also been involved with the production of helicopters and spare parts for internationally known companies such as Boeing and Airbus. Currently, HAL has 11 R&D centres and 21 manufacturing divisions. Yet its image has been dented by long delays in the production of an indigenous Light Combat Aircraft (LCA). As of the end of 2025, HAL has not produced engines for any type of aircraft or helicopter entirely on its own.

The DRDO was created in 1958 and employs about 5,000 scientists and another 25,000 technical and other staff. Among several initiatives, the DRDO has been responsible for the Integrated Guided Missile Development Programme (IGMDP) and LCA programme.[30] The IGMDP effort has led to the successful production of missiles with ranges of up to 5,000 km. However, the LCA project has been beset by substantial delays and cost overruns. Consequently, India has had to import engines from General Electric and other suppliers for its LCAs. There have also been deadline slippages, resulting in higher costs for DRDO projects such as the battle tank Arjun, aero-engine Kaveri, and air-to-air missile ASTRA.

It is apparent that DRDO's work needs to be reviewed. For starters, there seems to be inadequate interaction between DRDO and the three wings of the armed forces. This has caused long delays compared to estimated project completion dates. The report of the Kargil Review Committee, which was headed by K. Subrahmanyam, was submitted to the then Prime Minister A. B. Vajpayee on January 7, 2000. This report noted that defence procurement programmes were often out of date as threat circumstances changed. DRDO has been criticised by the CAG for a lack of timely delivery and inefficient use of capital.

From the beginning of the 21st century, the near monopoly of public sector entities in defence production has gradually declined as the private sector was allowed to participate in defence manufacturing. At the same time, the majority of publicly owned institutions, such as Mazagon Dock Shipbuilders Limited (MDL), Garden Reach Shipyard, and HAL, were brought under the direct supervision of the MoD. With the benefit of hindsight, this may be seen as a mistake. A better alternative would have been to make them autonomous. However, a contrary view could point to the achievements of state-owned defence equipment production in the USSR (now Russia) and China.

[30] Details about DRDO's transfer of technology to various Indian companies are listed in Appendix 7.

In the past 25 years, the MoD has often been unable to use its procurement budget because of lengthy procedural checks. This is partly because procurement proposals need to go through several government committees. Additionally, at times, there are differences of opinion between senior officers of the armed forces and the MoD officials, resulting in delayed decision-making. It seems there are ambiguities in the way requirements are drawn up by the users of defence equipment.

By mid-2025, there were nine large DPSUs, including HAL, 41 ODFs, 50 laboratories managed by the DRDO, and about 70 private sector companies engaged in the production of defence equipment.[31] The Indian government has also incrementally raised the permitted ceiling for foreign equity participation in defence manufacturing from 26% to 100%.

Tables 8 and 9 detail the central government's equity holdings in select DPSUs.

Table 8: Defence Public Sector Undertakings

DPSUs	Central Government Percentage Equity Share
HAL	75
BEL	51
BDL	75
BEML Ltd	54
Midhani	74
MDL	85
GRSE	-
GSL	51
HSL	100
AWEIL	100
GIL	100
Troop Comforts Ltd	100
AVNL	100
MIL	100
YIL	100
India Optel Ltd	100

Source: Individual Company Reports.

Note: DPSU = defence public sector undertaking; HAL = Hindustan Aeronautics Ltd; BEL = Bharat Electronics Ltd; BDL = Bharat Dynamics Ltd; BEML = Bharat Earth Movers Ltd; Midhani = Mishra Dhatu Nigam Ltd; MDL = Mazagon Dock Shipbuilders Ltd; GRSE = Garden Reach Shipbuilders and Engineers Ltd; GSL = Goa Shipyard Ltd; HSL = Hindustan Shipyard Ltd; AWEIL = Advanced Weapons and Equipment India Limited; GIL = Gliders India Ltd; AVNL = Armoured Vehicles Nigam Ltd; MIL = Munitions India Ltd; YIL = Yantra India Ltd.

[31] Refer to Appendix 5 for defence stocks performance in May.

The OFB was split into seven companies in 2021, and all seven are fully owned by the government. None of these seven companies has been listed on Indian stock exchanges as of the end of 2025. Consequently, the operations and finances of OFB's constituent seven companies are not sufficiently transparent. Given that OFB has over 82,000 employees and is second only to HAL in terms of production, it is time for OFB companies to be listed. Such a step would bring greater transparency to OFB's finances and production details.

Table 9: Defence Public Sector Undertakings as of 2018–2019

DPSU/ OFB	Year of Incorporation	Production (INR billion)	Employees	R&D Expenditure (INR billion)	Export (INR billion)
OFB	1802	128.66	82,237	0.91	2.65
HAL	1964	185.38	28,345	14.64	4.05
BEL	1954	119.21	9,612	10.77	1.51
BDL	1970	32.25	3,034	0.53	0.66
BEML	1964	34.67	7,185	0.71	0.19
Midhani	1973	8.15	791	0.30	0.08
MDL	1934	46.49	6,933	0.85	0
GRSE	1960	13.79	2,100	0.85	0.05
GSL	1967	8.48	1,604	0.10	0.15
HSL	1952	5.95	1,028	0	0

Source: Behera (2020b).

Note: HAL = Hindustan Aeronautics Ltd; BEL = Bharat Electronics Ltd; BDL = Bharat Dynamics Ltd; BEML = Bharat Earth Movers Ltd; Midhani = Mishra Dhatu Nigam Ltd; MDL = Mazagon Dock Shipbuilders Ltd; GRSE = Garden Reach Shipbuilders and Engineers Ltd; GSL = Goa Shipyard Ltd; HSL = Hindustan Shipyard Ltd; DPSU = defence public sector undertaking; OFB = Ordnance Factory Board; R&D = research and development.

It should be noted that several other defence equipment manufacturing companies, which are majorly owned by the Indian government, have been listed on the Bombay Stock Exchange and the National Stock Exchange. Table 10 provides the names of Indian public and private arms manufacturing companies which have been listed.

Table 10: Listed Public and Private Arms Manufacturing Companies

Company	Market Capitalisation (in INR crores)	Sector
HAL	3,35,531	Aerospace and Defence Equipment
MDL	1,36,524	Shipbuilding
BDL	72,381	Missiles and Ammunition
Data Patterns India Ltd	16,500	Defence Electronics
Paras Defence and Space Technologies	6,419	Aerospace and Defence Technologies
Sika Interplant System	1731	Aerospace and Defence Engineering
Taneja Aerospace and aviation	990	Aerospace Aerostructures
High Energy Batteries	643	Defence Batteries
ideaForge Technologies	2306	Defence Drones
TechEra Engineering	277	Defence Engineering

Source: Moneycontrol (n.d.).

Note: HAL = Hindustan Aeronautics Ltd; BDL = Bharat Dynamics Ltd; MDL = Mazagon Dock Shipbuilders Ltd.

Currently, the Indian private sector's share in defence production is limited. Table 11 shows that this share was 23% in FY 2019–2020.

Table 11: Share of Defence Public Sector Undertakings and Private Sector in India's Defence Production

	DPSUs (INR billion)	OFBs (INR billion)	Other PSUs/ JVs (INR billion)	Private Companies (INR billion)	Total (INR billion)	Share of Private Sector (percentage)
2016–2017	404.3	148.3	47	141	740.5	19
2017–2018	434.8	148.3	51.8	153.5	788.4	19
2018–2019	448.3	128.1	55.7	173.5	805.6	22
2019–2020	301.3	54.7	43.3	118.8	518.1	23

Source: Behera (2020b).

