Defence Expenditure of India: Efficacy and Effect on Economic Growth

A DISSERTATION SUBMITTED TO THE PUNJAB UNIVERSITY, CHANDIGARH FOR THE AWARD OF MASTER OF PHILOSOPHY IN SOCIAL SCIENCES, IN PARTIAL FULFILMENT OF THE REQUIREMENT FOR THE ADVANCED PROFESSIONAL PROGRAMME IN PUBLIC ADMINISTRATION (APPPA)

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CERTIFICATE

I have the pleasure to certify that Brig Inder Singh Rathore has pursued his research work and prepared the present dissertation titled **"Defence Expenditure of India: Efficacy and Effect on Economic Growth"** under my guidance and supervision. The dissertation is the result of his own research and to the best of my knowledge, no part of it has earlier comprised any other monograph, dissertation, or book. This is being submitted to the Punjab University, Chandigarh, for the purpose of Master's in Philosophy in Social Sciences in partial fulfilment of the requirement for the Advanced Professional Programme in Public Administration of Indian Institute of Public Administration (IIPA), New Delhi.

I recommended that the dissertation of Brig Inder Singh Rathore is worthy of consideration for the award of M.Phil. degree of Punjab University, Chandigarh.

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March 2021 Brig Inder Singh Rathore

NEW DELHI

DISCLAIMER

The findings, interpretations, views, and conclusions in the dissertation are those of the author and should not be attributed in any manner to any authority, organisation or individual.

March 2021 Brig Inder Singh Rathore

Contents

LIST OF ABBREVIATIONS

Ser No	Abbreviation	Full Form
1	AHQ	Army Headquarters
2	AoN	Acceptance of Necessity
3	AWCS	Airborne Warning & Control System
4	BADP	Border Area Development Programme
5	BRO	Border Roads Organisation
6	C3I	Command, Control, Communication & Information
7	C4I2	Command, Control, Communication & Computers, Information & Intelligence
8	CAG	Comptroller & Auditor General
9	CGE	Central Government Expenditure
10	CAPEX	Capital Expenditure
11	CIBMS	Comprehensive Integrated Border Management System
12	CPEC	China Pakistan Economic Corridor
13	Cr	Crore
14	DPP	Defence Procurement Procedure
15	DPSU	Defence Public Sector Undertakings
16	DRDO	Defence Research & Development Organisation
17	DSE	Defence Services Estimate
18	EW Suites	Electronic Warfare Suites
19	FCS	Fire Control System
20	FDI	Foreign Direct Investment
21	FOL	Fuel, Oil & Lubricants
22	FC	Finance Commission
23	FE	Forecast Estimate
24	GDP	Gross Domestic Product
25	GEM	Government e Market
26	HAL	Hindustan Aeronautics Limited
27	HQ IDS	Headquarters Integrated Defence Staff
28	IDEX	Innovation for Defence Excellence
29	IT	Information Technology

Ser No	Abbreviation	Full Form
30	IT	Income Tax
31	LCA	Light Combat Aircraft
32	LRSAM	Long Range Surface to Air Missile
33	MGO	Master General of Ordnance
34	MMRCA	Medium Multi Role Combat Aircraft
35	MT	Military Training
36	MoD	Ministry of Defence
37	MSME	Micro, Small & Medium Enterprise
38	OEM	Original Equipment Manufacturer
39	OFB	Ordinance Factory Board
40	PPP	Public Private Partnership
41	R & D	Research & Development
42	RPA	Remotely Piloted Aircraft
43	SAGW	Surface to Air Guided Weapon
44	SIPRI	Stockholm International Peace Research Institute
45	TIFCS	Thermal Imaging Fire Control System
46	TOT	Transfer of Technology
47	Trg	Training
48	UNPKO	United Nations Peace Keeping Operations

CHAPTER 1

Introduction, Objectives & Research Strategy

'If the military is to show the capabilities that we demand and expect of it, then the defence budget has to continue to rise'.

- Annegret Kramp-Karrenbauer (Minister of Defence, Germany)

Introduction

21st century looks towards security, justice, economic development, and democratic polity as the pillars of nation building. Security comes first in the order because the other three pillars can function effectively only if the security threshold of the nation, both internal and external, remains intact. India has active borders and border disputes with both Eastern & Western neighbours. This is coupled with internal unrest in Kashmir and North East, fuelled by our adversaries. The recent stand-off in Ladakh with China indicated glaring gaps in the defence preparedness. The situation continues to remain volatile with tensions rising every now and then. There is also a need to find a balance between defence expenditure and spending on social sectors, to realise the development aspirations of millions of Indians.

The impact of Defence Services Budget in terms of the plough back effect needs to be analysed against this context. Budgetary allocation for FY 2019-20 would form the framework of the analysis. Defence expenditure needs to be allotted a certain percentage of the Gross Domestic Product (GDP) to meet the modernisation needs of the armed forces. The offset provisions in capital defence procurement can provide a boost to the economy. Defence Medium, Small & Micro Enterprises (MSMEs) can play a major role by collaborating with foreign partners by playing a significant role towards indigenisation and 'Make in India'[1]. The contribution of Services expenditure towards providing a multiplier effect can be analysed by the quantum of Direct Tax contribution and stimulus provided to local economy.

The money that a country allocates to building war capabilities also benefit it in many ways. Resources allocated for defence can spur economic growth and well-being. Indian defence forces have played an important role in constructive nation-building and economic growth, in addition to its primary task of providing national security.

Almost all major inventions and discoveries owe a lot to warfare. If the technology was not invented specifically for war, it was mass-produced for it. Radar, sonar, communication equipment, computers, wireless, missiles, rockets, assembly line production efficiencies, logistics, air transportation and countless other technologies have their origins in defence laboratories and battlefields. Most technologies that were designed for warfare have extensive non-military use. The Internet, nuclear power, space programmes, deep oceanic mapping and transcontinental communications are just some of the examples.

The armed forces give to the community a pool of disciplined, well-trained young men and women. The Indian Army, with at least 13 million troops, discharges some 50,000 trained soldiers back to the hinterland. These men bring with them a national outlook, skills that the army taught them, and the secular world view they have experienced during their stint in the forces. Thousands of ex-servicemen have returned to their native villages and started entrepreneurial ventures leveraging their competencies.

The defence procurement and the offset policy is another area where defence expenditure has contributed to nation-building. The current defence budget for FY 2021-22 has a procurement component of Rs 1,35,061 crore, which will be used to purchase state-of-the-art equipment[2]. The procurement policy lays down the provision of ‘offsets’, which essentially mandates that the seller of the armament has to provision up to 50% of the cost of the weapon platform from Indian manufacturers.

This ensures that a sizeable percentage of money spent on defence procurement is ploughed back into the economy[2]. The following benefits will accrue: -

- In a pursuit to increase the indigenous component of equipment, sellers will need to transfer technology. This will serve to jump-start private sector firms into the defence space, which until now was the domain of government establishments.
- The process of offsetting will lead the seller and his Indian partner down the road into “offshoring". This means the weapon platform could be built at a lower cost enabling it to become globally competitive and establish India as a global defence production and service hub.
- The entry of global firms and defence funds into India will create and rejuvenate an entire ecosystem of tier II and tier III manufacturing firms. This infusion of funds and assured orders will re-energise the manufacturing sector.
- Our defence budget also consists of regular revenue expenditure in the form of salaries, allowances, and sustenance costs of maintaining an army. Rations must be bought, roads have to be built, vehicles need to ply and the agricultural produce of several thousand villages goes in maintaining garrisons stationed all over the country. An entire ecosystem thrives on maintaining and mobilising the defence forces. Cantonment towns are examples of cities which are fuelled by defence establishments that literally created them.

Problem Statement

Modernisation of the defence forces is critical to enable them to play the role effectively in the defence of India's strategic interest. The defence preparedness is often affected as the forces are saddled with obsolete equipment. While the expenditure on defence continues to rise each year, but the defence spending as a percentage of GDP and the Central Government Expenditure (CGE) has been

declining over the years. Many defence analysts including Late Manohar Parrikar have recommended that India needs to spend at least 3% of GDP on defence. However, is this figure adequate to ensure defence preparedness and aspects related to efficacy of defence expenditure needs to be analysed.

High impact dual technologies like Info Technology (IT), aviation, nuclear, space, biotechnology, telecommunications etc have been targeted by the defence services and propel strong economic growth for the country. Almost over 10,000 MSMEs are supported by defence sector and generates huge employment opportunities for a large skilled/ semiskilled work force. The defence MSMEs sector accounts for almost 40% of India's industrial production. Services also generate employment by reskilling the combatants.

A certain proportion of every rupee spent on defence is ploughed back into the Indian economy. Defence spending should improve the strategic and security environment of the country. India's aspiration for a regional power and a key player in global affairs dictate the imperatives of independent, self-reliant indigenous defence capabilities. The 'Make in India' defence initiative aims towards a significant plough back of the defence budget into the economy[3]. Military expenditure while assuring the security of the nation is thus a significant contributor towards growth and stimulus. Defence expenditure cannot be viewed in isolation as a large part of it is used for human resource development.

There is a general belief that the defence expenditure is a burden on the state and without returns. Also, that the entire defence expenditure is being utilised only for maintaining the military. A major part of the Army's budget is also being utilised in developing infrastructure, schools, and hospitals in remote areas of the country. Infrastructure development in border areas boosts revenue for the local economy.

Major projects like border highways, dual use infrastructure like military airfields and Island development projects in Andaman & Nicobar, Lakshadweep are some areas impacted by defence expenditure. This development of infrastructure on our borders helps in connecting the people, who live in remote areas with the mainland. The decision makers need to be sensitised on the multiplier effect provided by defence expenditure (Budget) and positive effect on economic growth.

Objectives

The objectives of the study are: -

(a) To examine the defence expenditure pattern over the last ten years.

(b) To analyse the system of defence budget allotment vis a vis the requirement of the forces.

(c) To recommend measures for earmarking defence budget and effective budget utilisation.

(d) To quantify the amount of defence budget, both revenue and capital which is ploughed back into the economy through taxes.

(e) To examine the impact of defence Exports on economic growth and defence MSMEs on military procurements.

(f) To recommend measures for efficacy of defence expenditure to meet modernisation needs of the forces.

Research Strategy and Design

The research is Exploratory with combination of quantitative/ descriptive and Causal based on secondary data through open sources. Primary data in the form of meetings and questionnaire to representatives from the following organisations/departments: -

- Sections of Ministry of Defence (MoD), Union of India to include the following: -
  - Acquisition Wing: Technical Manager (Land Systems).
  - Directorate General of Financial Planning - Army Headquarters (AHQ).
  - Master General of Ordnance (MGO) Branch.
  - Directorate General of Electronics & Mechanical Engineers.

- Headquarters, Integrated Defence Staff (HQ IDS) : Financial Planning Division.
- Academicians and experts in the field.

Rationale

The defence spending has never been benchmarked to establish how much we need to spend on Defence. The allocation has been ad hoc and enhanced during a crisis and post the crisis, the defence spending follows a normal pattern of meagre spending on capital expenditure. The budget though has been increasing in nominal terms, but many analysts have pointed out that capital expenditure is on the decline and money for new schemes is not available. Some have articulated an expenditure of at least 3% of GDP on defence, to ensure that modernisation needs are met to face the future challenges[4]. The defence spending is higher during periods of security threats and low during periods of calm. There are no established frameworks to decide on the defence expenditure, since security situation is dynamic and defence expenditure impinges upon the precious resources of a nation. It is also considered as non-developmental. Therefore, there is a need to study and analyse how much money should be allocated for modernisation needs of the armed forces.

There is a general feeling in the government that the defence budget expenditure is a drain on the economy and often steps are initiated to generate cuts in the defence budget even after allotment. However, a large quantum of the defence budget gets ploughed back into the economy through direct tax contribution and stimulus provided to local economy.

Almost over 10,000 MSMEs are supported by defence sector and generates huge employment opportunities. Indian arms imports have come down significantly since 2015, indicating that the 'Make in India' initiative is gaining ground. India's defence exports have grown over five times in the last four years, contributing to generation of

foreign exchange. Contribution of the Services towards infrastructure development in border areas cannot always be quantified.

The decision makers therefore need to be sensitised on the multiplier effect provided by defence expenditure (Budget) and the impact it has on the economy. The study would endeavour to identify the percentage of the GDP which the defence budget should be allotted and the amount which gets ploughed back into developing the economy. The defence budget can therefore be categorised as an important engine for economic growth and needs to be viewed through this prism.

(Chapter has been drawn from article on 'How Defence Spending Can Benefit the Economy' by Raghu Raman[2] in addition to the endnotes referred).

CHAPTER 2

Research Questions, Literature Review & Methodology

Many people view defence as a wasteful expenditure that uses precious resources at the cost of development. This guns versus butter debate is age old. Much of this stems from a legacy of over 60 years of treating defence as non-plan expenditure and therefore, viewed as something that does not contribute to national development. Hence, defence planning and expenditures have lacked a long-term strategic orientation and the lack of conviction that it contributes to economic and technological strength, as well as national development. Defence is necessary to ensure a secure nation and is the foremost requirement for all other instruments of governance and development to function. Defence budget, therefore, should have continuity and long-term strategy linked to national development, productivity and growth[5].

Research Questions

The research will attempt to answer the following questions: -

(a) Is there a pattern in allocation of defence expenditure and is it as per the demands of the Services?

(b) What has been the allotment of defence Capital budget towards meeting the modernisation needs?

(c) What percentage of GDP should be allocated for defence expenditure?

(d) What percentage of the total defence budget in terms of tangible amount gets ploughed back into the economy?

(e) What is the contribution of defence Exports and MSMEs in promoting growth for the country's economy?

(f) What is the effect of defence procurement towards economic growth?

(g) What is the effect of border area development and dual-use infrastructure on economic growth?

De-limitations/Limitations

The study will examine the pattern of defence expenditure and different parameters that can be used to benchmark the allocation of defence budget, including allocation by our neighbours/other countries. The study will confine itself to studying the dynamics of defence budget, trends in allocation, different components of defence expenditure and the linkages with GDP.

While there is adequate literature on Defence Budget, but almost all books and available literature focuses on the problems with the defence budget and not on its efficacy. There is limited literature on the multiplier effect of defence expenditure and effect on economic growth. Also, it must be realised that most of the data pertaining to defence budget heads is of sensitive nature. Direct interaction will therefore be carried out with the Ministry of Defence (MoD) Union of India, Finance Planning Directorate at the Army Headquarters, Finance Planning Division of Headquarter IDS and other senior officers associated with the defence budget. Typical limitations would primarily arise in quantifying the following aspects of defence expenditure: -

(a) Intangible deliverables like dual-use infrastructure in terms of airports/airstrip, ports, and Island infrastructure development.

(b) Infrastructure development in border regions, though of high priority for the military, is really a development expenditure that should come from infrastructure departments of the States and the Centre. These could free up significant levels of resources to meet defence expenditure.

(c) Revenue generated through defence exports is also not considered as a major contributor, while developing the defence industrial base for manufacturing through 'Make in India'. This aspect be factored in while making the defence expenditure.

Literature Review

There is plethora of literature available on defence expenditure such as budget documents, detailed account of the government published reports of Ministry of Defence, Audit reports, various publications of Defence institutes such as National Defence College of India, published articles of various defence magazines/ journals such as Jane's defence journal, International Defence Review, Indian Defence Review. In addition, there are many papers and articles published by various defence Research Institutes as well. There are numerous websites which have enormous amount of data on defence expenditure. The following sources provide important literature on defence expenditure: -

(a) Reports of Ministry of Defence, Union of India.

(b) Report of Standing Committee on Defence.

(c) Budget documents of Government of India.

(d) Comptroller and Auditor General (CAG) Audit reports.

(e) The International Defence Publication.

(f) Journals of Jane's Information Group.

(g) Indian Defence Review.

(h) Stockholm International Peace Research Institute (SIPRI) Publications and website.

(j) Asian Strategic Review.

(k) Publications of Institute for Defence Studies and Analysis.

There is a requirement to examine the affordability of India's Defence spending. There is no established or universally accepted framework of evaluating affordability and the relative method of measurement does not consider the economic aspects. The issue needs to be approached by considering different factors but is restricted only to an economic analysis. Defence spending with respect to resource gap, estimates of the

various Finance Commissions, fiscal responsibility of the government, country's national resources expressed in terms of the GDP, total resources available to the government, the priority of resource allocation and financing of Defence expenditure needs examination. All the economic parameters indicate that the allocations for defence over the years have remained affordable, though, in certain cases in a relative sense (Behera, 2008).

Defence expenditure as a percentage of GDP is more useful when comparing it with other expenditures of the government, provided each of those expenditures are assessed in terms of accountability, efficiency, net outcome, and transparency. Using it to compare with the defence budgets of other countries or to say that India has the fifth largest defence budget in the world is meaningless. Defence expenditure must be seen in the context of the nation's security needs and its larger tangible benefits (Matheswaran, 2019).