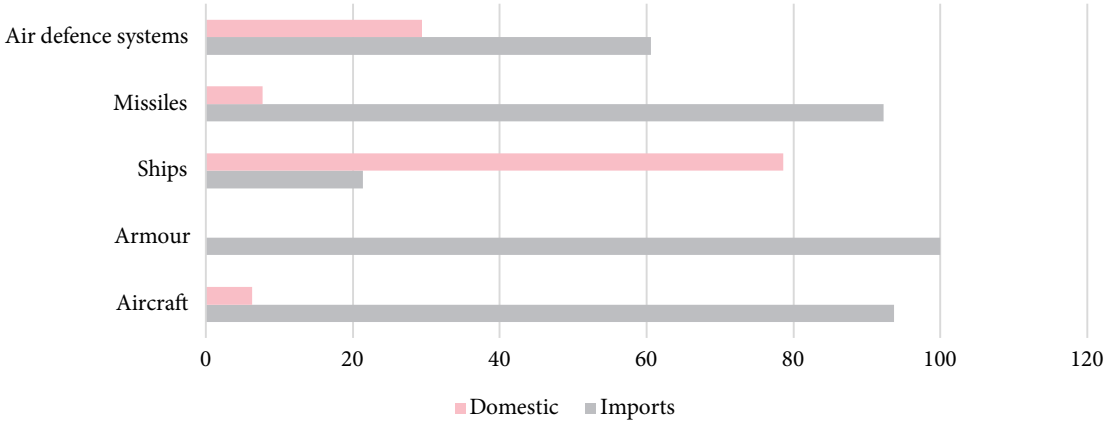
Note: DPSU = defence public sector undertaking; OFB = Ordnance Factory Board; PSU = public sector undertaking; JV = joint venture.

7. Dependence on Foreign Suppliers

India has been one of the largest importers of military equipment for decades, and Figures 9 and 10 confirm this. According to the Stockholm International Peace Research Institute (SIPRI), around 84% of major conventional weapons[32] were procured from foreign sources between 2016 and 2020.

Figure 9 indicates that India's dependence on foreign suppliers is highest for armour, at 100%, followed by aircraft and missiles at over 90% each.

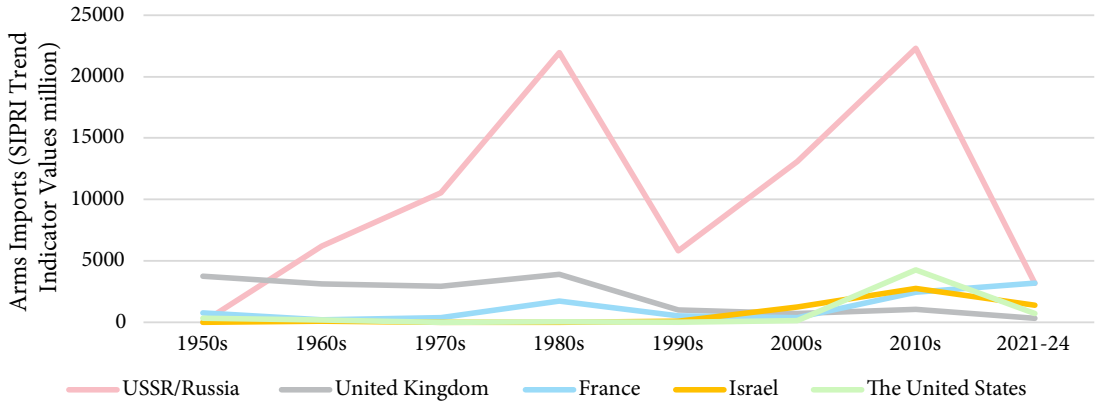
Figure 9 India's Domestic vs Imported Share of Arms Procurement by Category (in Percentage) (2016–2020)



Source: Stockholm International Peace Research Institute (n.d.).

The MoD would likely contest these SIPRI estimates as overstated. Be that as it may, it appears that the Indian defence manufacturing sector has considerable ground to make up relative to defence equipment producers in the developed West, Russia, and China.

Figure 10: India's Major Arms Suppliers, 1950–2023[33]



Source: Stockholm International Peace Research Institute (n.d.).

Note: SIPRI = Stockholm International Peace Research Institute.

[32] Includes air defence systems, naval vessels, armoured vehicles, artillery, and other missile systems.

[33] TIV is a metric developed by the SIPRI to measure the volumes of transfers of major conventional weapons. TIV does not represent the financial value. Instead, it is a standardised indicator based on estimated cost of production of weapon systems intended to enable consistent comparison across countries and over time.

Figure 10 shows SIPRI's analysis, which is derived from the think tank's "Trend Indicator Values" (TIV) parameter. It provides a measure of import comparability across countries. It is apparent from Figure 10 that while imports from the UK have decreased steadily since the 1950s, those from the USSR (Russia) rose sharply till the 1980s, then fell substantially and rose again till about 2010. Imports from Israel picked up from the mid-1990s and are comparable in TIV terms to acquisitions from countries such as the US. There are strategic and foreign policy implications of the sharp reduction in arms imports from Russia and the rise in such acquisitions from Israel.

As for the US, India has been a major defence partner since 2016 and enjoys Strategic Trade Authorisation Tier 1 (STA-1) treatment under the US Export Administration Regulations (EAR), which places India at par with NATO members for technology sharing and licensing, thus easing the process of obtaining key defence items. However, the US's International Traffic in Arms Regulations (ITAR) strictly control the export of military items on the US Munitions List. Separately, the US Bureau of Industry and Security (BIS) regulates arms and dual-use technology exports to India under the EAR. Licensing is mandated for almost all sophisticated US equipment and for manufacturing know-how.

Although basic platforms can be sold to India, the US is reluctant to transfer cutting-edge, critical "Black Box" technologies (e.g., source codes for missile guidance, core jet engine technology, and advanced sensor algorithms) required for production. These restrictions are central to US export prohibition laws, which are clearly designed for the US to retain a technological edge. Additionally, the US Countering America's Adversaries Through Sanctions Act (CAATSA) targets transactions with Russia, Iran, and North Korea and creates uncertainties for India, having received a US waiver for the import of the Russian S-400 missile defence system. Given India's dependence on Russian spares and equipment, which affects its overall external security readiness, CAATSA remains a threat to future US–India defence deals.

India's defence relationship with the US was referred to in a notification dated January 25, 2025 (US Department of State, 2025). The following extract explains the legal umbrella under which US companies can collaborate with India: *"In 2016, the United States designated India as a Major Defence Partner. Commensurate with this designation, in 2018, India was elevated to Strategic Trade Authorisation tier 1 status, which allows India to receive license-free access to a wide range of military and dual-use technologies regulated by the Department of Commerce."* To sum up, US arms export decisions are shaped not only by technology-leakage and security concerns but also by broader political factors (O'Hanlon et al., 2025).

Although India is dependent on imports of defence equipment, there have been instances of successful co-production with foreign counterparts. For example, the BrahMos missiles have been manufactured with Russian technical support. Similarly, India is set to manufacture the Russian AK-203 assault rifles through a JV called

Indo-Russian Rifles Private Limited, with 50.5% equity held by India's Advanced Weapons and Equipment, Munitions Limited (AWEIL).[34]

As of the end of 2025, a financial anomaly in the import of defence equipment, irrespective of the country of origin, is that if it is imported in finished condition, there is no import duty. However, if parts are imported for domestic end production, such parts are subject to import duties. Clearly, all imports of equipment for the defence sector should be granted priority or infrastructure status, and there should be no duties. A counterargument could be that imports of so-called defence sector parts may be diverted for other end purposes. To prevent such diversion, corresponding penalties could be made very high.

The following three paragraphs are extracts from a contribution by defence expert Ajai Shukla in an anthology published by Routledge in 2023 titled *How Realist is India's National Security Policy,* Bajpai, K. (2023). The first paragraph refers to advances made by the private sector and the DRDO in producing artillery systems, as well as HAL's role in upgrading imported fighter aircraft. India's dependence on Russia and Israel is discussed in the second and third paragraphs.