Given the economic slowdown and shortfall in government's revenue collection, an increase of Rs 40,367 crore in the MoD's overall allocation looks reasonable, though it falls short of the expectations of the defence establishment, which is facing an acute resource constraint to meet all its expenses, including the modernisation. The worry is that the resource constraints are unlikely to be mitigated soon due to the state of economy and socio-economic requirements of the country. Given that a substantial hike in allocation is unlikely to be provided in the near future, the MoD has to find a way out for managing its resource problem, particularly that arise out of ballooning manpower cost, which in turn has crowded out resources that could have been devoted to modernisation and other heads of expenditure (Behera, 2020).

India's rising military expenditure and its improved ranking as the world's third-largest military spender is largely due to a hefty increase in manpower cost. It juxtaposes India's military expenditure with that of other major/relevant military spenders to gauge the pattern of expenditure including in relation to personnel and non-personnel expenditures. While the current resource constraints facing the Indian defence, establishment need to be addressed through an additional increase in allocations, the long-term sustainability of India's military expenditure lies in addressing the bulging manpower cost. Any manpower reform, however, needs to take cognisance of India's unique security requirements and the morale of the armed forces (Behera, 2020).

In present era, to preserve security and sovereignty of the country, it is necessary to spend a significant amount of national income on defence. This study instigates the increasing demand of defence expenditure and to study the growth performance of India with special focus on the efficacy of defence expenditure on economic growth. This study adopts an Autoregressive Distributed Lag and Toda-Yamamoto granger non-causality model during the period 1961 to 2017. Overall, the results suggest that India is affected by both internal and external issues. It verifies that defence expenditure and economic growth are positive and significantly affect each other in both short and long run. It advocates that increment in defence expenditure by 1% in current period will help to boost economic growth by 1.15 % in the long run. For the directional relationship, the Toda-Yamamoto Granger causality outcomes suggest that causality running form DE to GDP which means shows the unidirectional relationship. Accordingly, this designates that defence sector has a crucial efficacy in the development of Indian economy (Sarang, 2019).

In the past ten years, several studies have attempted to analyse the relationship between defence spending and economic growth in less developed countries. The results are neither consistent nor conclusive. Two time series studies have investigated a possible causal relationship between defence spending and economic growth. After pointing out the weaknesses of these studies, re-examining the issue of causality between defence and growth was undertaken. The analysis suggests a feedback relationship for India—a result which does not support the earlier finding of no relationship. The following three favourable factors are being mentioned in the literature [Benoit (1978)], to justify the feedback relationship between defence and growth. First, the military expenditures help to introduce people to modern skills and attitudes. Second, the military's capital expenditures (e.g., roads, bridges, airports) have alternative civilian values and help to strengthen the country's economic infrastructure. Third, defence spending leads to mild inflation, which in turn encourages fuller utilisation of the existing production facilities. Similar effects of defence spending also justify a feedback relationship for India and Pakistan, as obtained in this paper (Tahir 1995).

The relationship between military expenditure and economic growth is complex and need to examine this relationship for India. The study examines and analyses the relationship between military expenditure and economic growth in India, during the period 1980-2016. The study shows absence of causal relationship between military expenditure and economic growth in India, during indicated period. India has been able to build and develop links between civilian and military sectors. The Indian military scientific and manufacturing policies have achieved self-sufficiency in some of its military needs, a strong military industrial base and high levels of military exports. India participated with developed countries in military strategic industries.

Such participation contributed to the integration of civilian and military sectors. India gave rights to private sector and foreign direct investment (FDI) for manufacturing in military industries, giving full marketing rights to the Indian government. These new policies are a great move toward major changes for Indian military manufacturing policy. The findings shed light on the importance of stimulating links between civilian and military sectors, particularly in the industrial sectors and scientific activities. This study contributes to military expenditures and economic effects. Theoretically, this study tries to fill the research gap regarding the impact of military expenditure in Indian case (Gouda Abdel, Mazloum and Zeiny 2019).

It is important to look at the allocation made to both revenue and capital component of defence expenditure. After accounting for inflation of around 4% per year, the real increase in capital expenditure is only 6%. In case of revenue component, it is around 5%. Ideally the modernisation component of defence expenditure for acquiring aircrafts, submarines, tanks, weapon platforms and systems should be around 40% of total defence expenditure, while in India it is around 30%. The other disturbing element is that roughly 60% of defence budget is spent on salary and pension. Services like military farms, huge fleet of military transport and high inventory needs to be trimmed considerably (Misra, 2019).

The extra deployment in eastern Ladakh comes as the Indian Army is heavily committed to protecting the 742 kilometres disputed border with Pakistan, to counter insurgency operations in Jammu & Kashmir and north eastern states and monitoring every ingress point along its border with China. Strengthening border defences comes at a huge cost and puts additional pressure on the nation's military modernisation program. India is the world's third-biggest military spender, its Air Force, Navy, and the Army are still equipped with weapons that are nearing obsolescence. About 60%

of defence spending goes in paying salaries for India's 1.3 million soldiers. Balance amount is spent on past purchases, leaving the forces with obsolete equipment and ammunition shortages. The additional commitment in Ladakh has put further pressure on serviceability, research & development, and capital expenditure, as revenue cost rise. There may be a dire need to increase the defence budget (Behera, 2021).

A plough-back effect in which a large proportion of every rupee spent on the Navy is ploughed back into the Indian economy. The Naval Chief has pointed out that more than 60 % of the Naval budget is dedicated to Capital expenditure and nearly 70 % of this Capital budget has been spent on indigenous sourcing, amounting to nearly Rs 66,000 crore in the last five years. 80 % Acceptance of Necessity (AoN) on cost basis have been awarded to Indian vendors since the launch of 'Make in India' in 2014. Of the total 51 Ships and Submarines on order at various shipyards as on date, 49 are being constructed indigenously. This highlights the considerable levels of plough-back into the economy (Shankar, 2020).

Methods Applied & Data Sources

- Exploratory, Quantitative/ Descriptive and Causal
  - A customised Questionnaire would be floated to the various persons/ representatives as given out in Research Strategy & Design above
  - Relevant secondary sources including books and articles in the national journals.
  - Relevant content analysis of reporting in leading newspapers published during the period under study.
  - Analysis of scholarly articles/ studies published that could have an important or direct bearing on the study.
  - One to one interactions/ meetings would be undertaken. Consolidated details of responses received/ interactions made would be tabulated and analysed.

CHAPTER 3

Trends, GDP Linkage, Issues - Revenue, Capital Expenditure & Questionnaire

Defence spending is neither based on threat perception nor has followed a plan. The growth of the defence forces has not been based on capability building but has always been episodic and post crisis. The first expansion and defence spending of Indian Army took place post 1962. The world over the trends has been naturally to increase the defence spending during the times of national emergencies such as wars.

Defence Spending by US & UK During Wars. In case of UK in 1947 in the aftermath of world War II, defence spending was 16 percent of GDP, but declined to 6 percent of GDP by 1950. However, during the Korean War, the defence spending increased to 11.2 percent GDP in 1952[6]. Thereafter it declined through the rest of the 1950s to 7 percent GDP by 1959. In the 1960s defence spending declined slowly, dropping through 7 percent GDP in 1963 and then holding steady until defence budget cuts at the end of the 1960 reduced defence spending to 5.4 percent GDP in 1970. Defence spending was steady at 5.4-5.5 percent GDP in the 1970s, peaking at 5.95 percent GDP in 1982 during the Falklands War. Thereafter, defence spending declined to 5.3 percent GDP in the mid-1980s, and dropped through 5 percent in 1987, before stabilising at 4 percent of GDP in the early 1990s[7]. In the mid-1990s defence spending was cut, declining to 3 percent GDP in 1997, and continuing a decline to 2.63 percent GDP in 2003. In the mid-2000s, defence spending increased to 2.6-2.7 percent GDP, but since the great recession defence spending has declined to about 2.4-2.5 percent GDP. Post 9/11 there was a surge in defence spending, in 2000 UK defence spending was £28 billion but rose to £45 billion in 2011[7]. The defence budget has remained more or so on the same level at £44-45 billion per year. In terms to Gross Domestic Product, UK defence spending was 2.85 percent of GDP in 2000.

However since then from 2002 to 2009, defence spending has been constant at about 2.65-2.70 percent GDP and going below 2.4 percent GDP in 2016 and £45.4 billion for the year 2017-18[7].

The United States devoted an average of 37.4 percent of GDP to defence during World War II (FY1943-45), 14.2 percent at the peak of Korean War (FY1953), 9.5 percent during the peak of Vietnam War (FY1968), and as high as 6.2 percent during the 1980s Regan Era build up (FY1986)[8].

Capital Outlay- Continuity & Strategy

The major problem lies in capital expenditure allocation which this year is barely 34 % of the overall budget, while revenue expenditure is a high 66 %. Over the last ten years, capital outlay has consistently reduced from about 45 % to 34 %. Even if the miscellaneous expenses of the Ministry of Defence (MoD) are deducted, the effective capital outlay comes down to around 25 percent. The committed liabilities have increased from 60 % to 92 %, thus leaving barely eight % for new procurements. Similarly, the shortfall in projected requirements has shot up from 11 % in 2011 to 36 % last year. Fundamentally, India's procurement policies are crisis managed. When we finally do make the decision for procurement, it is at higher costs, besides the penalty of operational costs and opportunities lost. Indigenous manufacture has rarely moved beyond the licensed-production model. As a result, there are many occasions when the huge infrastructure of the Defence Public Sector Undertakings (DPSU) lies idle, because we have not succeeded in putting in place a strategic continuity plan for defence industry beyond the licensed-production model. Production efficiencies are low and there are serious issues of lack of accountability resulting in the capital outlay being spent largely on imports. There has been a cascading effect of postponing or delaying most procurements due to the huge costs involved. The only way this can be

addressed is a combined strategy of higher expenditure of not less than three % of GDP on defence and match it with a focussed strategy of indigenisation.

Defence Budget as Percentage of GDP. India's defence budget as percentage of GDP based on Stockholm International Peace Research Institute (SIPRI) Yearbook: Armaments, Disarmament & International Security is depicted below:

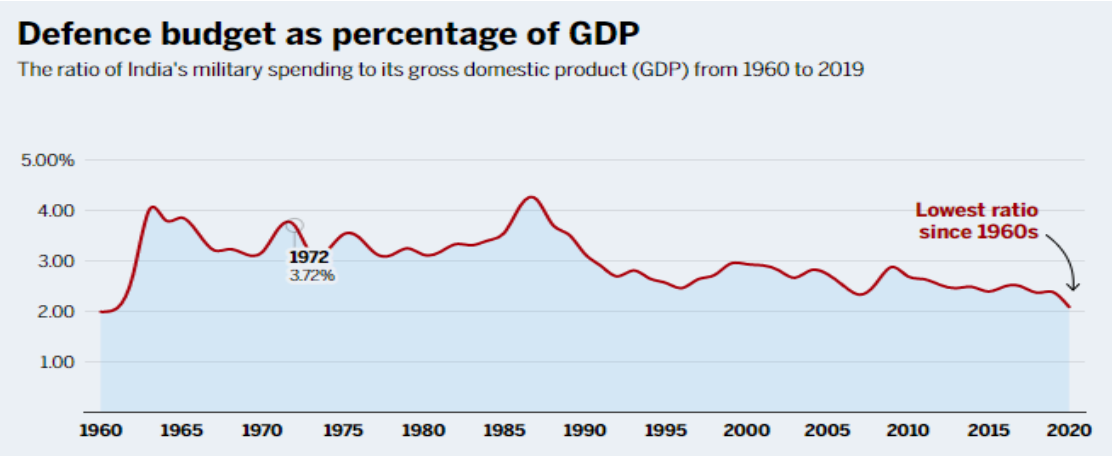


Chart - 3.1: Defence Budget - Percentage of GDP
(Source: SIPRI Year Book – Armaments & International Security)

India's Ratio of Military Spending to Gross Domestic Product (GDP)[9]

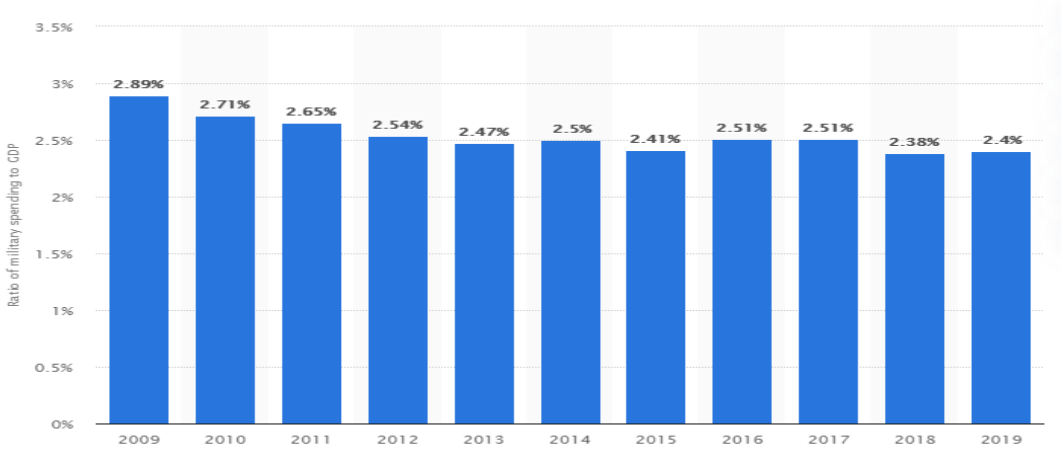


Chart - 3.2 Military Spending to GDP
(Source**:** Ratio of Military Expenditure to GDP in India 2009-2019 by H. Plecher)

Resource Projection & Allocation. In the given economic situation, the growth of 9.4 % in MoD's overall allocation looks reasonable, but not sufficient to meet all the shortages. MoD's gap between resource requirement and allocation, narrowed

from a high of 27 % in 2013-14 to 14 % in 2015-16, has increased to 30 % in 2018-19 and 25 % in 2019-20 (Chart 3.3)[10]. The MoD must cut down some of its planned expenditure and reprioritise the rest.

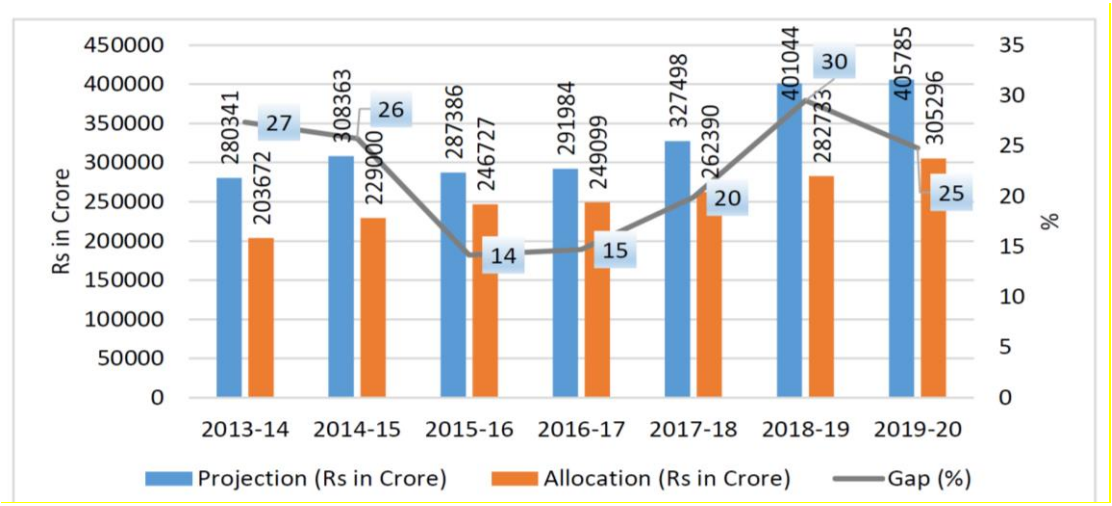


Chart - 3.3: Resource Projection & Allocation - Defence Services Estimates
(Source: IDSA, India's Defence Budget 2020-21 by LK Behra)

Defence Budget as Percentage of GDP & CGE. There is a steady decline over the years of Defence Services Estimates (DSE). Implication is that increase in Defence Budget has not kept pace with increase in GDP[11]. While in absolute terms, there is a marginal increase, this marginal increase is not commensurate to the overall increase in GDP or CGE. This is also inadequate for modernisation.