> *"In fact, much of the equipment that features on the import-embargoed list is already being procured by the military from indigenous sources. The K-9 Vajra self-propelled artillery gun is already being built near Pune by Larsen & Toubro (L&T), while the DRDO is developing the Advanced Towed Artillery Gun System (ATAGS) and the Pinaka multi-barrelled rocket launcher (MBRL) in partnership with private sector firms – L&T, the Tata Group and the Kalyani Group. The overwhelming majority of the navy's warships and submarines are already being built in Indian shipyards, while Hindustan Aeronautics Ltd (HAL) has licence-produced the Sukhoi-30MKI and Tejas fighters for two decades. HAL also upgrades the Jaguar, Hawk and Mirage 2000 aircraft. Meanwhile, the Ordnance Factory Board has long built the army's entire requirement of T-90 and Arjun tanks at Avadi, and infantry combat vehicles at its Medak factory. With India's automobile industry capable of supplying world-class ground transport vehicles to the military, there is little need to import in that category.*
>
> *Without continuous back-up from Russia, India's military would quickly grind to a halt. But in arms supplies, as elsewhere, there are no free lunches. In return for keeping its legacy fleet running, New Delhi faces unsubtle pressure from Moscow to continue buying weaponry from Russia. In some cases, such as the $1.3 billion purchase of the 9K338 Igla-S Very Short-Range Air Defence System (VSHORADS), New Delhi is being arm-twisted into buying a 16-year-old missile that the Russian military itself replaced in 2014 with the far more capable 9K333 Verba missile. In other transactions, such as the Indian Navy's 10-year lease of an Akula-class nuclear-propelled attack submarine (SSN), or India's $5.4 billion acquisition of five regiments of the S-400 Triumf advanced air defence systems, there is a compelling*

[34] Appendix 8 provides summary information on transfer of Russian equipment and technology to India.

techno-economic logic for India to buy high-end Russian equipment that is available from nowhere else.

An example of how Israel played this game is its building of the Phalcon Airborne Warning & Control System (AWACS) for the IAF. This airborne radar, mounted on a Russian IL-76 aircraft, enables airborne flight controllers to monitor and control airspace for hundreds of kilometres around. No Israeli company had ever designed such an AWACS before, which required integrating an Israeli radar onto a Russian aircraft. India paid over US $1.1 billion (Rs 5000 crores) to Israel Aerospace Industries (IAI) and Elta, enabling hundreds of Israeli designers to learn on the job. Having developed expertise in Indian money. Israel then built another three AWACS for India, several for the Israeli Air Force and exported more to Chile and Singapore. Israel's game plan involved a high degree of confidence in its defence industry."

8. Unmanned Aerial Vehicles or Drones

8.1 Landscape of Developing Unmanned Aerial Vehicle Technology in India

While UAVs represent an increasingly valuable and cost-effective form of technology, they cannot fully substitute for manned aircraft. Furthermore, drones have limitations with respect to range and payload capacity. By comparison, missiles launched from fighter aircraft continue to provide better reach. However, drones play a critical role in Intelligence, Surveillance, and Reconnaissance (ISR) activities and are an indispensable component of modern warfare strategy.

Several Indian start-ups are working to develop military-grade UAVs which can be used by India's defence sector. Table 12 lists a few start-ups and their primary products.

Table 12: List of Indian Start-ups Developing Unmanned Aerial Vehicle Technology

Name	Products	Stage
Maraal Aerospace	• Fixed-wing solar UAVs: Their application includes ISR missions, maritime science, search and rescue, mapping, environmental protection, agri-tech, etc. • High Altitude Pseudo Satellite: A pseudo-satellite can provide services towards efficient border patrolling, tracking movements deep into the enemy territory, or in the deep seas.	Incubated with IIT Kanpur
Nitrodynamics Aerospace & Defence Pvt Ltd	• Sky Guard drones: Useful for border security. • Flacon series: Tactical drones for delivering real-time intelligence on enemy communications and radar systems.	Incubated with IIT Kanpur
Garuda Aerospace	• Surveillance drones and border security.	Late Stage
IdeaForge	• UAVs for anti-terror: detection and surveillance.	Late Stage (IIT Bombay incubated)

Source: Individual company reports.

Note: UAV = unmanned aerial vehicle; ISR = intelligence, surveillance, and reconnaissance; IIT = Indian Institute of Technology.

8.2 Fighter Jets Versus Drones

Although in many cases it can be argued that drones' significantly lower cost than fighter jets make them more cost-effective, that is not necessarily true. Comparability varies across countries, as the capabilities of both differ in the number of times they can be used, the payloads they can carry, and the costs of maintenance and operations beyond procurement.

Therefore, which is better depends on what it will be deployed for and from where.

- Cost differences: The overall costs of drones, including operating, maintenance, and fuel costs, are much lower than those of fighter jets.

(a) India's kamikaze drones

Type	Cost (INR lakh)
Short range, quick strikes	3–5
Tactical loitering drones (military and paramilitary usage)	10–25
High-tech	30

(b) Fighter jets versus drones

Fighter Jets	Cost (in USD)	Drones	Cost (in USD)
Rafael	285 million	Elbit Skystriker	105,000
F-35 Lightning fighter jet	80 million + millions per annum in operations	MQ-9 Reaper	32 million
B-2 Spirit stealth bomber	2 billion		
F-35A	160 million	Predator	3–4 million

- Usage: The two have their pros and cons.

Metric	Fighter Jet	Drones
Operating time	Fighter jets need refuelling beyond 3–4 hours	Drones like Predator can operate for longer than 3–4 hours
Number of uses	Reusable Rafael	Elbit Skystrikers are one-time use (suicide weapons)
Payloads	Rafael can carry 9,500 kg	Israeli Harop 23 kg
Speed	Rafael's speed is Mach 1.8	Israeli Harop 417 kmph
Communication	Not vulnerable to frequency-based interruptions	Navigating from base is vulnerable to frequency disruptions
Targeted Strike		More precise

8.3 The Evolving Economics of Warfare: Usage of Drones in the Iran–US/Israel Conflict

On February 28, 2026, the US and Israel launched large-scale attacks on Iran. In response, Iran targeted energy facilities and buildings across the Gulf Cooperation Council (GCC) states and Israel. This cycle of attack and retaliation continued throughout March 2026 (Center for Preventive Action, 2026).

This conflict has shed light on the evolving nature of modern warfare. Iran has used layered strikes involving drones and missiles. Drones have emerged as a retaliatory measure of sorts for Iran, much as they have for Ukraine in its conflict with Russia. It is estimated that, in the first week of Tehran's retaliation, drones accounted for 71% of the recorded strikes on GCC states (Zakaria, 2026).

Table 13: Tehran's Strikes on Gulf Cooperation Council States

	Drones	Missiles
Opening strikes	867	339
Strikes on the UAE	1422	246

Source: Zakaria (2026).

Table 14: Cost Comparison of Drones and Interceptors

Type	Cost (in USD)
Shahed-drone	35,000
Patriot interceptor	4 million

Source: Zakaria (2026).

Historically, military warfare has relied on technologically sophisticated equipment such as fighter jets and cruise missiles. The Russia–Ukraine conflict has also highlighted the increasingly important role of UAVs. According to media reports, Ukraine smuggled drones deep into Russia to strike regions far from the Ukraine–Russia border. This appears to be a relatively cost-efficient mode of spying on and attacking enemy locations. Da-Jiang Innovations (DJI), a Chinese company, is reported to be the world's largest commercial drone manufacturer, holding about 80% of the global consumer drone market. In September 2024, China imposed restrictions on the sale of drones and critical components, including flight controllers, carbon frames, motors, radio modules, and navigation cameras, to Ukraine and Russia.

8.4 Satellite Surveillance

India is in the process of launching 52 dedicated surveillance systems. The Indian government has approved USD 3.2 billion for the SBS-III programme to develop next-generation satellites. Under this programme, the Indian Space Research Organisation (ISRO) will manufacture and launch the first 21 satellites while private companies like OneWeb, Jio-SES, and Starlink will handle the remaining 31 (Das & Grover, 2025). The Defence Space Agency (DSA) will oversee the operation of the newly launched satellite system (The Hindu, 2025a).

9. Feedback from Indian and Foreign Private Companies on India's Defence Manufacturing Sector[35]

9.1 Indigenous Production

The "Make in India" initiative, launched in 2014–2015, aims to reduce India's dependence on imports and promote domestic manufacturing.[36]

- For the defence sector, a Strategic Partnership model was introduced to facilitate collaboration between Indian private firms and foreign Original Equipment Manufacturers (OEMs) to build submarines, helicopters, and fighter aircraft. While a programme under this route has yet to be fully implemented, its introduction signalled the government's intention to position private players as collaborators alongside public sector counterparts.
- Another important move was the liberalisation of FDI in defence, which increased from 24 to 49% in 2016, and then to 74% in 2020 under the automatic route. This has made it more attractive for foreign OEMs to form JVs with Indian companies and has the added benefit of facilitating technology transfer and building local capability.
- In 2021, the OFB was corporatised, which was a long-awaited reform. This broke the monopoly of the OFBs in certain product lines and also created space for partnerships with private sector companies, enabling innovation and competitiveness in areas that had previously been closed off.
- Another initiative was the introduction of Positive Indigenisation Lists. Five such lists have been released so far, banning the import of over 5,500 items. Of these, around 3,000 had been indigenised as of 2025. To an extent, this policy appears to be guided more by optics, since many larger systems and emerging technology areas have been kept out. However, this policy does provide a demand signal and growth impetus to the domestic industry.
- On procurement, the DAP 2020 tilted the balance in favour of the Indian industry. It elevated the "Buy Indian IDDM" to a higher priority category.
- The iDEX initiative was launched in 2018 as a forward-looking measure. It focuses on start-ups and innovation by providing funding and support to solve defence challenges.
- The MoD has progressively set aside around 75% of the modernisation budget for domestic procurement.

[35] This section is based on comments from domestic and foreign private companies. A structured questionnaire was prepared ranging from budgetary issues to import dependence, with a focus on private sector participation. We reached out to four private sector companies and two DPSUs. These were the Tata and Adani groups, L&T, and Lockheed Martin. We received on the record comments from L&T, Adani group, and few off-the-record comments from others. We did not receive responses from Bharat Forge, HAL, and BEL. These comments were received in conversations with the authors of this paper or were provided in writing.

[36] In the 2026–2027 budget, the MoD has retained 75% of the modernisation budget for procurement from Indian industry. This budget allocated INR 1.39 trillion to domestic manufacturers including private companies.

9.2 Suggested Changes in Transparency, Procurement, and Regulations to Make Indian Private-Sector Participation Financially Viable

Establishment of a dedicated procurement wing:

- A procurement wing comprising career professionals with expertise in technical, financial, and commercial domains is critical. This wing should be granted greater discretionary powers and operational autonomy so that it can take timely and informed decisions.
- A strong case exists for remodelling the current acquisition department into an organisation akin to France's Directorate General of Armaments (DGA) or the US Defence Contract Management Agency (DCMA). These agencies bring domain competency, speed, and accountability to defence procurement, and India would benefit from a similar model.

Time-bound, streamlined acquisition framework:

- One of the most critical changes needed is a significant reduction in procedural timelines across the acquisition lifecycle.
- This includes fast-tracking movement from pre-Acceptance of Necessity (AoN) to AoN, from AoN to Expression of Interest (EoI), and subsequently from EoI to Project Sanction Order (PSO). Establishing strict deadlines for each milestone, backed by empowered project teams, would help indigenous development projects move more swiftly and with greater accountability.
- Development contracts should incorporate risk-sharing models, such as cost-plus arrangements or milestone-based payments.

Introduce price premiums for higher indigenisation:

- To truly incentivise self-reliance, government policy should go beyond the current IDDM threshold of 50%. A graded price-premium structure could be introduced for solutions that achieve the following percentages: >60, >70, >80, and >90 of indigenous content. This would encourage deeper domestic value addition and promote investment in local supply chains and technology development.

Single-window trials and parallel testing:

- Today, sequential trials across multiple locations extend production cycles by years.
- This could be replaced by parallel, combined trials with pre-agreed test matrices.

Contracting and cash-flow discipline:

- Strict 30- or 60-day payment service-level agreements after milestones are needed, along with automatic payment of interest on delayed payments.

- Long-cycle contracts should include indexed price variation.

Multi-year demand signalling:

- The MoD should publish a rolling five-year capital acquisition plan, with the following:
  - Scheme-wise committed liabilities;
  - Scheme-wise available headroom;
  - Year-wise procurement pipelines.
- This would allow the industry to plan capacity and investment based on clear, quantifiable visibility.

Faster, more efficient source selection:

- Where appropriate, and not solely based on the lowest tender, source selection should reward credible technology and mitigation of delivery risk. A quicker rationalisation and single-shot, multi-site trials would also help compress timelines.

Innovation and intellectual property:

- Fast-track pathways from AoN to contract award should be created for successful prototypes.

Budget execution transparency:

- Quarterly capital utilisation should be published, and the 75% domestic capital expenditure allocation, as well as the private-sector sub-allocation, should be ring-fenced to support industry investment.

Exports and compliance:

- India should create a single-window defence export-clearance system aligned with its commitments under the Special Chemicals, Organisms, Materials, Equipment, and Technologies (SCOMET) framework, Wassenaar, Missile Technology Control Regime (MTCR), and Australia Group. It should also expand lines of credit and export-credit insurance for Indian PRIMES[37] and micro, small, and medium enterprises (MSMEs). India's membership in these regimes underpins responsible export growth.

The following are a few facts about the Indian private sector's involvement in the defence sector manufacturing:

- Over the past three decades, private Indian companies have invested in develop-

[37] PRIMES refers to major OEMs and prime contractors—both public (DPSUs) and private companies responsible for designing, developing, and manufacturing major platforms under the *Aatmanirbhar Bharat* (self-reliant India) initiative.

ing indigenous capabilities across design, prototyping, system integration, and lifecycle support.

- In the naval domain, a private Indian company has delivered complex platforms such as interceptor boats, Offshore Patrol Vessels (OPVs), and key submarine systems—all indigenously designed and built.
- The Indian private sector is also developing the indigenous Light Tank with DRDO.
- Regarding space, the Indian private sector has worked with ISRO to manufacture launch vehicle and satellite hardware and is currently associated with assembling India's first private Polar Satellite Launch Vehicle (PSLV) with HAL.
- In aerospace, an Indian private sector company has delivered the first set of LCA wings to HAL.

On the downside, private sector participation in India's defence industry remains limited and is constrained by the dominance of DPSUs. Despite substantial interest and ability among private players, DPSUs continue to receive preferential treatment from the government and have limited accountability for performance outcomes. Higher accountability and performance-linked funding would be beneficial for Indian defence manufacturing.

India allocates considerable amounts for defence expenditure. However, due to procedural delays, substantial portions of the defence budget remain unspent at the end of the fiscal year. The unutilised funds are reallocated to less critical or "low-yield" areas of expenditure, thereby reducing the overall efficiency of defence budget utilisation.

Regarding specific equipment, there should not be prolonged differences of opinion within the government, as was the case between the Indian Army and the DRDO when the Army registered a global request for information (RFI) for a Future Combat Ready Vehicle (FRCV). It is understood that this RFI was perceived by DRDO as a way of sidelining its own Future Main Battle Tank (FMBT). DRDO had started working on the FMBT in 2010. There is insufficient accountability in terms of time deadlines, whether for domestic production of defence equipment or acquisition from foreign sources. More broadly, there appears to be insufficient trust and coordination among the users of defence equipment, namely the three wings of the armed forces, public sector agencies, and private Indian companies engaged in the production of defence equipment.

9.3 India's Spending on Modernising its Conventional Weapons Arsenal

For FY 2025–2026, the allocation for capital outlay is INR 1.80 lakh crore, or about 26–28% of the defence budget. This is higher than in FY 2024–2025, but it remains well below the level needed to refresh major platforms and munitions rapidly.

- Revenue heads crowd out modernisation: Pay, pensions, and operations absorb roughly 70% of total defence expenditure, leaving less than 30% for new capital procurement. This structural tilt towards personnel costs limits annual replacement and force multiplication.
- For years, the Parliamentary Standing Committee has recommended moving towards approximately 3% of the GDP for defence to ensure preparedness. India's spending has remained well below that level, at about 1.9% of the GDP on MoD heads in the BE for 2025–2026.
- Execution and carry-through: MoD utilisation has improved, with more than 50% of FY 2025–2026 capital spending completed by September and 100% capital-expenditure utilisation in FY 2024–2025. However, committed liabilities leave limited headroom for new procurement, stretching timelines for air defence, artillery, submarines, fighters, helicopters, and precision munitions.
- Technology lag: While there is a strong push for self-reliance, the dedicated budget for defence R&D remains a relatively small share of overall defence expenditure.
- Long-term planning disconnect: Year-to-year budgetary allocations, while signalling intent, often do not align sufficiently with the long gestation periods required for major conventional weapons procurement programmes. This leads to contractual delays and escalation in costs, effectively reducing the actual modernisation achieved per rupee spent.
- Legacy systems burden: A significant portion of India's conventional inventory still comprises legacy systems, many of which are nearing obsolescence. The cost of maintaining these systems diverts resources from new acquisitions.