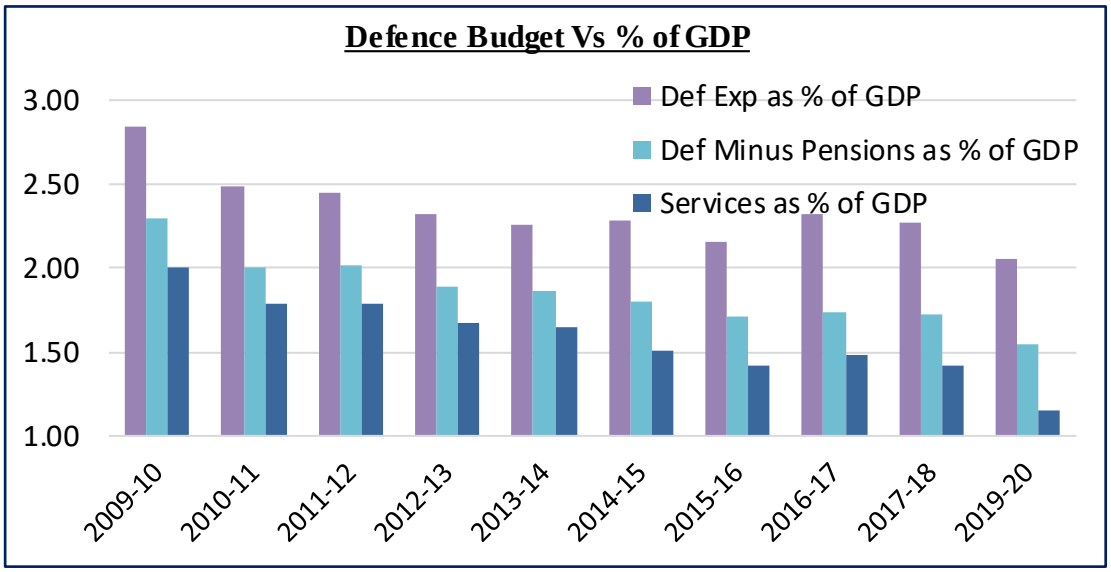


Chart - 3.4: Trend Analysis of Defence Budget and GDP
(Source: IDSA Data)

MoD's Budget: Defence, Civil & Pension

Among the three major components of the MoD's 2020-21 budget, the DSE constitutes 69%, defence pension 28% and MoD (Civil) 3% (Table 3.1). It is however, to be noted that in the three years since 2018-19, the share of DSE, which deals with operating expenses and capital needs of the defence services, has seen a decline, while that of the defence pension has increased. Furthermore, the increase in the defence pension accounts for nearly 54% (Rs 21,745 crore) of the total growth in the defence budget. Together with increase in the pay and allowances (P&A) of the three-armed forces, its contribution to the overall growth of the MoD's budget amounts to a whopping 78% (Rs. 31,483 crore). In comparison, modernisation budget has contributed to about 23% of the growth. This means MoD's all other segments combined has witnessed a negative growth, though marginally.

Year	Defence Services	MoD (Civil)	Pension	Total
2018-19	290802 (72)	10881 (3)	101775 (25)	403457
2019-20 (BE)	305296 (71)	13635(3)	112080 26)	431011
2019-20 (RE)	316296 (70)	14714 (3)	117810 (26)	448820
2020-21 (BE)	323053 (69)	14500 (3)	133825 (28)	471378

*All figures are in Crores

Table 3.1: MoD's Budget: Defence, Civil and Pension

(Source: IDSA, India's Defence Budget 2020-21 by LK Behra)

Note: Figures in parenthesis represent percentage share in MoD's total expenditure. MoD (Civil) includes MoD Secretariat, Border Roads Organisation, Defence Accounts Department, Coast Guard Organisation, Defence Estate Organisation, Jammu and Kashmir Light Infantry, Armed Forces Tribunal, etc. BE and RE represent Budget Estimate and Revised Estimate, respectively.

Manpower Cost

The under provision of the modernisation budget needs to be seen in the larger context of the MoD's changing pattern of expenditure. The share of manpower cost (salary, pension and other heads) in the MoD's expenditure has drastically increased to account for almost 60 %. More significantly almost all the increases in the manpower cost have come at the cost of the stores and modernisation budget, two key components of the DSE that are essential for acquiring/ maintaining hard military capability. In other words, the modernisation expenditure has suffered due to the sharp increase in manpower cost.

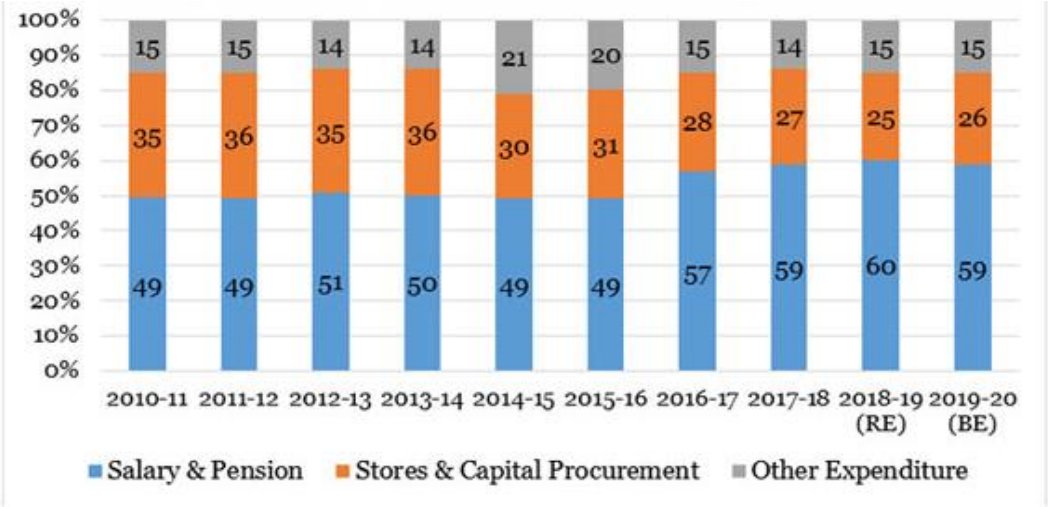


Chart - 3.5 : Pattern of MoD Expenditure

(Source: IDSA, India's Defence Budget 2020-21 by LK Behra)

The hefty increase in the manpower cost is primarily due to the ever-increasing number of people being funded by the MoD and their periodic increase in salary, pension, and other benefits. Presently, MoD's budget directly pays nearly 5.1 million people, of which 1.4 million are uniformed personnel, 3.2 million pensioners and 3,98,433 defence civilians. In percentage terms, defence pensioners constitute 64 % of total MoD-funded personnel. The Personnel Below Officer Rank (PBOR), the biggest pensioner segment, accounts for 77% of the

total pensioners and 49% of total number of people directed funded through the MoD's budget. Last year, the government's allocation to the defence ministry was the highest among all ministries at 15.5% of the total budget expenditure.

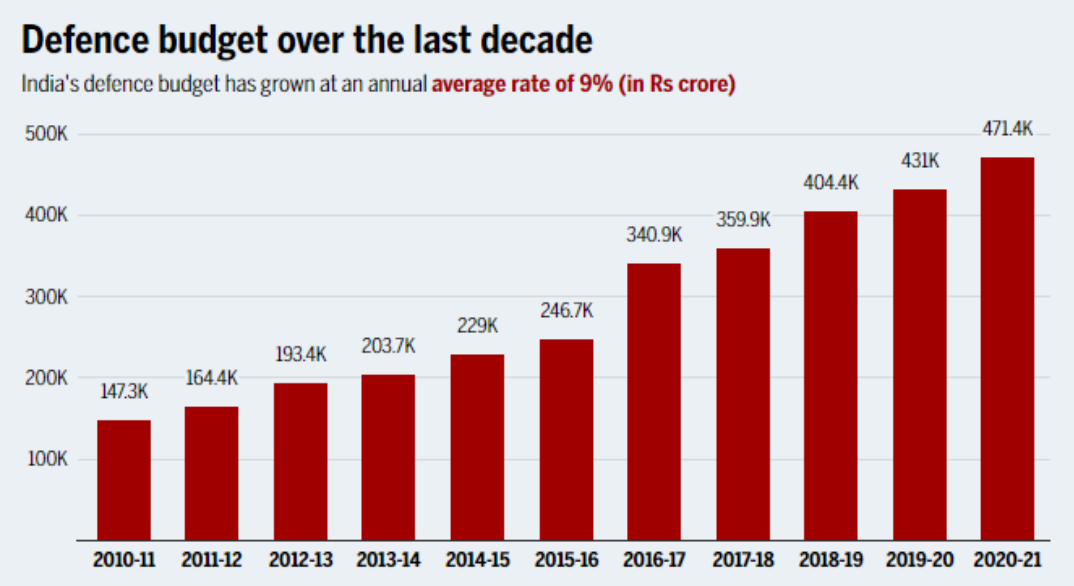


Chart - 3.6

(Source: Times of India- India's Defence Spending)

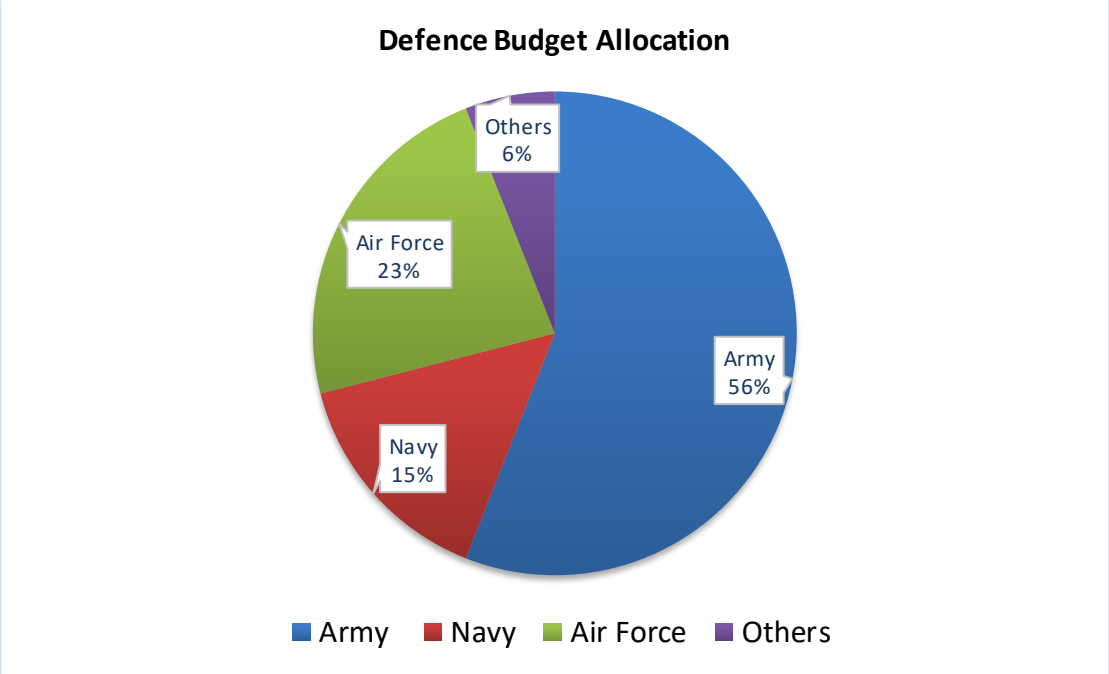


Chart - 3.7

(Source: IDSA, India's Defence Budget 2020-21 by LK Behra)

Expenditure	Army	Navy	Air Force
Revenue	146941 (82%)	22935 (46%)	29963 (41%)
Capital	32474 (18%)	26688 (54%)	43282 (59%)
Total	179415	49623	73245

Table 3.2 : Capital & Revenue Expenditure of Services:2020-21

(Source: Times of India- India's Defence Spending)

Army has the lowest capital share of the budget. In absolute terms, our Defence budget has consistently increased[12]. It has increased from 3,000 cr in 1980 to 2.8 lakh cr till 2019. The allotment for year 2021-22 is 4.78 lakh cr and with exclusions of pensions, it stands at 3.62 lakh cr. Over 40-year period, it has grown at ~12% Compound Annual Growth Rate (CAGR), with growth rates slowing down off lately.

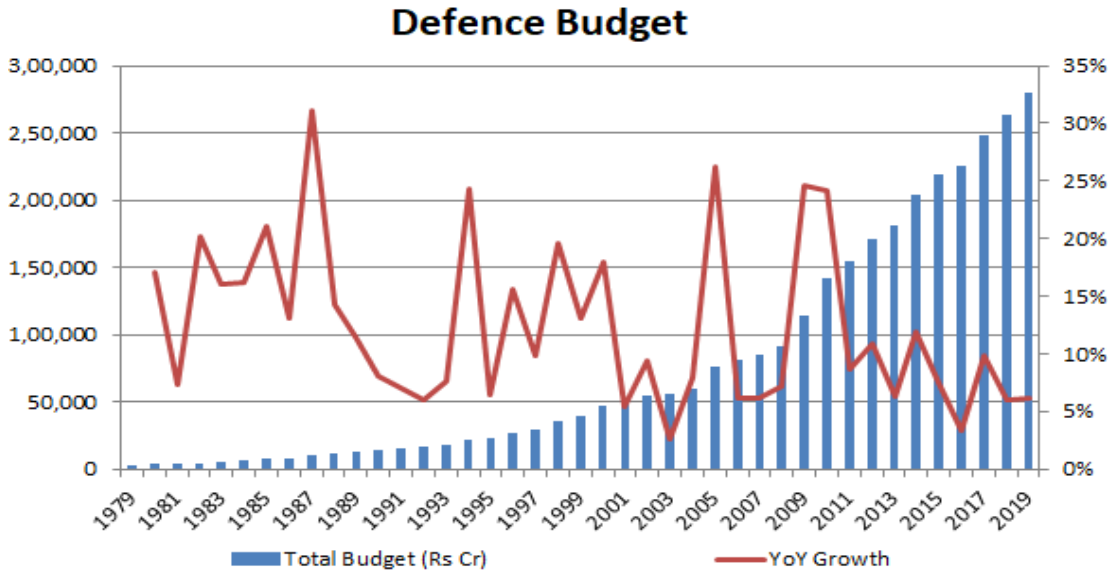


Chart - 3.8

(Source: Overview Capital Expenditure & Spending Patterns By Keval Shah)

<u>Defence Industry's Budget Breakup</u>. The budget is divided into Revenue & Capital expenditure. Revenue expenditure comprises of pay & allowances, spares for vehicles/equipment etc and Capital expenditure comprises procurement of arms and

equipment. The share of Capital Expenditure has increased from 9% of defence expenses in 1980 to 33% currently, with major growth occurring in 1980s & 2000s[13].

Defence Budget Breakup	1979	1989	1999	2009	2019
Revenue Expenditure	91%	72%	75%	64%	66%
Capital Expenditure	9%	28%	25%	36%	34%

Table 3.3: Summary -Defence Budget Breakup (1979-2019)

(Source: Overview Defence Expenditure & Spending – IDSA)

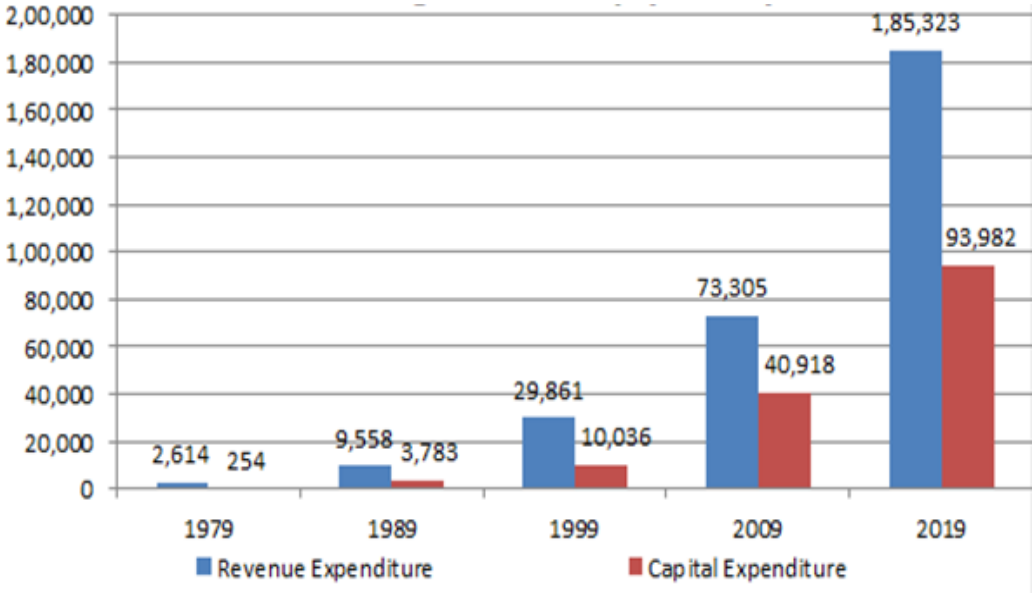
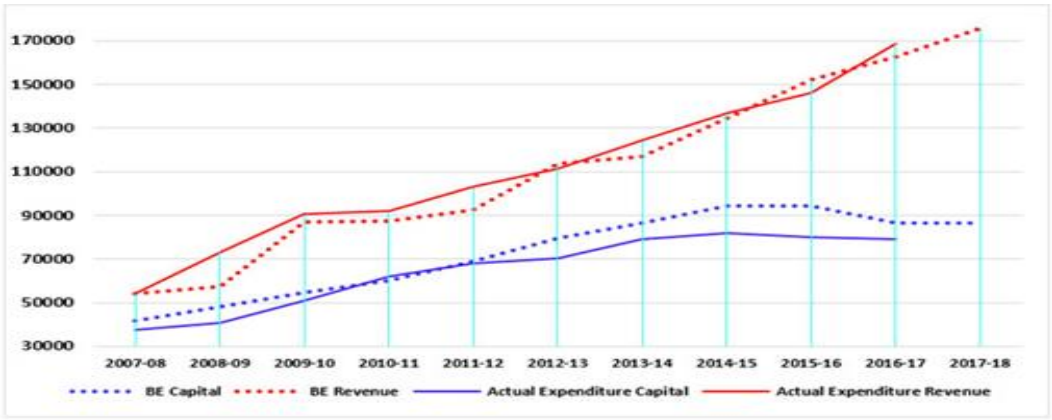


Chart 3.9 : Budget Breakup Revenue & Capital Expenditure

(Source**:** Overview Capital Expenditure & Spending Patterns By Keval Shah)

Capital Expenditure

The lower Capex spending can also be seen with Actual spending consistently being lower than the Budgeted spending, as can be seen in the below chart (blue line).