In FY 2024–2025, India's defence production was valued at INR 1.5 lakh crore, and the DPSUs contributed 71.6% of the amount. In the same FY, 66% of India's exports of defence equipment were contributed by the private sector. To this extent, it appears that the Indian private sector does have the capability to manufacture sophisticated defence equipment.

Among the reasons for the lack of a level playing field is preferential treatment in favour of the DPSUs. The following are examples of such differential treatment.

- The DAP lists priorities for capital procurement, but orders for these processes, as stated in the DAP document, do not apply to the DPSUs.[38]
- Application processes state different procedures for foreign companies, private players, and DPSUs. The bureaucratic nature of this process requires private players to provide more documentation. Such requirements are not similar for DPSUs and foreign players, who have to follow relatively easier processes.
- The differences in contracts, lack of letter of credit to private players, and indemnity bonds for DPSUs all add to such preferential treatment.

9.4 Why Does the Defence Public Sector Undertaking Model "Fail" so Often in India?

DPSUs are not sufficiently accountable. This basic shortcoming inhibits the DPSUs from producing better outcomes, particularly those that involve cutting-edge technology.

9.5 Significant Shortcomings and What Could be Done to Improve Outcomes

Avoid preferential treatment for DPSUs: The practice of nominating these undertakings for contracts should be discontinued to enhance competition and improve product quality. At present, they receive differential treatment and access to lower-cost capital, which channels substantial funds to DPSUs without commensurate returns on investment. Reducing such preferential access and avoiding excessive procedural burdens on private firms would not compromise national security, particularly since foreign private companies already operate under less restrictive processes.

Reform the composition and functioning of the DAC: The DAC, chaired by the defence minister, includes the procurement heads of DPSUs but lacks representation from the private sector. This structure reinforces preferential treatment for DPSUs in procurement decisions. Introducing private-sector participation in such discussions would help ensure more balanced and competitive decision-making.

India's defence manufacturing capability continues to be constrained by technical deficiencies in building and weaponising equipment for the three wings of its armed forces. The specific areas in which these deficiencies still limit capability are as follows:

(a) High-end propulsion: India remains dependent on foreign technology for jet engines, advanced marine gas turbines, high-power-density engines, and indigenous nuclear and electric propulsion. This limits the country's ability

[38] Except for medical equipment, the DAP covers all capital acquisitions undertaken by the MoD, Defence Services, and Indian Coast Guard from indigenous sources and via imports. DRDO, OFB, and DPSUs continue to follow their own procurement procedures.

to produce indigenous fighters, long-endurance UAVs, and next-generation warships without foreign dependence.

(b) Sensors, seeker technologies, and electronic warfare: State-of-the-art seekers, optronics, Radio Frequency (RF), and Electronic Warfare (EW) suites,[39] infrared search and tracking, long-range precision guidance, and multi-spectral sensor fusion remain partly dependent on foreign technology.

(c) Armoured vehicle powerpacks:

Advanced materials and manufacturing science:

- Deficits remain in special alloys, stealth materials, high-temperature composites, miniaturised components, microelectronics, and radiation-hardened electronics.
- These capabilities are fundamental to modern air platforms, missile technology, and naval survivability.

(d) Mission-critical testing, certification, and quality assurance (QA)40 infrastructure:

- India still lacks adequate test ranges, wind tunnels, hardware-in-the-loop and software-in-the-loop test beds (HIL/SIL), EW proving grounds, and flight-test capacity to shorten development cycles.

This slows down production even when capabilities with respect to core technologies exist.

(e) Defence electronics and semiconductor ecosystems:

- There is heavy dependence on imported microelectronics, sensors, Field Programmable Gate Arrays (FPGAs), RF modules,[41] and high-end processors.
- This limits autonomy in missiles, avionics, radars, and communication systems.

9.6 Technological Constraints and Research and Development

India lags in defence manufacturing not just due to significant funding shortages but also because of technological gaps. For example, the ongoing development of the Advanced Medium Combat Aircraft (AMCA), a fifth-generation fighter, reflects these challenges. Although India has made progress, the gestation period has been too long. Considering that the first stealth aircraft emerged in the early 1990s, India remains approximately four decades behind in this area of military manufacturing technology.

[39] EW suites in the Indian defence sector are advanced, indigenous, and imported electronic systems designed to detect, intercept, classify, and jam enemy radars and missiles, thereby enhancing the combat survivability of warships, aircraft, and helicopters. Developed by DRDO labs like DLRL and manufactured by BEL, these systems, such as Shakti and Swayam Raksha Kavach (SRK), integrate Electronic Support Measures (ESM), Electronic Countermeasures (ECM), and Missile Approach Warning Systems (MAWS).

[40] QA in the Indian defence sector refers to the systematic monitoring, inspection, and certification of military equipment to ensure it meets strict quality, safety, and reliability standards before reaching the Armed Forces. It is primarily managed by the Directorate General of Quality Assurance (DGQA) (for Army/Navy) and Directorate General of Aeronautical Quality Assurance (DGAQA) for the Air Force.

[41] Used to create secure systems for defence and other applications.

A major limitation in India's defence ecosystem is inadequate investment in R&D. Currently, only about 5% of the defence budget is devoted to R&D activities. Furthermore, institutional bottlenecks within DRDO impede effective ToT. For example, a foreign OEM proposed the introduction of a lower-limb exoskeleton to be developed in the private sector. However, this proposal was turned down by DRDO.

Conclusions

If any reminder was needed, it is even more apparent, following the first fourteen months of President Donald Trump's second term, that strategic realities around the world have changed dramatically for decades to come. The unprovoked bombing of Iran by the US and Israel, which began on February 28, 2026, is yet another reminder that national security and the safety of citizens have to be underwritten by military strength. It follows that India needs to augment its conventional weapons capabilities, or it may face negative surprises along its borders or even serious challenges to its territorial integrity. Given India's resource constraints, differences of opinion have at times cropped up between the MoD and the Ministry of Finance on defence sector funding. Two examples are the cost and time overruns in the production and research objectives of HAL and DRDO.

Over the years, as administrative expenses, including salaries and pensions, have risen, India's military hardware has not kept pace with security-related challenges. Among other reasons, this is because expenditure on weaponry has not kept pace with the rise in salaries, pensions, and administrative costs. As a percentage of GDP, India's defence expenditure declined from 2.5 to 1.9% between 2013 and 2025. A more appropriate way to assess the adequacy of defence expenditure is to measure it as a fraction of the central government's total revenues. That figure has also declined over the same 12 years, from 26 to 22%. As of the end of 2025, the central government owns majority equity shares in several DPSUs. Among other measures to augment defence funding, small fractions of the government's equity holdings in listed DPSUs could be sold.

All things considered, what could the Indian government do to promote sophisticated defence sector manufacturing within the country? Given the large numbers of postgraduates in the physical sciences and engineers with various specialisations, there is sufficient scientific and engineering talent within India. It is perhaps the inability or unwillingness of the Indian government and the private sector to compensate exceptional scientists and engineers at levels comparable to those in developed countries that constitutes the principal roadblock.

Looking around the world, the US, Russia, and China are the largest manufacturers of cutting-edge defence equipment. However, they have significantly different ownership and management structures. In the US, although planning and the technologies that are financially supported are determined by the US government, and if required by the US Congress, almost all defence sector manufacturing is undertaken by private US-based companies. Russia and China have central government-controlled administrative–economic systems with most critical manufacturing undertaken in government-owned establishments. In India, for far too long, government-owned bodies have not achieved sufficiently close to cutting-edge manufacturing of sophisticated weapons systems at best international standards. An example of the very latest advances is the so-called "autonomous weapons" developed by a US-based company called Anduril.[42] India would benefit from higher domestic and foreign private sector participation in defence manufacturing.

To sum up, it is not all gloom and doom, as India's technical capabilities in defence manufacturing are expanding and are globally competitive in several silos. However, these remain inadequate for full-spectrum indigenous defence manufacturing compared to G7 countries, Russia, China, and Israel. India's constraints are not merely financial—these are rooted in a relatively shallow base in supply chain depth and width, due principally to inadequacies in indigenous R&D.

[42] Anduril Industries is a US-based defence technology company founded in 2017 by Palmer Luckey, focused on transforming military capabilities through artificial intelligence-powered autonomous systems. It builds software-defined intelligent hardware for land, sea, and air—such as drones and sensors—to enhance surveillance, security, and combat, aiming to outperform traditional defence contractors with lower-cost innovation.

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Appendices

Appendix 1: Stock of Nuclear Weapons (Kristensen & Korda, 2025)

Table A–1: Nuclear Weapons

Country	Number of Warheads	Deployed/Available
Russia	4,309	Slight decrease
US	3,700	Stable military stockpile
China	600 (up from 500 in 2024)	132 assigned to launchers
France	290	Stable
UK	225	-
India	180	Growing
Pakistan	170	Stable, growing
Israel	90	-
North Korea	50	Not deployed

Source: Stockholm International Peace Research Institute (n.d.).

Note: Data as of January 2025.

- Total estimated nuclear warheads: 12,241
  - Military stockpiles (available for use): approximately 9,614
  - Deployed with missiles/aircraft: approximately 3,912
  - On high operational alert: approximately 2,100 (almost all Russian or US)
- Nuclear-armed states: US, Russia, UK, France, China, India, Pakistan, North Korea, and Israel.
- The US and Russia together possess almost 90% of all nuclear warheads.

Modernisation of Nuclear Weapons:

1. US:

- Modernisation Scope: Extensive programmes to modernise and replace nuclear warheads, aircraft, missiles, and submarine delivery systems, and production facilities.
- Strategic Forces:
  - ICBMs: Replacing LGM-30G Minuteman III with LGM-35A Sentinel.
  - Nuclear-powered ballistic missile submarine (SSBNs): Replacing Ohio-class submarines with Columbia-class.
  - Bombers: Replacing B-2A with B-21 Raider.
- Warheads and Infrastructure: Modernising warheads for all delivery systems and upgrading nuclear command, control, and communication infrastructure.
- Recent Activity: Delivered over 200 modernised nuclear weapons in 2023–2024, the most in a single year since the Cold War.

2. Russia:

- Modernisation Scope: Nearing completion of strategic nuclear force modernisation.
- ICBMs: Replacing Soviet-era missiles with Sarmat (SS-29), Yars (SS-27 Mod 2), and Avangard (SS-19 Mod 4 hypersonic glide vehicle).
- Development: Working on Osina, Kedr, and Yars-M ICBMs
- Air and Sea Systems: Modernising air- and sea-based delivery systems and non-strategic nuclear forces.

3. China:

- Modernisation Scope: Significant and rapid expansion and modernisation.
- ICBM Silos: Completed or nearly completed, approximately 350 new silos in northern and east-central China.
- Deployment: Some warheads may now be mated with missiles in peacetime, a shift from previous policy.
- Naval and Air Systems: Refitting Type 094 SSBNs with longer-range missiles, developing a new SSBN class, and a new strategic bomber.

4. UK:

- Modernisation Scope: Ongoing, with future stockpile growth likely.
- SSBNs: Replacing Vanguard-class with Dreadnought-class.
- Missiles: Participating in the US Trident II D5 life extension.
- Warheads: Replacing Mk4A with A21/Mk7 (Astraea), in parallel with US W93/Mk7 programme.

5. France:

- Modernisation Scope: Ongoing, arsenal stable at approximately 290 warheads.
- SSBNs: Developing third-generation SSBN.
- Missiles: Developing a new air-launched cruise missile (ASN4G).
- Upgrades: Refurbishing and upgrading existing systems.

6. India:

- Modernisation Scope: Developing new delivery systems and maturing nuclear triad.
- Triad: Aircraft, land-based missiles, and SSBNs.
- Deployment: Moving towards canisterised missiles and sea-based deterrence patrols, possibly mating some warheads with launchers in peacetime.
- Focus: Emphasising longer-range weapons capable of reaching China.

7. Pakistan:

- Modernisation Scope: Developing new delivery systems, expanding triad.
- Triad: Aircraft, ground-launched ballistic and cruise missiles, sea-launched cruise missiles (SLCMs).

8. North Korea:

- Modernisation Scope: Advancing missile and warhead programmes.
- Missiles: Advancements in manoeuvrability, precision, survivability, and preparedness.

9. Israel:

- Policy: Maintains deliberate ambiguity regarding its arsenal and modernisation activities.

Other developments:

- Dual-capacity missiles, MIRVs, hypersonic missiles, and new sea- or air-based systems are being developed or deployed by several states.
- Transparency and verification: The end of the new START treaty's data-sharing has reduced public insight into US and Russia deployments.
- Dismantlement versus new production: The rate of dismantling retired warheads is slowing and may soon be overtaken by the rate of new warheads entering arsenals.

Appendix 2: Ministry of Defence Budget

Table A–2: Defence Expenditure as a Percentage of Total Central Government Expenditure

Year	Defence Expenditure as a Percentage of Total CGE
2013–2014	17
2014–2015	17
2015–2016	17
2016–2017	18
2017–2018	18
2018–2019	18
2019–2020	18
2020–2021	17.5
2021–2022	14
2022–2023	13
2023–2024	13
2024–2025	13

Source: PRS Legislative Research Calculations (2024).
Note: CGE = central government expenditure.

Table A–3: India's Revenue and Capital Defence Expenditure

Financial Year	Revenue Expenditure (INR crore)	As Percentage of GDP	Capital Expenditure (INR crore)	As Percentage of GDP	Total Expenditure (INR crore)
2013–2014	1,73,912	1.55	80,222	0.71	2,54,134
2014–2015	2,01,929	1.62	83,076	0.67	2,85,005
2015–2016	2,10,306	1.53	83,614	0.61	2,93,920
2016–2017	2,60,067	1.69	91,484	0.59	3,51,551
2017–2018	2,84,273	1.66	95,431	0.56	3,79,704
2018–2019	3,03,657	1.60	99,802	0.53	4,03,3459
2019–2020 RE	3,33,449	1.63	1,15,371	0.56	4,48,820
2020–2021 BE	3,52,823	1.57	1,18,555	0.53	4,71,378

Source: Finance Commission India (n.d.).
Note: GDP = gross domestic product; BE = budget estimate; RE = revised estimate.

Table A–4: Capital Outlay of Defence Services (INR crore)

Financial Year	BEs	Actual
2013–2014	86,741	79,125
2014–2015	94,588	81,887
2015–2016	94,588	79,958
2016–2017	86,340	86,371
2017–2018	86,529	90,445
2018–2019	94,011	95,321
2019–2020 RE	1,03,394	-
2020–2021 BE	1,13,734	-

Source: Finance Commission India (n.d.).
Note: BE = budget estimate; RE = revised estimate.