Source: Union budget document and DSE Vol I

Chart – 3.10
(Source: Union Budget Document & DSE Vol)

A further breakup of the above chart shows the lower modernisation and capex spend compared to the Budget Estimates in our Army, Navy and Air Force.

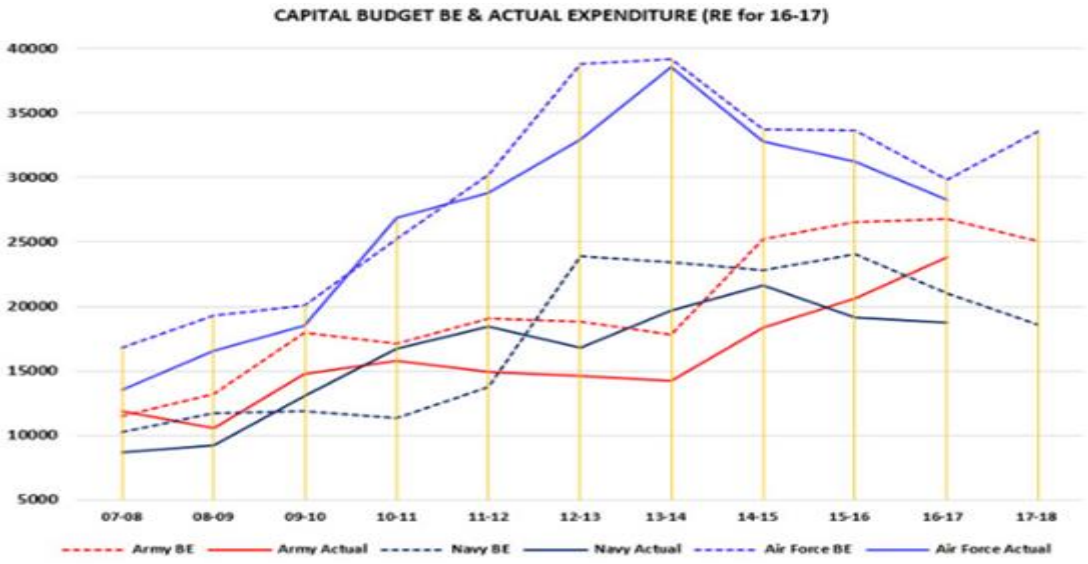


Chart – 3.11
(Source – IDSA: Indian Defence Industry by LK Behera)

Defence Budget & Capital Outlay: 2021-22

The overall defence budget for 2021-22 was hiked marginally by around 1.4 percent, but there was a nearly 19 percent rise in capital outlay for military modernisation. An additional unbudgeted Rs 20,776 crore was also spent to buy military hardware in the

face of the Ladakh border standoff with China. According to the 2021-22 budget, the allocation for the Defence Services was increased to Rs 4.78 lakh crore compared to Rs 4.71 lakh crore in the 2020-21 budget.

The budget has set the highest ever capital expenditure target by underling funds for capex. It is 19 % increase in Defence capital expenditure compared to last year's allocation of Rs 1,13,734 crore. This is highest ever increase in capital outlay for defence in 15 years. A total of Rs 1,35,060 crore has been set aside for capital expenditure that includes purchase of new weapons, aircraft, warships and other military hardware.

Methodology. Budgetary allocation for FY 19-20 will form the framework of the study with each budget head of Army, Navy and Air Force being examined for the quantum of money being ploughed back for growth. Budget allocations (both Capital & Revenue) have been categorised under the following heads for examination: -

(a) **Direct Contribution**. Remittances to the Consolidated Fund of India (CFI) towards payment of direct and non-direct taxes, infrastructure developed in border areas, skill development, technology transfer, defence exports and education have been aggregated as direct contribution towards nation building.

(b) **Stimulus - Local Economy**. Services have a pan India footprint and contribute significantly to the local economy in terms of local procurement, hiring of local transport and labour. This amount stimulates the local economy and provides livelihood for many people.

(c) **Cost - National Security**. Remainder defence budget is essentially the cost of national security borne by the nation.

Quantification Schema

Revenue Budget. Services, OFB and DRDO's Revenue budget is meant primarily for Force Sustenance and drives the local economy across the entire country in a variety of ways. Revenue budget heads of the Services, OFB and DRDO have been examined in the following context and the total contribution to economy quantified: -

(a) **Revenue Budget: IT Salary Component**. Services have a total of 66,051 Officers, 13,72, 666 JCOs and Other Ranks. While 30% officers pay Income Tax (IT) in 30% bracket, the remainder 70% pay IT in 20% bracket. 70% of Personnel Below Officer Rank pay IT in 10% bracket, while the rest 30% pay is below the IT tax bracket. Normalising the tax contribution for officers, it has been aggregated to 23 % of budget head. Applying a similar framework for Personnel Below Officer Rank, the tax contribution is aggregated to 7% of budget head. For civilians paid from Defence Estimates, normalised value of 8% of budget head is assumed, considering 5% of civilians as gazetted.

(b) **Revenue Budget: Types of Taxes Levied**. Non salary component of the Revenue budget needs to be analysed for various types of indirect taxes which are paid to the exchequers of the Central & State Governments. Indirect taxes and their quantum mapped to each line item of the non-salary component of the Revenue Budget is summarised at Appendix 'A'.

(c) **Indirect Contribution to National Economy**. Services provide stimulus to the national economy in terms of local procurement, hiring of local transport and labour. Contribution to local economy have been quantified as a percentage of expenditure from public and non-public funds. While 30% of wages have been factored as stimulus into local economy, quantum of funds being ploughed back into

the national exchequer and local economy is quantified after examining the revenue budgets of the three Services as per percentages quantified in Appendix 'B'.

Capital Budget Allotment. The direct contribution from taxes has been quantified at 12.5% of the committed liabilities. For indigenous procurements and the OFB services order book, 40% flow to the indigenous MSME ecosystem is considered.

Modernisation Budget for Services. Table 3.4 summarises service wise modernisation budget in respect of budget and revised estimates of 2019-20 and budget estimate of 2020-21. All three services have got a hike in their 2020-21 modernisation budget, with the overall increase being 11% or Rs 9,227 crore. However, in comparison to the revised budget of 2019-20, the increase is a mere Rs 255 crore[14]. The meagre increase vis-à-vis revised allocation looks grossly under-provisioned, due to the vast shortages existing in capital procurement.

Services	2019-20 (BE) (Cr)	2019-20 (RE) (Cr)	2020-21 (BE) (Cr)	% Increase in 2020-21 (BE) Over 2019-20 (BE)
Army	22,951	23,517	25,999	13.3
Navy	22,106	25,155	25,620	15.9
Air Force	36,365	41,722	39,031	7.3
Total	81,422	90,394	90,649	11.3

Table 3.4: Defence Service Estimates

(Source – IDSA : Indian Defence Industry by Laxman Kumar Behera)

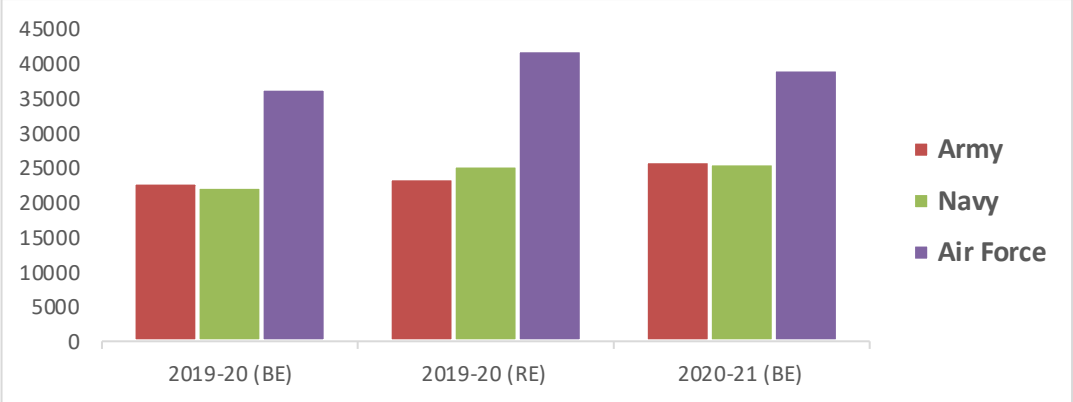


Chart 3.12 : Services Modernisation Budget - 2019-2021

(Source – IDSA: Indian Defence Industry by Laxman Kumar Behera)

Budget Shortfall for Modernisation. Armed forces are amid a major modernisation drive. In the first 10 months of 2019-20, the MoD had signed nearly 14 new contracts that include T-90 Tanks (Rs. 20,000 crore), anti-submarine warfare shallow watercraft (Rs 12,623 crore) and Akash Missile System (Rs. 5,357 crore). However, owing to severe resource crunch, allocation for modernisation has been less than even the Committed Liabilities arising from payment outgo for the past contracts (refer Table 3.5).

FY	Committed Liabilities (Cr)	Modernisation Budget (Cr)	Shortages (Cr)	Shortages (%)
2016-17	73,553	62,619	10,934	15
2017-18	91,382	68,965	22,417	25
2018-19	1,10,044	73,883	36,161	33
2019-20	1,13,667	80,959	32,708	29

Table 3.5: Shortages of Modernisation Fund

Capability Development. From 2014 onwards, a total of 239 schemes costing approximately Rs 1,76,490 Cr have been contracted. Discrete capabilities accrued by the Services and the capability gaps of each Service are also tabulated below. It is the

capability building in these vital areas of national security which are impacted by budget shortages[15].

Army	Navy	Air Force
Armoured Fighting Vehicles	Integral air assets for Air Support warfare missions	Heavy Lift Aircraft
ISR platforms like UAVs, Radars Strategic, Operational & Tactical	Conventional submarine fleet	Attack Helicopters
Network Centric Warfare capabilities(C4I2, Tac C3I systems)	MCM coastal defence capabilities	Fighter fleet (LCA, MMRCA)
Tactical airlift capability with Recce & Observation fleet	Destroyers & Frigates	AWACS & EW Suites
	Infrastructure Shore Support	RPAs & SAGW
		S- 400/LR SAMs

Table 3.6: Capability Voids Impacted by Insufficient Funds

Summary. Examination of the defence budget vis a vis the GDP, CGE and other metrics bring out the following aspects: -

- Inadequate budgetary allocations with respect to planned projections (amplified in Chart 3.3 - Resource Projection & Allocation).
- Capital budget is barely sufficient to meet Committed Liabilities leaving insufficient funds for modernisation (amplified in Table 3.5).
- Stabilisation of pensions and Revenue budget has occurred, there will now be greater fiscal space for capital component of the budget.
- Exemptions from Customs duty of direct imports by MoD has been withdrawn in Finance Bill 2016-17. Additional levies on defence imports will be Basic Customs Duty (5 to 10 %), Countervailing Duty of 12.5% and Special Additional Duty of 4% (a total increase of approx. 18.5% to 29.74%).
- GST promulgation has increased tax on defence related items being repaired/overhauled by DPSUs and OFB to 18% or an increase of 6%.
- Introducing a 15% year on year increase in the capital component would propel growth and meet the modernisation needs of the Services.

It becomes imperative to examine the defence budget and quantify the elements which trickle back to the national economy. Ibid analysis is important to highlight that the recent initiatives towards indigenisation and the emergence of a nascent military industrial complex has greatly increased the positive correlation between defence expenditure and its multiplier effect on the national economy.

Analysis: Revenue Budget. Revenue budget of Services, OFB & DRDO will be explored with respect to DSE for FY 19-20. Grants No 19, 20 & 21 of Defence Services - Revenue will be examined.

(a) **Direct Tax Contribution**. Income tax paid by combatants and defence civilians paid from defence estimates has been quantified as per paragraph above.

(b) **Indirect Taxes**. Various types of indirect taxes paid to the exchequers of the Central & State Governments have been quantified as per paragraph above.

(c) **Stimulus to Economy**. While 30% of wages have been factored as stimulus into local economy, quantum of funds being ploughed back into the exchequer and economy is quantified below after examining revenue budgets of three Services (as quantified under Revenue budget- Indirect Contribution on National Economy above).

Type of Contribution	Army	Navy	IAF	Total
Direct Taxes (Income Tax)	8.96	0.32	1.52	10.80
Indirect Taxes	103.76	1.69	4.64	110.09
Indirect Stimulus to National Economy	24.27	1.96	2.30	28.53
Total Contribution of DSE to National Economy * All figures in Crores				149.43 (48.84%)

Table 3.7 : Contribution of Services

(Source: Aggregated from data as attached in Appendices)

Type of Contribution	Army	Navy	IAF	Total
Direct Taxes (IT)	8.96	0.32	1.52	10.80
Indirect Taxes	103.76	1.69	4.64	110.09
Indirect Stimulus to National Economy	24.27	1.96	2.30	28.53
Total Contribution - Revenue Budget of Ordnance Factory Board				4.83
Total Contribution from Revenue Budget of DRDO				4.15
Total Contribution of DSE to National Economy				158.36
* All figures in Crores				**(48.84%)**

Table 3.8: Summary of DSE Contribution to National Economy

(Source : Aggregated from data as attached in Appendices)

S No	Topic	Appendices
(a)	Revenue Budget	C (Army), G (Navy) M (Air Force)
(b)	Direct Taxes (Income Tax)	D (Army), H & J (Navy), N (Air Force)
(c)	Indirect Taxes	E (Army), K (Navy), O (Air Force)
(d)	Indirect Stimulus to National Economy	F (Army), L (Navy), P (Air Force)
(e)	Ordnance Factory Board Revenue Budget	Q
(f)	OFB Direct Tax Contribution	R
(g)	OFB Indirect Contribution	S
(h)	DRDO Revenue Budget	T
(j)	DRDO Direct Tax Contribution	U
(k)	DRDO Indirect Contribution	V
(l)	Capital Budget: Contribution of Services Capital Budget to National Economy	W

Table 3.9: List of Appendices Containing Budget Data

Supply Chain Management. Army, Navy & Air Force have complex and large requirement of civilian transport to augment service transport. This civilian transport requirement is outsourced from the private sector and provides significant stimulus to the unorganised transport sector.

S No	Service	Supply Chain Budget (Amount in Cr)
(a)	Army	4193.33
(b)	Navy	93.79
(c)	Air Force	1169.91
Total		5457.03

Table 3.10 : Supply Chain Budget for the Services

(Source: Data as per Appendix)

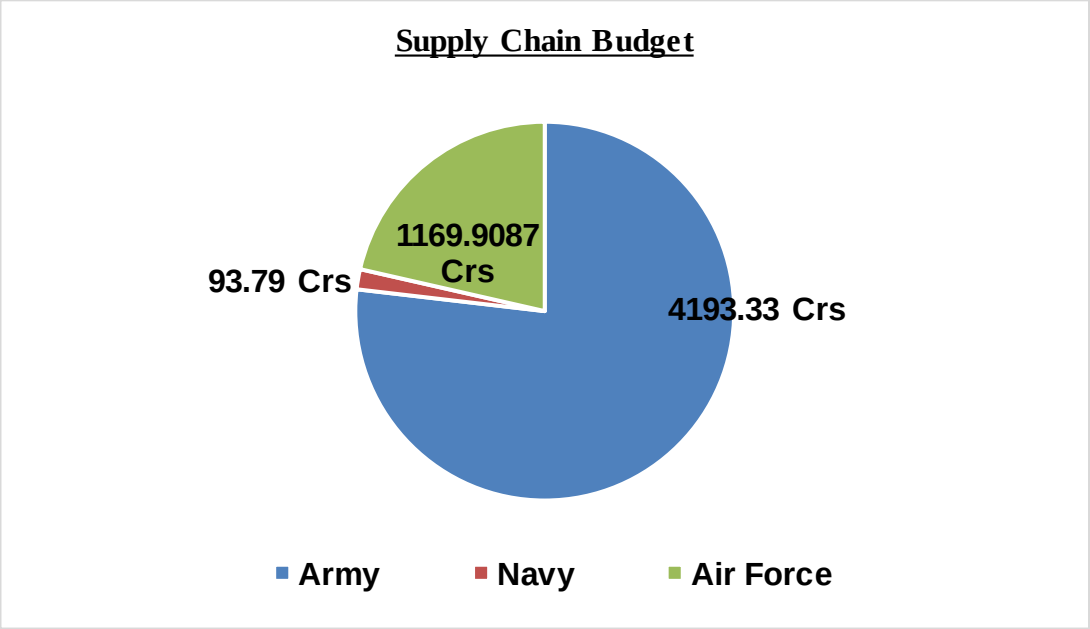


Chart 3.13 : Supply Chain Budget for the Services

(Source : Chart prepared from data as per Appendix)

FOL Budget. Army, Navy & Air Force have a considerable requirement of Fuel, Oil & Lubricants (FOL) to prosecute war and for national security. These FOL

requirements are paid for from defence estimates. In addition, the Services provide Air Defence protection to strategic energy assets from external & sub conventional threats.

S No	Service	FOL Budget (Amount in Crs)
(a)	Army	2038.146
(b)	Navy	122.29
(c)	Air Force	40.77
Total		**3366.86**

Table 3.10 : Supply Chain Budget for the Services

(Source: Chart prepared from data as per Appendix)

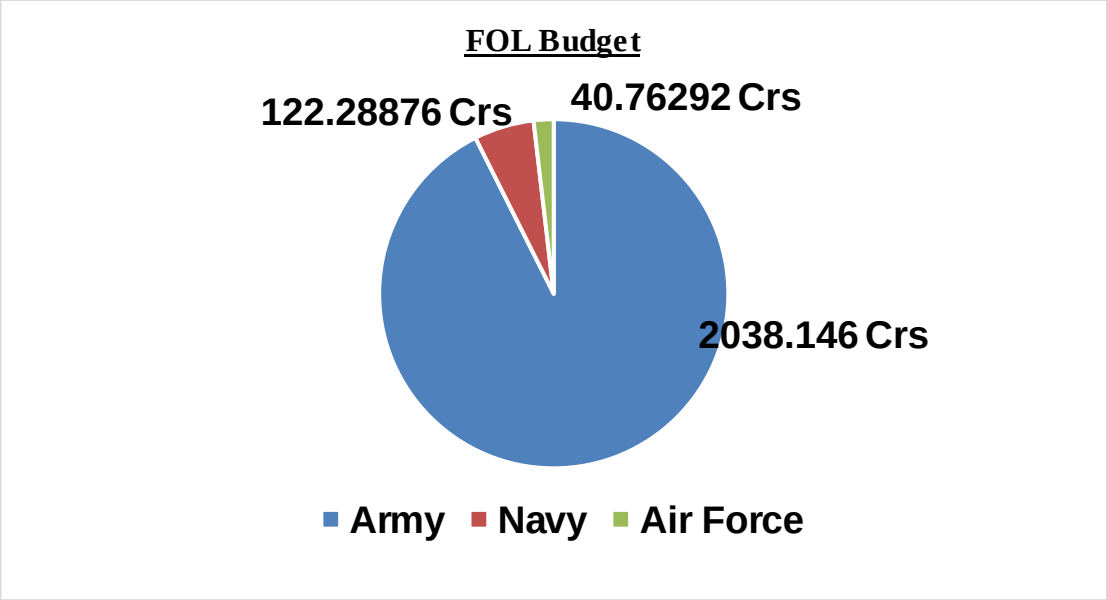


Chart 3.14 : FOL Budget

(Source: Chart prepared from data as per Appendix)

Capital Budget: Contribution to Economy

Contribution of the Services towards nation building has been quantified through two heads. Direct contribution towards indirect taxes paid out of DSE has been quantified in terms of the tax rates aggregated. Services contribute indirectly towards local

economy in terms of hiring of transport, labour, procurement of stores, expendables etc. An assessment of the percentage share has been quantified as a multiplication factor (ibid factor is an assessment). Analysis of the capital budget is reproduced below. Total DSE is Rs 26,43,707,77,46,000/-. It is observed that the overall contribution of each service has been quantified above. Summarised totals of ibid tables have been aggregated at Table below. Total Contribution to Nation from only Capital Services Budget in DSE has been quantified at 28%.

Type of Contribution	Army	Navy	IAF	Total
Taxes - Capital Budget * Figures in Crs	4.22	18.03	5.20	27.44

Table 3.11: List of Appendices Containing Budget Data

(Source: Table prepared from data as per Appendix)

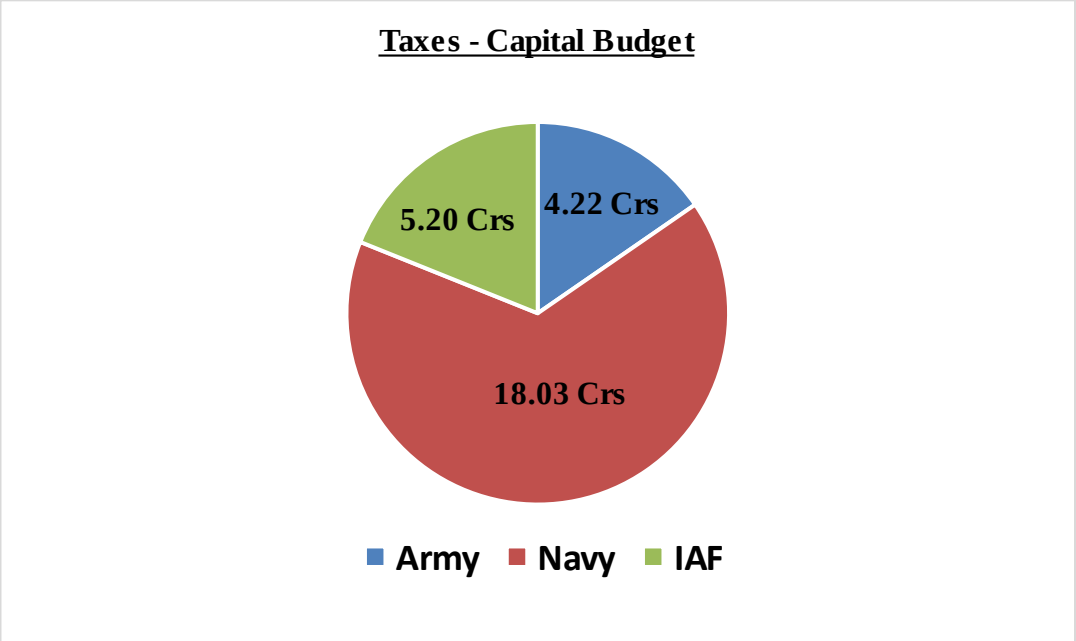


Chart 3.15 : Taxes from Capital Budget

(Source: Chart prepared from data as per Appendix)

S No	Type of Contribution	Army (Crs)	Navy (Crs)	IAF (Crs)	Total (Crs)
(a)	Direct Taxes (Income Tax)	8.96	0.32	1.52	10.80
(b)	Indirect Taxes	103.77	1.69	4.64	110.09
(c)	Indirect Stimulus to National Economy	24.27	1.95	2.30	28.53
(d)	Taxes from Capital Budget	4.22	18.02	5.19	27.43
(e)	Stimulus to Local economy	9.61	38.94	11.52	60.06
	Total	150.83	60.93	25.17	236.94
(f)	DRDO Budget Contribution to Nation Building				4.10
(g)	OFB Contribution to Nation Building				3.75
	Total Contribution to Nation Building				244.79

Table 3.12: Summary of Contribution - Capital & Revenue Expenditure

(Source: Table prepared from data as per Appendix)

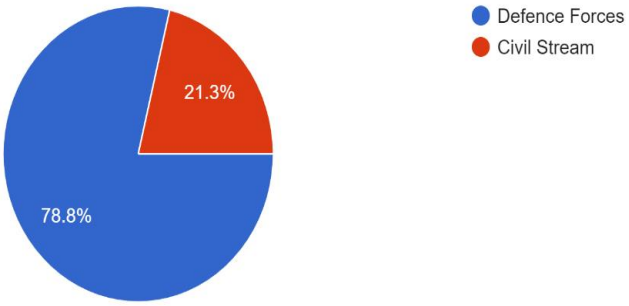
Questionnaire : Defence Budget Efficacy & Growth

The under mentioned Questionnaire was designed and forwarded to collect primary data on the impact of defence budget on economic growth and to check it's efficacy. The questionnaire was forwarded to senior defence and civilian officers with service range varying from 20 to 35 years. 80 responses were received for the Questionnaire.

Note : The following questionnaire has been designed to study the efficacy and effectiveness of the defence budget. Participation in this survey is voluntary. The procedure involves choosing the most appropriate answer for all the questions. Your responses will remain confidential.

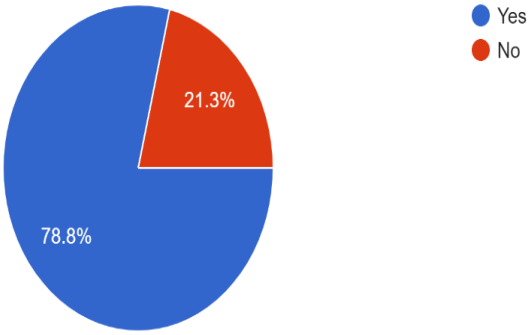
Please indicate whether you are serving with the armed forces or in civil stream

80 responses



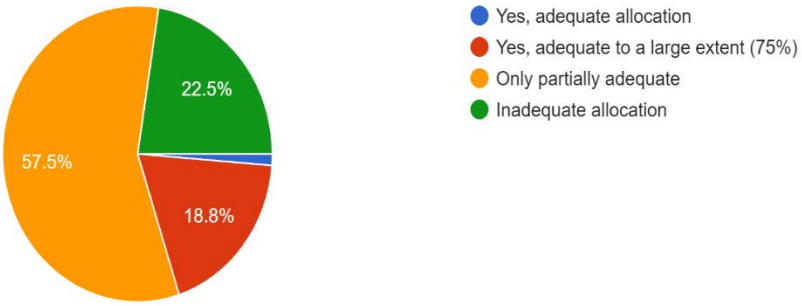
Q1. Is there a pattern in allocation of India's defence budget?

80 responses



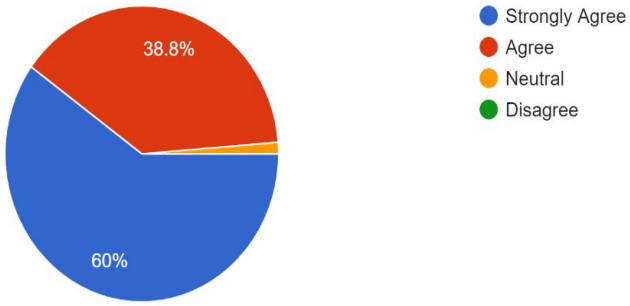
Q2. Is the defence budget allocation as per the demands of the services?

80 responses



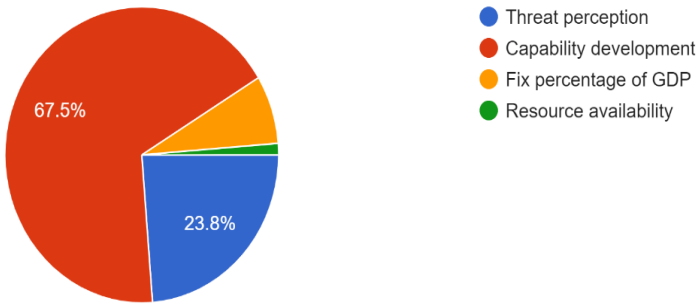
Q3. Do you think there is a need for major reforms in the defence budget?

80 responses



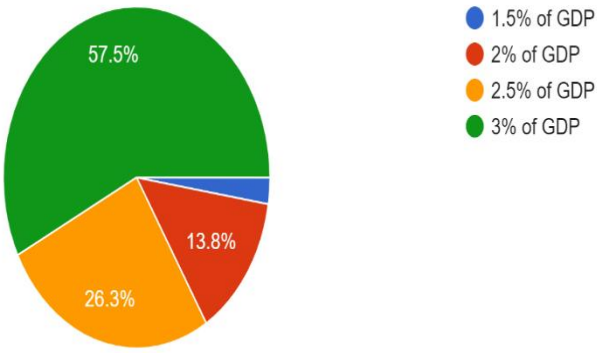
Q4. The defence budget allocation should be based on which of the following:

80 responses



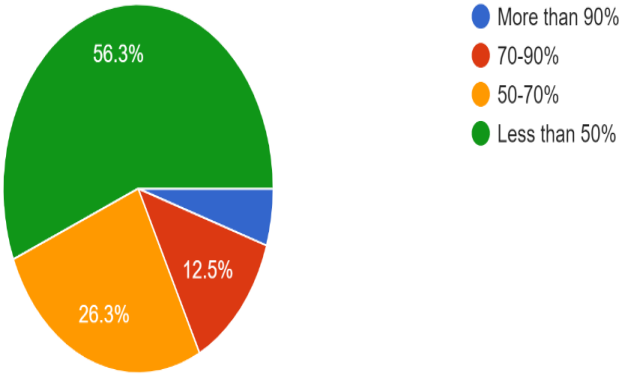
Q5. What percentage of GDP should be allocated for defence expenditure?

80 responses



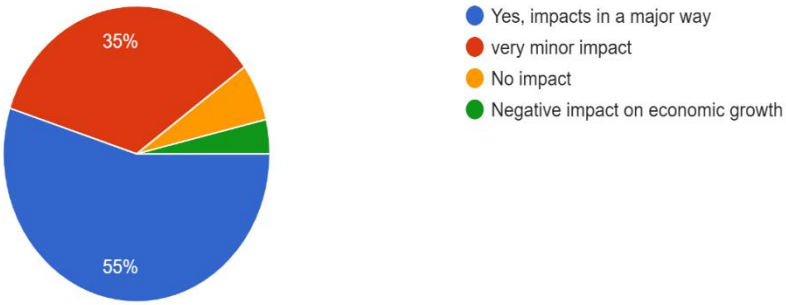
Q6. What is the efficacy of defence capital budget for meeting the modernization needs of the armed forces?

80 responses



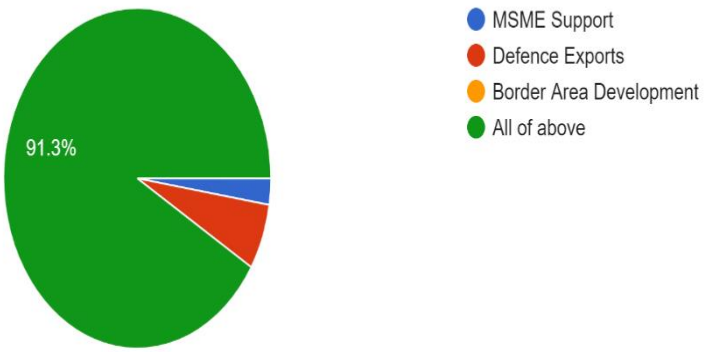
Q7. Does the defence budget has an impact on economic growth of the country?

80 responses



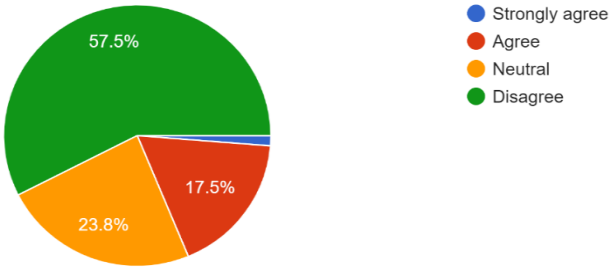
Q8. What factors of defence budget contribute to economic growth?

80 responses



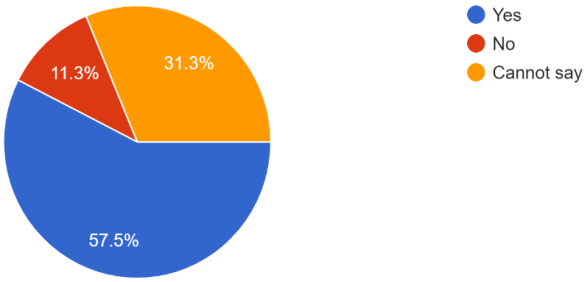
Q9. Increase in defence spending is negatively impacting other sectors, especially the social sector.