Table A–5: Ministry of Defence Resource Shortage (INR billion)

	Projection	Allocation	Shortages	Shortages percentage
2015–2016	3,559	3,101	458	13
2016–2017	3,720	3,409	311	8
2017–2018	4,343	3,599	744	17
2018–2019	5,245	4,044	1,201	23
2019–2020	5,352	4,310	1,041	19
2020–2021	5,743	4,714	1,029	18
2021–2022	6,228	4,782	1,446	23
2022–2023	6,333	5,252	1,082	17

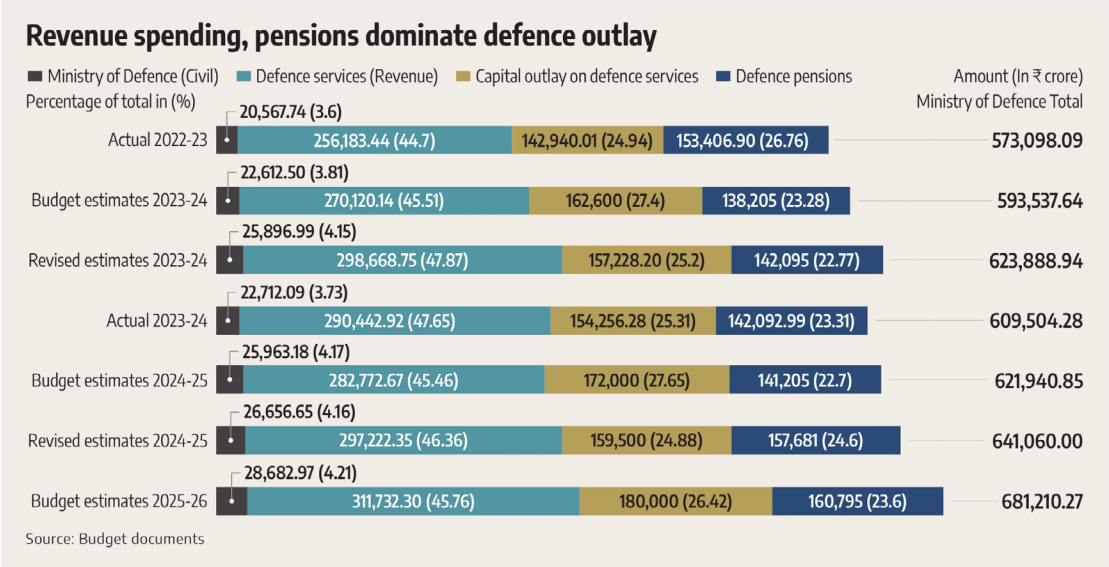
Source: Standing Committee on Defence (2021–2022; 2022).

Table A–6: Shortfall in Capital Acquisition (INR billion)

	Projection	Allocation	Shortfall	Shortfall percentage
Army	347.9	259.1	88.8	26
Navy	626.9	452.5	174.4	28
Air Force	798.6	527.5	271.1	34
Joint Staff	6.2	5	1.2	19
Total	1,779.6	1,244.1	535.5	30

Source: Standing Committee on Defence (2022–2023; 2023).

Figure A–1: Revenue Spending, Pensions Dominate Defence Outlay (INR crore)



Source: Business Standard Blueprint (2026).

Appendix 3: Ministry of Home Affairs: Union Budget 2025–2026

Table A–7: Central Armed Border Police Forces (INR crore)

	BEs 2025–2026		
	Revenue	Capital	Total
BSF	27,590	632	28,231
ITBP	10,228	142	10,370
Assam Rifles	7,922	353	8,274
SSB	10,117	120	10,237

Source: Ministry of Finance (n.d.).
Note: BSF = Border Security Force; ITBP = Indo–Tibetan Border Police; SSB = Sashastra Seema Bal; BE = budget estimate.

Appendix 4: Short extracts from the 15th and 16th Finance Commission Reports on Defence Expenditure

I. 15th Finance Commission:

"In keeping with the terms of reference, the Commission examined the need and urgency to step up outlay on the capital requirements for defence and internal security, identified additional resources and deliberated on the desirability of a separate mechanism for such funding. The Commission examined the capital expenditure projections of the MoD as well as of the Ministry of Home Affairs for internal security. After examining all the aspects, we have recommended the constitution of a dedicated Modernisation Fund for Defence and Internal Security to bridge the gaps between the projected budgetary requirement and budget allocation for capital expenditure on defence and internal security. This will be a non-lapsable fund under the Public Accounts and will have four sources of incremental funding: (i) transfers from the Consolidated Fund of India; (ii) disinvestment proceeds of defence public sector enterprises; (iii) proceeds from monetisation of surplus defence land; and (iv) proceeds of receipts from defence land likely to be transferred to state governments and for public projects in future. The Fund shall have the standard notified rules for its administration, public reporting and audit by the CAG. We also recommend that the MoD should take immediate measures to innovatively bring down the salaries and pension liabilities and reduce its dependence on defence imports, with a specific roadmap."

The Commission examined the need and urgency to step up outlay on the capital requirements for defence and internal security, identified additional resources and deliberated on the desirability of a separate mechanism for such funding.

1. Higher Revenue Expenditure:

"Over the last 10 years, revenue expenditure has grown at 11 per cent and capital expenditure only at 6.1 per cent. The higher growth of revenue expenditure is mainly on account of rising outlays on defence pension, which has increased at the rate of 15.7 per cent.

From 2016–17 onwards, consequent to the implementation of the Seventh Central Pay Commission award and the One Rank One Pension (OROP) scheme for defence services employees, the defence pension expenditure has started growing at a faster rate than the capital outlay on defence services. As the overall resources were limited, this increase in defence pension expenditure impacts the availability of funds for defence modernisation."

2. Shortfall in Allocation

"For the award period 2021–26, the MoD had estimated that, going by current trends, it will receive an allocation of Rs. 9.01 lakh crore for capital outlay and this is based on a growth rate of 16 per cent. However, the defence plan projection on the

capital account is Rs. 17.46 lakh crore for the same period. As a result, the projected shortfall was Rs. 8.45 lakh crore."

3. Ministry of Home Affairs Budget for Internal Security:

"The budget for the Ministry of Home Affairs (MHA) constituted 4.8 per cent of the total expenditure of the Union Government in 2018–19. Of the total budget expenditure of MHA for 201819, 81.7 per cent is on the police, 12.5 per cent is on grants made to Union Territories and 5.8 per cent is on miscellaneous items such as disaster management, rehabilitation of refugees and migrants, census and Cabinet."

Complex procurement procedures and insufficient availability of funds over a prolonged period of time have resulted in shortages in critical defence equipment. The requirement of the armed forces for modernisation can be meaningfully met if there is certainty in the commitment of financial support to it in the form of a dedicated fund, based on approved modernisation plans, at least for a five year-period on a continuing basis.

II. 16th Finance Commission

"On the expenditure side, the submission focuses on defence as the highest priority, especially in view of the critical junction at which India stands. Accordingly, the combined revenue and capital expenditures on defence, border guard and internal security are projected to reach 2.2 per cent of GDP in the final year of the award period.

We recognise the need for growth in defence spending but believe that this expenditure should be aimed at capacity building and modernization on the capital side, rather than on the revenue side.

Accordingly, we have projected defence capital expenditure to grow at a rate of 30 per cent annually. With this level of increase in defence capital expenditure, the total defence expenditure will reach 1.9 per cent of GDP in the final year of the award period, as compared to the current level of 1.4 per cent in the base year."

Appendix 5: Defence Sector Stocks

Table A–8: Indian Defence Sector Stock Prices Rose Sharply Between May 6 and 10, 2025

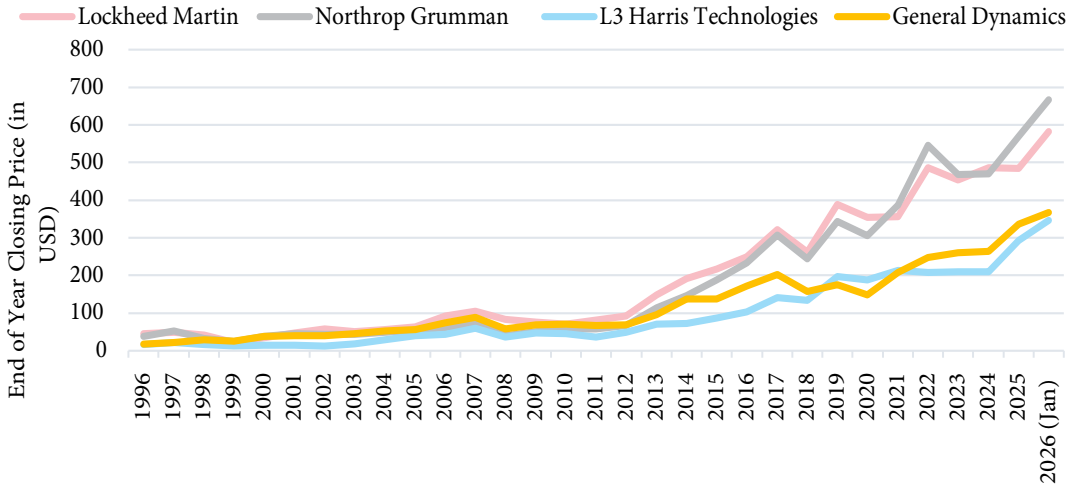
Company Name	May 2 (Before)	May 16 (After)	March 6, 2026
HAL	4484	5128	4024
MDL	3007	3522	2471
BDL	1484	1842	1356
Data Patterns India Ltd	2321	2868	3491
Paras Defence and Space Technologies	676	900	747
Sika Interplant System	682	854	976
Taneja Aerospace and Aviation	284	359	250
High Energy Batteries	479	666	555
ideaForge Technologies	382	561	441
Apollo Micro Systems	117	140	220

Source: Yahoo Finance (n.d.).