80 responses



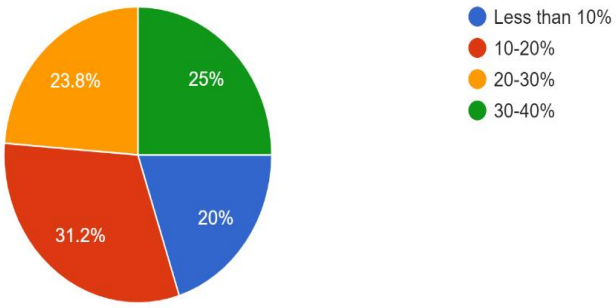
Q10. Does the defence budget have a multiplier effect on economic growth?

80 responses



Q11. What is the percentage of defence budget ploughed back into the economy?

80 responses



Q12. What do you feel are the drawbacks on the present defence budget allocation and expenditure?

Capability Development.

- Budget is not focused towards capability development of defence forces, based on the threat existing.

- Capability building is needed for achieving the required deterrence and to reduce the strategic gap with our adversaries.
- Budget should be allocated based on the combined capabilities of the three forces.
- Aim should be to achieve synergy/jointness and avoid duplication of resources.

Allocations

- Despite marginal increase, resources are not enough to meet the services requirements.
- Also, a large portion of the budget is utilised for Pensions & Salaries.
- There is a growing mismatch between the financial requirement projected by the armed forces and the outlays allocated, to meet the modernisation needs.

Pattern

- Def budget is allocated as per the committed liabilities and forecast requirement of revenue expenditure with addition/deletion of some amount, that can be varied for aspects like Wks, maint / MES etc.
- Present defence budget and expenditure is on ad-hoc basis and does not cater adequately towards capability building.
- Skewed capital and revenue expenditure, needs to be tweaked for meeting the modernisation needs.

Capital Expenditure.

- Limited availability of budget for capital acquisitions.
- Most of the defence budget is utilised for revenue expenditure, leaving limited amount for modernisation and procurement.
- Allocation for capital projects needs to increase for building modern logistics infrastructure.
- Capital acquisition once commenced, should follow its full course till materialisation, irrespective of the financial year.
- Induction of new technology and Obsolescence of equipment is affected, which needs to be catered for.

Procedural Delays

- The propensity to spend is lacking due to lengthy procurement procedures.
- IFA system & Internal Audit by CDA needs to be strengthened.
- Audit personnel who routinely delay accord of sanctions for expenditure and payments be made accountable.

- Auditors be asked to accept bills online and make payments within stipulated time, to eradicate corruption and bring accountability.
- Budget amount released is less initially and the bulk is released towards the year end, when procedural delays prevent timely procurement.

Efficacy

- Budget is not being utilised judiciously and is grossly inadequate for the size of the armed forces.
- Lack of decision making in big ticket purchases due to apprehension of political criticism and kickbacks in the past have affected major purchases.
- Not properly forecasted, planned and implemented.
- Lacks long term strategy and not in sync with long term security objectives of the country.

Imports

- Heavy reliance and dependence on imports affects the defence budget.
- Make in India under defence budget should be binding on major OEMs, with impetus on investing in India.
- Strong defence manufacturing base with focus on improving indigenous research and development with the help of private sector needs to be developed.
- Defence exports are needed for sustainable growth and to help the economy.

Budget Reforms

- Annual contracts be undertaken with all OEMs and Price Lists be put on the Internet.
- Approvals for making online payments without the requirement of NOC, three quotations etc may be done away with.
- Powers of all CFAs be enhanced.
- Common inventory to extent possible will help save precious revenue from the budget.
- The def budget should be carried forward rather than lapsing at end of financial year. This could be based on a five-year roll-on budget.
- Services need to resolve issues of revenue expenditure, and procurement processes.

CHAPTER 4

Indigenisation Through Defence MSMEs & Efficacy of Expenditure For Modernisation

The Indian defence industry has for long remained in its infancy. Whether one attributes this fact to the "self-sufficiency" doctrine adopted by India post-independence or incompetency of the military-industrial complex to absorb technology, the result is India is in a vulnerable position to defend its interests. It is imperative for India to shift gears and drive itself towards 'self-reliance'.

India has a defence budget of over Rs 2 lakh crore and spends more than 40% of it in capital acquisitions. Nearly 70% of its needs are met through imports. The business emanating from the offset arrangement is projected to reach a huge $15 billion mark in 10 years' time. There is a pertinent need to leverage these offset benefits that will be in the offing in the coming decade. Naturally, the role that the private sector and Micro, Small and Medium Enterprises (MSMEs) will play will be pivotal in realising India's dream of having a strong domestic defence industry.

Defence MSME

India's MSME are the vein of Indian defence sector. Currently in India, about **10,506** MSMEs are working for the defence sector and are generally dependent on DGOF, DPSUs and DRDO etc. Ordnance factories outsource around 40% of their production in the form of components and sub-assembly requirements, mainly from MSMEs. According to the Committee of Experts, almost 80 percent of component aggregates and assemblies of complex weapon system and aircraft are made by MSMEs, which are part of supply chains.

The MSMEs have been at the mercy of 'not-so-friendly' policies floated by the Government of India for many years. Nonetheless, MSME have had a major say in

the manufacturing sector. The MSMEs contribute nearly 8% of the 16% share that manufacturing sector occupies in our gross domestic product. Even without reaching its true potential, MSMEs in the defence sector employ nearly 2 lakh people directly and 6 lakh people indirectly.

There are two routes through which the MSMEs can be brought under the umbrella of defence equipment manufacturing. The first is through purchases made under the 'Buy (Indian)' and 'Make' categories that will allow them to directly bid and win contracts. The second is through purchases made under 'Buy and Make with ToT (Indian)' and 'Buy (Global)' categories, where the offsets will come into the picture. The difficulties associated with each of these routes attract lukewarm responses from small vendors/ entrepreneurs, in terms of getting into the defence sector and Foreign suppliers, in terms of finding an Indian offset partner and setting up a business.

Indigenisation

'Make in India' programme is being used by the Government for defence procurements to achieve growth. In pursuance of 'Make in India' initiative of the Government, multiple measures have been taken to achieve substantive self-reliance in defence production. These measures will transform India into a defence Manufacturing Hub. Under 'Make in India', provision for Maintenance TOT (Transfer of Technology) to Indian Industry partners will add economic growth and develop India's defence manufacturing industry. The role of the armed forces is a key agent for the development of R&D, innovations, and transfer of technological assets to the companies. The defence sector acts as a catalyst for such inventions driven by defence technologies. Defence technologies will play a vital role in contributing towards the SDGs and is closely inter woven with them.

Promoting MSMEs and Powering National Growth

Besides accounting for almost 40% of India's Industrial production, the MSME sector is also a lifeline to the most advanced sectors of the country such as Auto, Engineering, Electricals, Electronics, IT & Biotechnology among others. In FY 2019, there were 8,643 MSME vendors who were making defence equipment for the government. This number increased to 10,506 in FY 2020. While the number of Indian defence equipment manufacturers has increased, it is yet to reach its full potential. MSMEs in the Defence Sector impacts following aspects: -

(a) MSMEs generate employment opportunities for a large workforce who are skilled/semi-skilled.

(b) Defence MSMEs form an ecosystem complementing each other. This fosters economies of scale, assured offtake and drives innovation and infrastructure creation.

(c) Defence MSMEs are bound to comply with well-defined production processes and Quality Assurance. This enhances responsible production and consumption.

Employment Generation - MSMEs. SMEs have an enormous edge because their employment potential is maintained at a low capital cost. The national objective of inclusive growth can be fulfilled only by SMEs through the creation of highly productive labour intensive direct/ indirect jobs. The employment generation capability of the SME sector is estimated to be almost four times that of large enterprises for a given investment. The Vijay Kelkar Committee report has projected the economic impact of reducing defence imports from the current 70%. The report highlighted that a mere 25% reduction of foreign dependence on defence imports will save the foreign exchange outgo by Rs 85 billion, accelerate manufacturing GDP growth by 8% and create 120,000 new jobs.

Participation - Global Supply Chain

MSME contribution to defence exports has been increasing, thus thrusts on being part of global supply chain. The exports from private sector including MSMEs contributes around 80% of total contribution of private players. Also, in the total export of Defence Public sector Undertaking (DPSU) and Ordnance factory Board (OFB) large share of MSMEs exists who are the supplier of sub-systems and components.

The exports from MSMEs and Private sector are increasing due to liberalisation and amendments in various policies. The MSMEs sector is mainly exporting the defence equipment including Mechanical parts, Fuze Point detonating M 572 (assembled with no explosives), light mechanical engineering, , Compass, Laser Range Finder, TIFCS, TIFCS Installation Kit, Ammunitions, Bulletproof Vest, Fragmentation Jacket, Multipurpose Support Vessel, Secure Handheld Radio & Services, Cable Looms, Bulletproof Vest/ Plates, Helmets, Bulletproof Ceramic Panel. Vacuum Interrupter, Work Packages/ Forgings, Transmitting Tubes, Electronic Assemblies, Mechanical Parts, Vacuum Interrupter etc.

Looking at the Industrial License issued to Defence Industry, almost 70% licenses are being issued to MSMEs only. Indian MSMEs sector has the potential and aim to grow. Most of the licenses were issued for Land Systems, followed by Naval and Aero systems. MSMEs create value addition and bring innovation as they are ready to take risk. They believe in doing things differently to stay ahead of competitors and are also best to respond to the ever-changing needs of Industry. Due to less dependency on machinery and more on labour, they take less time to respond to the changing needs. They can be the best people to work with at low cost. Outsourcing from MSMEs will not only help save cost and time, but also in timely delivery of products. The pillars of growth for MSMEs have been the power of knowledge, collective

learning to beat the lack of resources and innovation to cut the costs. The MSMEs, therefore, can deliver the most sought-after combination of low-cost manufacturing and cutting-edge solutions under one roof.

MSME Criticality - Defence Sector. MSMEs' access to the defence sector is strategically critical due to the following reasons: -

(a) It helps generate business for local industry/ MSMEs. It also creates positive externalities of additional employment and resource generation.

(b) It helps build deeper supplier base and build indigenous capabilities.

(c) It can facilitate development/ access to critical and cutting-edge technologies which hold potential of creating economy wide impact.

Manufacturing Base. Global economic slowdown combined with the CORONA epidemic disturbing supply chains is forcing manufacturers to shift base from China to low-cost countries such as India and Vietnam. SMEs in India have the potential to play a key role in manufacturing by leveraging lower cost and increasing demand. Recent amendments to defence policies have boosted indigenous manufacture of defence equipment. This would help India emerge as a global manufacturing hub. Indian defence industry and defence procurement must become increasingly collaborative with the private sector/MSMEs, to enhance the capabilities and core competencies in the emerging military technology sectors.

Issues - MSMEs

As the defence production targets vary on an annual basis, sourcing of components/sub-assemblies from MSMEs is not a constant and sustained activity. Therefore, to overcome this hurdle MSMEs will have to collaborate with big private organisation to regulate the supply of components. Also, it needs to maintain quality so that it can export the parts to other countries. The lack of state-of-the-art defence

technology and poor production capabilities are some of the major reasons for lagging by the players in the field of defence production. There are many other issues which restrict the MSMEs to perform. Poor infrastructure, lack of awareness of available technologies, high R&D cost, unpredictable market, low volumes, high technology equipment, strict statutory requirements, financial constraints, high processing, monitoring costs of loans and licencing are some of the issues[16].

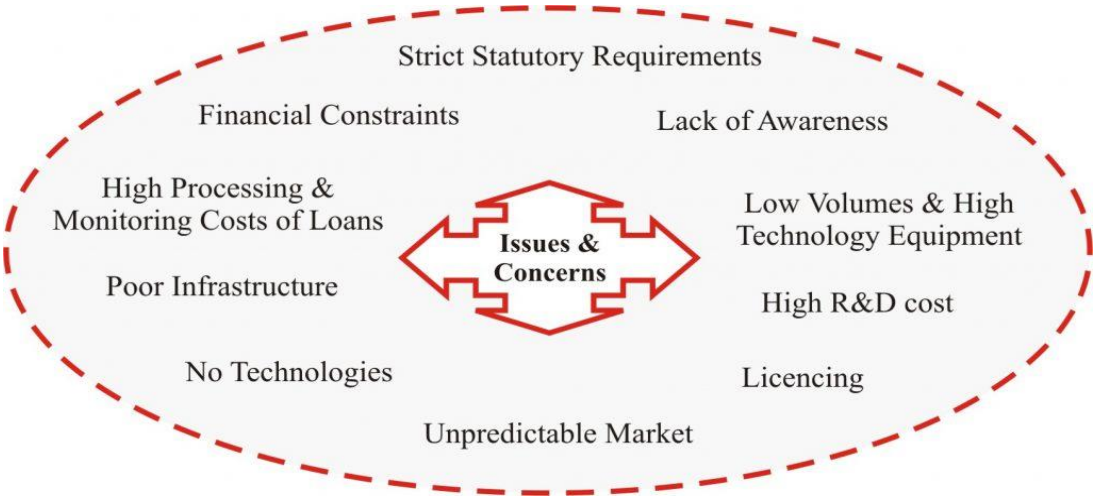


Chart 4.1 : Issues and Concerns Facing the SME

(Source : MSME In Defence: The Rising Stars by Kavita Nagpal)

Lack of Understanding. The request for acquisitions projected by the armed forces are esoteric in nature and cannot be understood by MSMEs. A small vendor cannot make much sense of these high-tech terms and it does not motivate him to take the next step. The lack of understanding also discourages the foreign supplier, as the Indian partner becomes more of a liability than a partner.

Lack of Prior Information. Defence ventures take more time to realise than any other commercial ventures. The private industry and MSMEs have no prior knowledge of acquisition plans. They come to know about it only when requests of proposal are invited. This does not allow the industry to carry out a feasibility study and find a foreign vendor to enter into a memorandum of understanding or set up a

joint venture. Moreover, the private industry and MSMEs are not represented on procurement-related decision-making bodies like Services Capital Acquisition Plan Categorization Higher Committee (SCAPCHC), DPB and DAC, which bereaves them from any kind of participation.

Access to Finance. The development and production of defence machinery is costly and credit has always been a roadblock for MSMEs. Sufficient credit must be made available to support any developmental activity taken up by MSMEs in the defence sector. The cost and access to finance are major challenges. Even if these hurdles are overcome, another nagging issue is the recovery of debts. The procedures followed to designate a loan as non-performing makes it difficult for the vendor to pool the extra money that can possibly help him avoid a trough.

Service Requirements. The defence industry is subjected to stringent quality standards and assessments. An average MSME lacks the discipline to satisfy these requirements. The testing guidelines and military standards are exhaustive and causes disinterest to the interested. Support from Defence Public Sector Undertakings (DPSUs) in educating this fraction of the industry is inappreciable. There are also no training and assistance cells in helping MSMEs understand the requirements.

Mapping - Supply Chain. A large fraction of the industry is disjointed, and there is no mapping of the enterprises that can potentially become defence manufacturers. The Department of Defence Production has been mandated to identify and map prospective agencies for development and/or manufacturing, but the efforts so far have been inadequate.

Intellectual Property. India lacks a robust mechanism to protect the intellectual rights of foreign vendors. This is a huge drawback since it will compel foreign suppliers to commit everything but for state-of-the-art technologies that are

dearly sought. No original equipment manufacturer (OEM) wants to part with its core technology, and this results in poor quality of incoming offsets.

Quality - Offset Benefits. One major objective of the offset policy is to have transfer of technology, and to increase exposure and skill-up the domestic industry. The Vijay Kelkar Committee has made undermentioned important observations with respect to the Indian ToT model:-

- It is confined to DPSUs and Ordnance factories.
- The depth of technology transfer is inadequate.
- It essentially comprises transfer of drawings and processes for manufacturing and assembly, and no real transfer of technology. Adopting the ToT model for the manufacturing of imported equipment through licensed manufacture has not been a success.
- The dependence on Original Equipment Manufacturers (OEMs) for upgrades has only increased, not decreased.

Guarantee on Investment. No minimum order quantity upfront is a non-starter. Under such circumstances, development costs make the business proposition risky.

Mindset. Indian entrepreneurs perceive defence manufacturing as an impractical business proposition and feel unprepared and incompetent to execute a project.

Capabilities. The Indian Defence Industrial Base has to develop as Strategic Partner, Development Partner and Competitive Partner. System integrators need to remain committed towards the core job of system integration and aim to develop a chain of niche MSME suppliers who can not only be trusted partners, but also have the opportunity to be a part of global supply chain of OEMs, thereby creating value for Indian industry. The ladder can be created by creating capabilities all segment of

industrial base Large, Medium, and Small-Scale industry in line with the world developed defence industry[16].

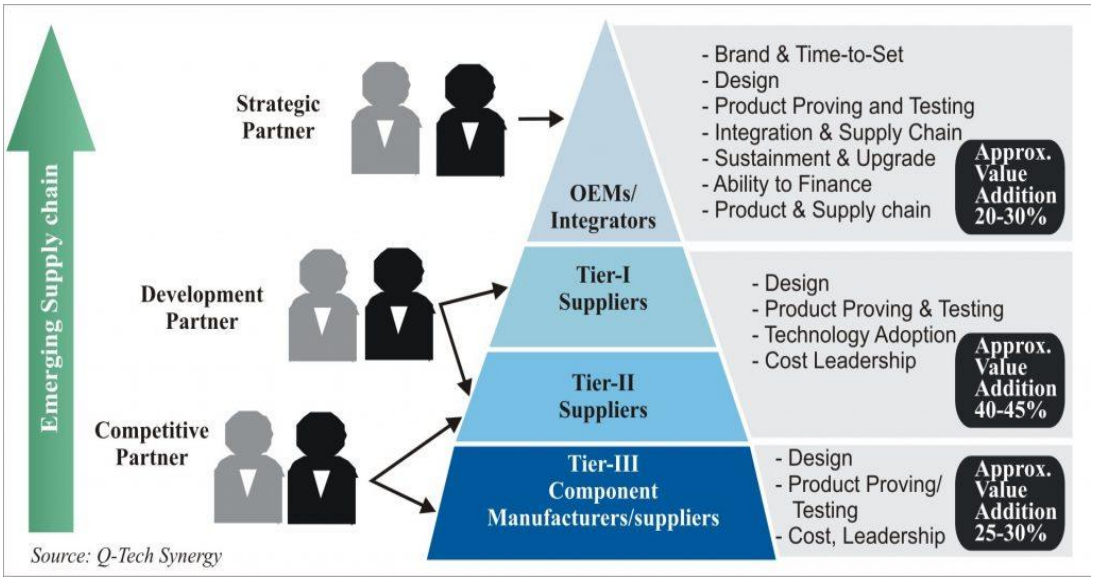


Chart 4.2

(Source: Q-Tech Synergy, MSME In Defence: The Rising Stars by Kavita Nagpal)

The supply chain as depicted in Chart 4.2 shows the contribution by each Tier supplier. Tier-I is normally reserved for the public sector entities and selected big private companies, as they can spend on research and development cost. Role of the MSMEs would still be limited to being Tier-II and Tier-III suppliers. The fact remains that till MSMEs are enabled to function as Tier I or Tier II vendor, MSMEs will stagnate as supplier of mundane items only[16].

System integrators/OEMs will need to create a viable supply chain. Indian companies will need to evolve models that rest on a triad of technology, applications and production, in a manner that engages with DRDO, DPSUs and other private players to be successful. Structural shift likely in India, in line with global model, where the integrator does about 20 percent of value add and relies on suppliers. A vibrant defence industrial base would enable utilisation and consolidation of existing capabilities in fostering a constructive, long term partnership with global OEM to be

part of Global Supply Chain and augment the role of Indian private sector companies to develop capabilities/capacities through joint ventures and partnerships. There is a need to build a tiered defence industry structure as System Integrators and Sub-System Developers for in-country capability, inclusive of MSMEs with each tier.

Technology- Defence Industry. The Indian defence industrial base needs to ramp up the design & production capabilities in following technological areas:-

(a) Thermal imaging, image intensification and infrared based equipment.

(b) Sensors, detectors, radars and early-warning systems.

(c) Wireless and mobile surveillance systems and IP surveillance solutions.

(d) GPS and GSM-based tracking systems.

(e) Interception and monitoring systems.

(f) Trajectory correction system and missile guidance.

(g) Advanced Rocket technology.

(h) Active Tank protection systems.

(j) Metallurgy and forging techniques for guns.

(k) Automotive technologies.

(l) Surveillance, communication and navigation technologies.

(m) Miniaturisation and nanotechnology.

(n) Networking technologies for seam-less integration.

(o) System Simulators.

(p) Access control and identification and biometric based systems.

Promotion - Defence MSMEs. MSMEs should undertake the following:-

(a) Efforts should be made to provide MSME with access to information on business opportunities globally to enable them to build relationships with international MSMEs in global defence programs.

(b) MSMEs should focus on innovation, building intellectual property, and adopt quality, process standards to be able to offer complete sub-systems or assemblies as well as testing/certification services.

(c) Tailor made courses on categories in aerospace & defence be offered in Indian educational institutes through industry government institute partnerships.

(d) There should be rapid development of domain knowledge in the private sector by hiring and training of engineers from leading engineering institutes with support from aerospace and defence sector specialists from abroad.

(e) Common facilities for design, testing and simulation be established in MSME clusters, as required, on a pay-per-use model.

Recommendations

Technology Perspective and Capability Roadmap (TPCR). TPCR must be translated to a more easily understandable document. It must ultimately help in creating a 'Directory of Needs', which a vendor can readily refer, and orient his business plans. Nationwide seminars must be conducted by inviting prospective manufacturers and designers, explaining the modernisation plan and what is expected out of the industry. The possibility of creating a National Defence Archive, an online repository of defence equipment aimed at educating the MSMEs on various warfare machinery, must be considered, without risking security. The Defence Acquisition Council must have representation from the private and MSME sector while deciding on acquisition plans in the future[17].

Easy Entry and Exit. The MSMEs should be encouraged to take up defence manufacturing by providing them with ample financial and technical support to start their ventures. There must be better regulations. The fear of not getting out of a business at will also precludes small investors from investing in defence ventures and

hence, the exit also has to be smooth. The need for a bankruptcy code for defence manufacturers is strongly felt. A safety net must be in place to help a vendor avoid breakdowns that cannot be overcome. If such circumstances are inevitable, capital acquisitions, which grab a major share in one's investment, must be brought back at a competitive price. The absence of a minimum order quantity was a major factor that blocked small businesses from entering the competition. The current government had decided to bear the developmental costs up to as high as 100%.

Higher Lending. Defence manufacturing requires large amounts of investments up front, and the lending must go up. Between 2012 and 2018, MSME loans went up by nearly 70%, which is a positive trend. The banks have to be liberal in assessing threats of non-repayment. Repayment should be viewed with minimal caution. The interest rates for lending must be brought down. Ease of access to finance should be improved. The Reserve Bank of India licensed as many as 14 new payment banks in the last two years. This should help and improve accessibility.

Defence ventures have to be given a leeway while deciding upon their non-performance. Designating a loan as non-performing prohibits the vendor from giving the needed stimulus and get out of a rough patch. Investigations must be carried out to find out if it is commercial or technical non-performance. The possibility of subsidising a loan where commercial non-performance is found can be envisaged. Banks see handholding as a liability, only few do it out of the value that it adds to their brand. Nationalised banks must be directed to finance at least five defence ventures per state in the coming year.

Cost of Doing Business. 'Ease of doing business' is a slightly overrated index in the Indian context. What we should be really focusing on is the cost of doing business. The cost of land, the cost of human resource, the cost of other resources like

electricity and connectivity. To allocate these resources swiftly will require centre-state synergies. Even though the task of developing MSMEs is entrusted to the state government, defence is a Union subject. Hence, cooperation at all levels is necessary.

A predictive tax regime will help immensely in forecasting a more accurate cost of doing business. The corporate tax for Indian firms has been brought down, which is a good trend. Export promotion will be another avenue which can reduce the cost of doing business. To promote exports, consortia should be built and missions and delegations must be sent to foreign trade fairs and asked to attract business. Domestically, the restrictions imposed by the Director General of Foreign Trade (DGFT) could be looked at again.

Integration - Supply Chain. On lines of the Secretary of Defence (Office of Small Businesses), in the United States, an agency dedicated to mapping, integrating and forming clusters of companies must be realised. The cluster must be based on the businesses that MSMEs are already doing. A secretary must head each of these clusters and their duty must include bringing business to their designated cluster[17].

A registry of 'good performers' in the MSME community must be created and made public to create a competitive atmosphere and increase awareness on the opportunities that exist. The Defence Offsets Management Wing should also start building strong links with the industry as it is specifically mandated to assist vendors in interfacing with Indian industries.

Technology Development Fund. In Defence Procurement Procedure (DPP), a Defence Technology Fund was envisaged and started with a token allocation of Rs 100 crore to support defence research and development (R&D). The guidelines set for the utilisation of these funds are rather unrealistic.

Technology is fast changing in today's world and defence related technology is no exception. To keep the Armed Forces in a state of readiness and equipped with the latest technology, the defence acquisition policy has to have a two-tiered approach: -

(a) Continue to look forward for new technologies in the world and with the help of Indian scientists/ engineers, imbibe them into our systems.

(b) Maintain, replace and meet regular requirements of varied defence equipment in demand to be less dependent on foreign imports.

Technology Partnership. The timely updating of technology is necessary and it is easier to upgrade the smaller private production units, as compared to public ones. With the opening of defence industry in India, private participation in the defence sector is helping transform India into a defence industrial base, capable of producing world class products at highly competitive prices. MSMEs play a significant role in this as they have the capability to produce sub-systems and components of primary equipment. Technology partnership as a new strategy of cooperation is also helping in tapping the potential of SMEs. An evaluation of the Public Private Partnerships (PPPs) in defence sector in UK indicated that this partnership gave the government access to private sector capital to exploit its technologies/capabilities into wider markets for the benefit of the economy. The agencies like Defence Research and Development Organisation (DRDO) with its advanced R&D facilities can further look for strategic sub-contracting of production in various projects among SMEs.

DPSUs Helping MSMEs. The DPSUs are best placed in our structure to educate MSMEs on the principles of defence production and service quality requirements. Vendor development programmes must be taken up more rigorously. The MSMEs must be given access to test facilities after due security checks, and they must be invited during certification processes. This will help a designer from an MSME have a

wider appreciation for what is expected and help him craft his design. The Tier-3 suppliers of DPSUs should not be restricted to drawing reading and manufacturing without the understanding of the product. An outreach programme must be launched to encourage MSMEs to bid and win sub-contracts coming from DPSUs[17].

Vendor Database. There is a need to create a comprehensive vendor database indicating the capabilities of all MSMEs for the benefit of OEMs and prime contractors. The increasing role of MSMEs in the emerging aerospace and defence environment will augment India's indigenous defence production substantially. MSMEs need to focus on achieving the stringent benchmarks related to cost, quality and delivery.

Long Term Public-Private Partnership. Indigenisation of defence manufacturing will bring significant benefits in the form of reduced foreign exchange outflow, accelerated GDP growth and creation of new high value added jobs. Indigenisation could be achieved through long term public-private partnership in defence R&D, product design and development, and marketing by leveraging India's strengths in information technology and manufacturing.

Single-Window Clearance -MSMEs. An environment must be created wherein a vendor walks in with the proposal in a given template and walks out with all the clearances and the credit in his hand in a few visits. For this purpose, creating a new bank under Small Industries Development Bank of India, 'Defence-MSME Development Bank', should be considered.

MSMEs - Start Small. At any given point, there are about 130-140 schemes for procurement that are active, and nearly 40% of them are worth less than Rs 150 crore. This window for business will be a good starter for new MSMEs. Depending on the acquisition costs, Defence Acquisition Council must intimate the secretary of the

MSME ministry about the opportunity with sufficient lead time and not at the time of issue of a request for proposal.

Transparency. Transparency has to be brought in while awarding offset contracts. The parameters to select an offset contract will bring much more clarity to a vendor on what he needs to do in order to bag a contract. The MSMEs and reforms clearly have a long way to go. Inculcating a mindset in MSMEs that does not think of defence production as exclusive to DPSUs/ big players and removing the notion that defence production is not similar to any other production are the challenges that only awareness and education can resolve. Meanwhile, MSMEs need to be more disciplined and reach out for available opportunities.

Flexible FDI Policy. A flexible FDI policy will help India attract international players with requisite technology to design/develop defence products. The Indian defence industry should develop a large-scale indigenous industry that produces strategic arms and ammunitions for the global community. Offset arrangements can support this process to foster modernisation. Indian defence companies need to specialise in niche capabilities and strengthen their relationships with international suppliers to increase exports.

Drivers for SMEs. The defence market potential for SMEs is expected to be driven by the following: -

(a) **Offset Program**. Foreign companies that benefit from Indian orders for commercial and defence equipment have had to plough back outsourcing work worth 30% to 50% of the total deal size to Indian companies. This benefits the Indian companies engaged in designing aerospace & defence systems.

(b) **Design & Integration**. OEMs in the aerospace and defence sectors are shifting their focus to design and systems integration from vertically integrated manufacturing.

(c) **World Class Processes**. Global aerospace majors, including Boeing and Airbus are working with Indian firms in aerospace design/manufacturing, helping them to improve their capabilities and enhance their work profile.

Contribution to Value Chain. There is an enormous cost associated with development of technologies with costs also allocated to skilled scientific manpower and subsequent production infrastructure. Focusing on 'Make in India', we should at least have the ability to provide a life cycle support i.e., repair and maintenance if not mid-life upgrade. By involving MSMEs in the 'Make in India ladder' we can reduce the imports drastically. A planned upgradation program both for managing obsolescence as well as infusing additional capabilities by way of inserting contemporary technologies need to be picked up by developing the industrial base, which is not possible without the involvement of MSMEs.

Suggested Solutions. MSMEs are mostly the people who are first generation entrepreneurs, and have the hunger to establish their businesses. They take risks and never leave any stone unturned in finding success. They are the people who create more jobs in the market. However unskilled manpower and Technology are the biggest hurdles for MSMEs to participate in defence manufacturing. Some of the recommended solutions are: -

Lack of Skilled Manpower

- Develop associations, networks and hubs to bring small businesses together to share best practices and resources.
- Labour exchange programmes, by technical trained employee to share skills.

- Anytime assistance programmes, through online, phone and in-personal.
- Encourage employee from MSMEs to come forward as professional human resources for the organisation.
- Provide time-to-time training, to learn new skill set.

Technical Knowledge & Quality

- Arrange workshops and seminars of successful MSMEs to share their story.
- Easy-to-use technology and solutions should be promoted among MSMEs
- Partnering with large private sector organisations
- Incentives to private organisations to involve MSMEs in manufacturing process
- Incentives to MSMEs to adopt technology and maintain quality.
    - Showing long term perspective and cost-benefit analyses for different technology platforms
    - Share technological cost by making a cluster of small and medium firms.

IDEX : Aero India-2021

Attaining self-reliance in the manufacturing of defence equipment is a crucial factor for maintaining India's strategic autonomy. The IDEX (Innovations for Defence Excellence) initiative stands out as one of the most effective and well-executed defence Start-up ecosystems created in our country. It is a decisive step towards achieving self-reliance in the true spirit of the Aatma Nirbhar Bharat.

Launched in April 2018, iDEX aims to achieve self - reliance and foster innovation and technology development in Defence and Aerospace by engaging Industries including MSMEs, start-ups, individual innovators, R&D institutes, and academia. iDEX has partnered with leading incubators in the country to provide hand holding, technical support and guidance to the winners of iDEX challenges. The Start-up India programme today boasts an ecosystem of more than 41,000 Start-ups and 4.7 lakh

jobs. Rs 4,500 crore investment had been made in 384 start-ups through the Fund of Funds scheme[18].

The country's economy will soon be driven by these Start-ups, and these being latest entrants in the defence manufacturing sector required that extra push. Steps have been taken to foster and encourage this part of the private industry like opening of patent laboratories of DRDO to private industry and setting up of young scientist laboratories in niche technological areas. The aerospace sector itself has 300 plus start-ups currently engaged under iDEX. 10 Start-ups have developed products worth Rs 100 crore which have been displayed at Aero India-2021. 45 MSMEs who participated in Aero India have already got orders worth Rs 203 crore and will grow further.