Note: HAL = Hindustan Aeronautics Ltd; MDL = Mazagon Dock Shipbuilders Ltd; BDL = Bharat Dynamics Ltd.

Appendix 6: United States Defence Stocks

Figure A–2: United States Defence Stock Prices Over the Years



Source: Yahoo Finance (n.d.).

Appendix 7: Defence Research and Development Organisation Recent Transfer of Technology

Table A–9: Defence Research and Development Organisation Transfer of Technology

S No	Product/Technology	Industry Partner	Description
1	CBRN Recce Vehicles Mk-II	BEL	
2	Mounted Gun System	Bharat Forge Limited	Mobile artillery platform for rapid development
3	Anti-Terrorist Vehicle—Tracked Version	Metaltech Motor Bodies Private Limited	Built for counterinsurgency operations in difficult terrains
4	Full Trailer of 70t Tank Transporter for MBT Arjun Mk-1A	BEML Limited Tata International Vehicle Applications SDR Auto Private Limited John Galt International	For logistics and mobility support
5	Expandable Mobile Shelter	BEL	Designed to provide modular command and control or medical units in field
6	Vajra-Riot Control Vehicle	Tata Advanced Systems Limited	Crowd control in sensitive zones
7	Unit Maintenance Vehicle for MBT Arjun Unit Repair Vehicle for MBT Arjun	BEML Ltd	Essential for field servicing of the MBT Arjun

Source: Press Information Bureau (2025).

Note: CBRN = Chemical, Biological, Radiological, Nuclear; BEL = Bharat Electronics Ltd; MBT = Main Battle Tank; BEML = Bharat Earth Movers Ltd; SDR = .

Appendix 8: Indian Imports of Key Russian Missiles (Defence Security Asia, 2026)

S-400 Triumf: India's long-range air defence system, protecting against aircraft and ballistic missiles, with deliveries ongoing and plans for more missile batches.

BrahMos: A successful JV (India = 50.5%; Russia = 49.5%) for supersonic cruise missiles (land, sea, and air variants) with extended range.

R-37M (RVV-BD): A long-range air-to-air missile offered for joint production under "Make in India," targeting bombers and surveillance aircraft.

Current Developments and Future Prospects

S-500 Prometheus: Russia has offered joint production of this cutting-edge air defence system.

Russia remains a major supplier, focusing on co-development and "Make in India" to reduce reliance on imports and enhance technological sovereignty, according to Defence Security Asia.

About the authors

Jaimini Bhagwati was educated at St. Stephen's College, Tufts University and Massachusetts Institute of Technology (MIT). He was India's High Commissioner to the United Kingdom and India's Ambassador to the European Union, Belgium and Luxembourg. He has held senior positions in the Ministry of External Affairs and the Ministry of Finance, and at the latter, his responsibilities included Indian Capital Markets, Pension Reforms and External Commercial Borrowings. Bhagwati has worked in the World Bank Treasury, Washington DC, and his accountabilities there were related to bond funding, derivatives transactions and asset-liability management. Dr Bhagwati has authored research papers with ICRIER, World Bank, and CSEP, and Penguin published his book "The Promise of India" in August 2019.

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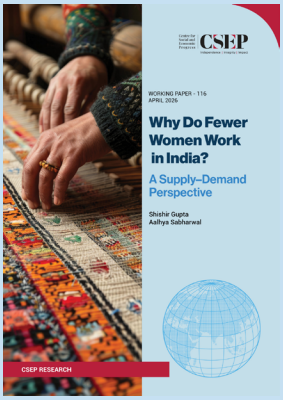
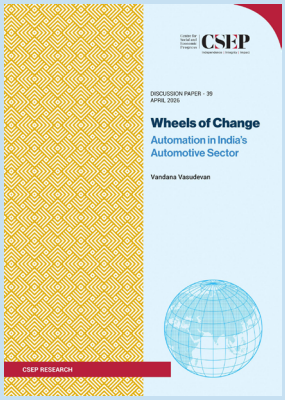
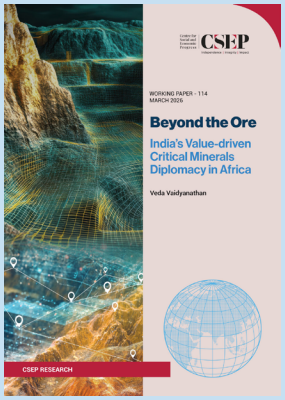
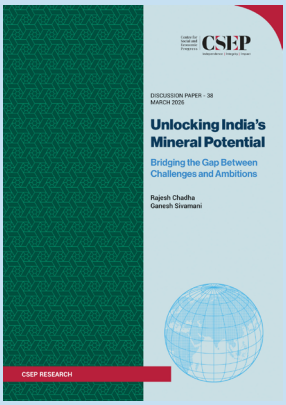
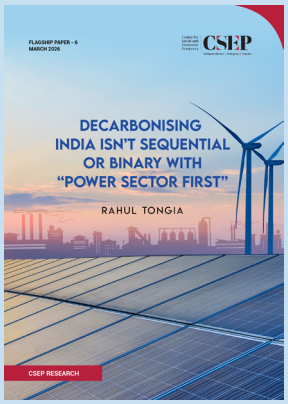
Other publications

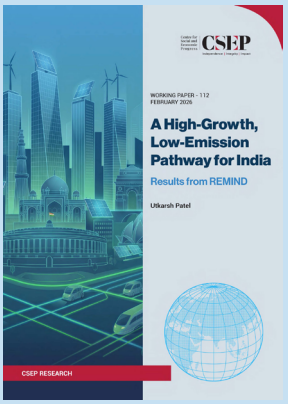


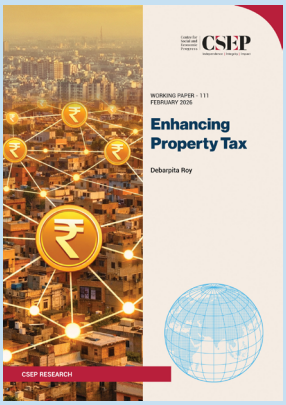


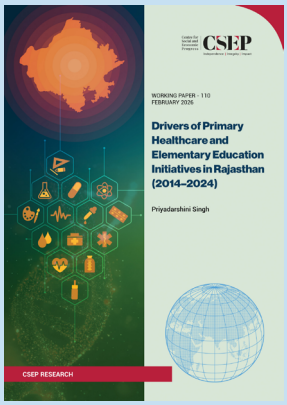


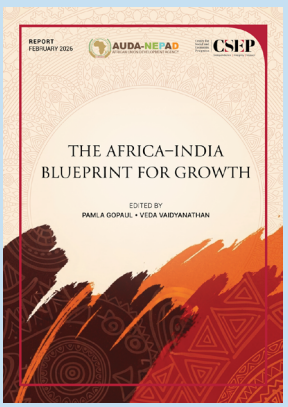


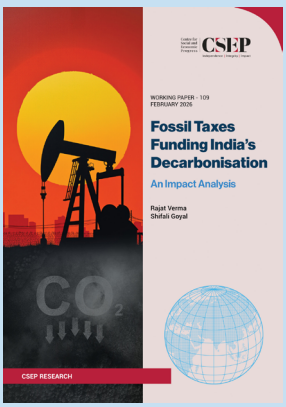


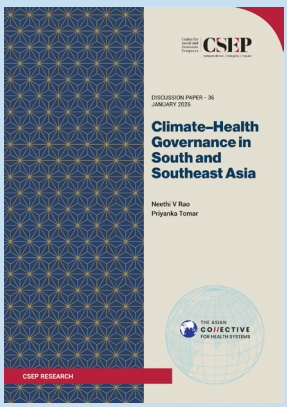












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