CHAPTER 5

Defence Exports & Impact on Economic Growth

Defence Exports & Growth. From being a biggest importer of defence equipment, India is slowly emerging as an exporter now and has seen a growth of over five times in the last four years. India's export of military equipment increased from Rs 1521.86 in Financial Year 2016-17 to Rs 8,620.59 Crs in the last fiscal 2019-2020. The Defence Minister at HAL said that by 2024, ₹35,000 crore would be achieved. Some of the major export destinations for defence products have been Italy, Maldives, Sri Lanka, Russia, France, Nepal, Mauritius, Sri Lanka, Israel, Egypt, UAE, Bhutan, Ethiopia, Saudi Arabia, Philippines, Poland, Spain, Chile etc. The major defence items being exported are Personal Protective items, Offshore Patrol Vessels, Advanced Light Helicopter, Avionics, Bharati Radio, Coastal Surveillance Systems, Kavach Launcher, FCS, Spares for Radar, Electronic System and Light Engineering Mechanical Parts, etc. The trend of defence exports for the last 10 years is as under:-

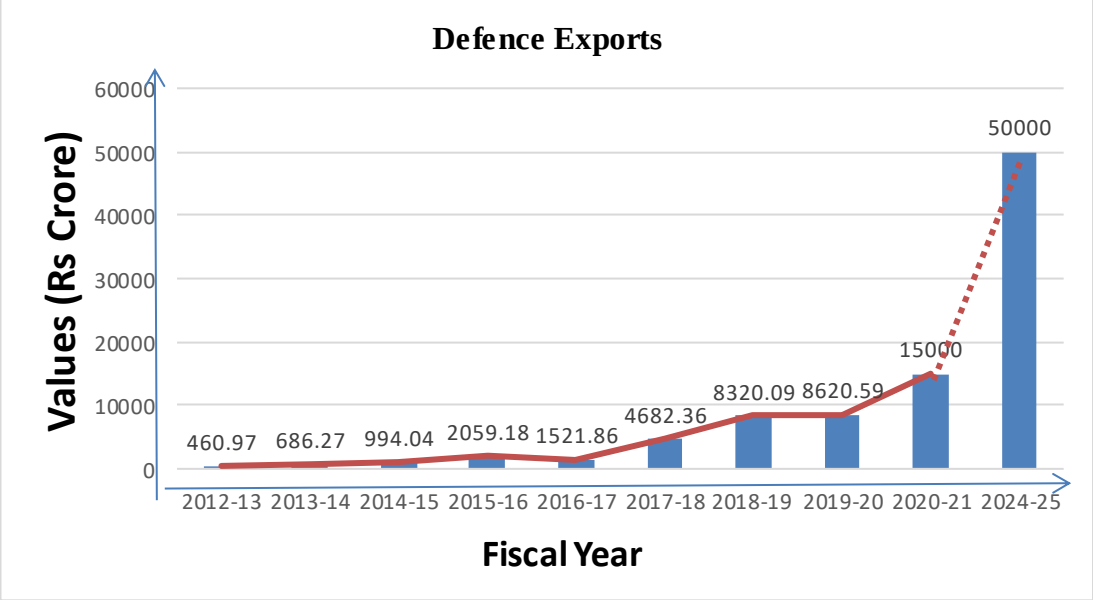


Chart 5.1 : Defence Exports

(Source**:** India's Military Expenditure, SIPRI)

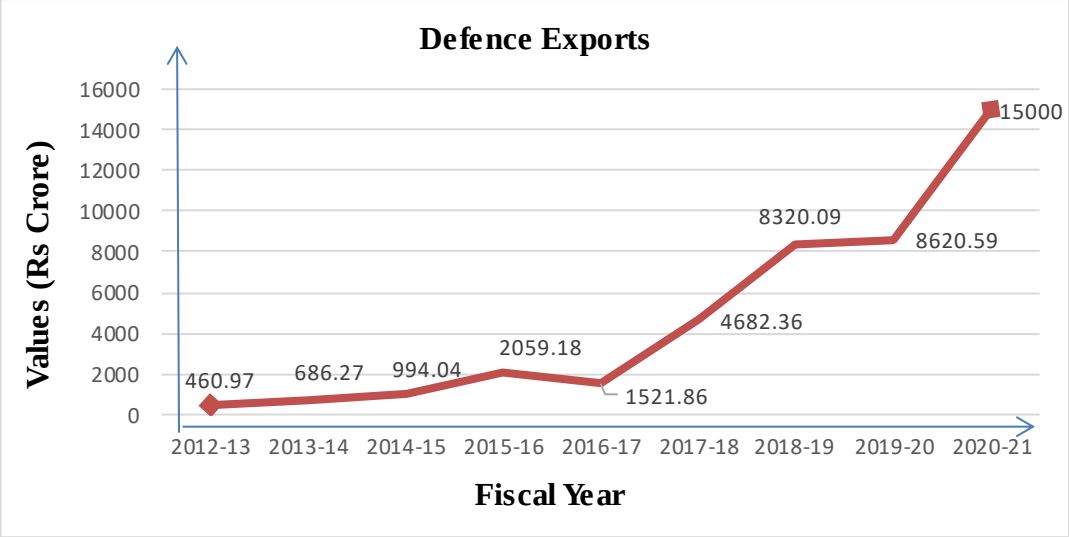


Chart 5.2 : Defence Export

(Source**:** India's Def Exports: Status, Strategy & Solutions, Manekshaw Paper, 2019)

Private sector companies are the biggest beneficiaries of export orders as per data released by Department of Defence Production. Their exports have increased from Rs 194.35 Crs in FY 2016-17 to Rs 8013.65 Crs in fiscal 2019-20. On the other hand, export by Defence Public Sector Undertakings (DPSUs)/Ordnance Factory Board have come down from Rs 1327.51 Crs in FY 2016-17 to Rs 403.94 Crs in 2019-20. 50 Indian companies in the private sector have contributed to defence exports[19].

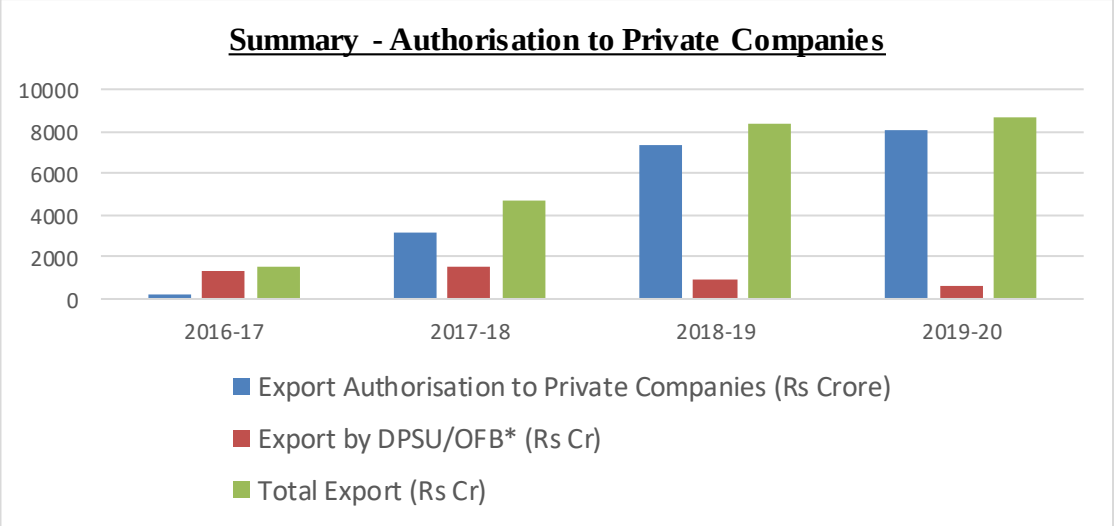


Chart 5.3 : Summary - Authorisation to Private Companies

(Source: MoD Data)

Implications. Amongst several sectors of the economy which are set to contribute to the growth, defence has been identified as one of the most prominent sectors under the 'Make in India' initiative. This implies that the production in the country has to grow by 15% Year on Year for the defence industry to achieve that level. The defence industry stands at a production of nearly Rs 80,000 crore in 2018-2019 and the private sector's contribution was about Rs 16,000 crore. About 20% of the production activities have been outsourced to private players.

The Defence Production Policy states that a yield of $26 billion in aerospace, defence goods & services by 2025 is the goal of the government. This will require a $10 billion investment and employment of about 3 million people. The defence sector has effects on India's attempts to promote and encourage R&D/innovation. It will have major implications & will give spin-off advantages to the economy. Suitable steps taken like easing the industrial licensing process, hiking FDI cap and other measures by the government will promote products in the defence sector by private players.

Equipment Approved -Exports. The Government in Feb 2021, gave its approval for the export of artillery guns, indigenous Light Combat Aircraft, tanks and missiles, explosive, anti-tank mines, and others. In total, 156 defence equipment have been approved for export by the government, in order to boost its arms export to friendly nations[20]. The list of the items was released by the Defence Research Development Organisation. Earlier, India had given clearance for the export of Akash Missile, but now even Brahmos weapon system, Beyond Visual Range air-to-air missile Astra and anti-tank guided missile Nag are also ready for export[21]. Defence equipment approved for export are:-

- 19 Aeronautical systems
- 16 Nuclear-biological-chemical equipment

- 41 Armament and combat systems
- 28 Naval systems
- 27 Electronic and Communications systems
- 10 Life Protection items
- Four Missile systems
- Four Micro-electronic devices
- Seven other materials

Defence Production & Export Promotion Policy (DPEPP-2020). The Ministry of Defence (MoD) has formulated a Defence Production and Export Promotion Policy (DPEPP-2020). The DPEPP 2020 is drafted as an overarching guiding document to provide a significant thrust to the defence production of India. This is a step towards the 'Atmanirbhar Bharat Package'. Defence Minister had announced the imposition of a phase-wise ban on the import of 101 military weapons systems and platforms in order to promote the domestic defence industry[22]. Objectives of DPEPP-2020 are :-

- To achieve a turnover of Rs 1,75,000 Cr (US$ 25Bn) including export of Rs 35,000 Cr (US$ 5 Billion) in Aerospace and Defence goods and services by 2025.
- To develop a dynamic, robust and competitive defence industry in India, including Aerospace and Naval Shipbuilding industry to fulfil the needs of the Indian Armed Forces.
- To make India self-reliant by reducing the dependency on imports.
- To take forward the 'Make in India' initiative.
- To promote the export of defence products and become part of the global defence value chains.
- To create an encouraging environment for R & D, rewards innovation, create Indian IP ownership and promote robust & self-reliant industry.

Strategies for Defence Exports. The strategies will focus on following aspects :-

Several reforms in the Defence Procurement Procedure have been proposed. DPP-2020 relies on the emerging dynamism of the Indian industry to build domestic capabilities for designing, developing and manufacturing defence equipment. A negative list of weapons will be updated periodically and notified year-wise for placing an embargo on the import of such items from those dates.

A Project Management Unit (PMU), would be set up for the acquisition and facilitation process of the contracts, building military capabilities. A comprehensive review and overhaul of the trials and testing procedures would be done to reduce the procurement cycle time. All AONs involving procurement from the domestic sources will be reviewed for the timely procurement.

Indigenisation & MSMEs/Start-ups. The indigenisation policy aims to create an industry ecosystem to indigenise the imported components and sub-assemblies for defence equipment and platform manufactured in India. 5,000 such items are proposed to be indigenised by 2025. An indigenisation portal will be developed for DPSUs/OFB/Services with an industry interface to provide development support to MSMEs/ Start-ups/ Industry for import substitution. Furthermore, the Make-II process will be strengthened and monitored, making it easy for the industry to provide indigenous solutions. Defence Investor Cell in Department of Defence Production will provide handholding to MSMEs, investors and vendors in defence production for resolving issues with Central, State and other authorities.

Optimise Resource Allocation. The Department of Defence Production has laid out a target to achieve a turnover of Rs 1,75,000 crores in Aerospace and Defence Goods & Services by 2025. The share of domestic procurement in overall Defence procurement is about 60%. In order to enhance procurement from domestic industry,

it is incumbent that procurement is doubled from the current Rs 70,000 crore to Rs 1,40,000 crore by 2025. In addition to this, it aims for allocation of domestic capital procurement at the rate of minimum of 15% per annum for the next five years. OFB/DPSUs would be mandated to increase productivity, enhance quality, reduce costs and ensure timely execution of orders at all levels.

Investment Promotion, FDI & Ease of Doing Business. India has improved in the ranking by World Bank in its 'Ease of Doing Business' report and has emerged as an attractive investment destination. Investments in the aviation sector will be encouraged which will help in co-development and strengthening defence ecosystem. Efforts will be made to fulfil the gaps in these segments.

Defence Industrial Corridors. Government has decided to establish two defence industrial corridors to serve as engines of economic development and growth of defence industrial base in the country. They span across Chennai, Hosur, Coimbatore, Salem and Tiruchirappalli in Tamil Nadu and Aligarh, Agra, Jhansi, Kanpur, Chitrakoot and Lucknow in Uttar Pradesh. The Defence Corridors set up in Tamil Nadu and Uttar Pradesh will act as additional support and will also offer higher multipliers for offset discharge for investments flowing into the Defence Corridors. As per the current FDI policy for the Defence sector, the investments will be made via automatic route up to 49% and via government route above 49%.

Innovation and R&D. By implementing the nationwide R & D capabilities, future requirements of the services could be met and critical gaps in related technologies be fulfilled. The strategies on Gas Turbine Engines, Hypersonic Missiles, Ballistic & Cruise Missiles, Submarines, Fifth Generation Fighters, Transport Aircrafts, Secure communication devices, Cyber Security Infrastructure, Surveillance Systems,

Artificial Intelligence & Robotics including unmanned platforms, Airborne Sensors and Strategic materials will be pursued.

DPSUs & OFB. Department of Defence Production has set up production facilities over the years for defence equipment through the 15 Ordnance Factories and DPSUs. Significant progress has been made by these units to manufacture arms and ammunition, tanks, aircraft, etc., but these organisations must be reformed so that they can work with the private industry. For this purpose, Ordnance factories will be corporatised to make them competitive and to improve their productivity. Efforts will also be made to create a multi-tier domestic supply chain.

Quality Assurance & Testing. Competitiveness of the Defence Industry depends on quality assurance. Thus, to streamline the quality assurance process and cut down the hold points and reduce the cycle time, an IT platform with an industry interface will be developed. For MSMEs, 'Zero Defect Zero Effect' policy is encouraged to improve the quality. Efforts would be made to create a testing infrastructure through Defence Testing Infrastructure Scheme by aiding industry to set up common testing facilities.

Export Promotion. To achieve the target of Rs 35,000 crore of Defence Exports by 2025, the following strategies are being pursued: -

- Defence Attachés have been mandated and are supported to promote export of indigenous defence equipment abroad.
- Domestically manufactured defence products will be promoted through Government-to-Government agreements and Lines of Credit/Funding, subjected to strategic considerations.
- Export Promotion Cell has been set up to promote Defence exports through coordinated action to support the Industry.

- The DPSUs & OFB would be mandated to have at least 25% of their revenue from exports.
- DDP would facilitate onboarding of Indian Offset Partners (IOPs) in the discharge of offset obligations by OEMs.
- Defence Expo and Aero India will be positioned as major global events to showcase India's capabilities in defence manufacturing and encourage exports.
- The end-to-end export clearance process in the Department of Defence Production would be further upgraded to make the process seamless and time-bound[21].

Growth: Correlation GDP & Expenditure. The relationship between military expenditure and GDP growth is complex. It is a matter of contest in economic literature and the findings of such study vary from region to region, country to country. A research work comprised of various independent variables including military spending, explored their effect on economic growth and per capita income over 85 countries including India for the last 20 years from 1998 to 2017.

Middle East and Africa. For the countries in the Middle East and Africa, evidence generally supports a negative relationship between military spending and GDP growth. Models suggested that the impact of defence expenditure on economic growth is negative, since less money is available to invest in other areas like infrastructure, health, education, and production of routine goods. The results show that military expenditure has a significant negative impact on growth in Africa.

Impact of Arms Exports. One notable change depicted was the interaction effect of military spending and arms exports, it has a significant positive effect, showing positive complementarities between the two. This shows that military spending itself may have a negative effect, but if it is complemented by arms exports, that spending turns favourable for GDP. Hence, it is clearly evident that arms exports were not only

good for GDP level and growth, but it also makes the military spending favourable to economy. Hence, results imply that for developed countries, military spending in the presence of arms export is an effective foreign policy tool in securing economic growth, maintaining political stability and strong rule of law.

India Pakistan & China. Another study on 'Effect of military expenditure on economic growth: evidences from India, Pakistan and China using cointegration and causality analysis' by Mohammad Hasan Raju & Zobayer Ahmed revisited the existing evidences of India, Pakistan and China with updated data on the effect of military expenditure and economic growth. Econometric approaches analysed the short and long run relationship between GDP growth and Military expenditure. The study obtained positive log-run relation, no short run relation and unidirectional long run causality in every case, but for different degrees of relationship. The study got positive long run relationship and long-run causality from military to GDP growth at 5% level of significance, but no short run relationship for all the three countries, though the degree of relationship between variables are different from one another.

India Specific Studies. A detail study on 'Military Expenditure and Economic Growth: the case of India' by Abdel-Khalek, G. Mazloum and El Zeiny, uses time series approach, and Hendry General-to-Specific (GTS) modelling methodology, to examine and analyse the relationship between military expenditure and economic growth. India is one of the most important developing countries that has high levels of military expenditure and a sizable military industry base.

Methodology. On the practical side, most of preceding research on the relationship between the two variables 'military expenditure and economic growth', disregarded the importance of interrelations between the civilian and military sectors. Most of these studies used cross-sectional analysis, using a sample consisting of many

countries, which assumes generalising the results to all countries in the used sample, despite the differences between these countries in structure of economy and military expenditure attitudes. In the Indian case, research in relationship between military expenditure and economic growth had three cases: -

(a) Military expenditure boosts economic growth.

(b) Economic growth enhances military expenditure.

(c) No causality relationship between the two variables.

Military Expenditure Boosts Economic Growth. Some studies investigated relationship between the two variables dealt with Indian case as part of a group of countries, using panel data analysis. Dealing with Indian case, applied on South Asia region countries using panel effect model and data for five South Asian Countries ie Sri Lanka, Pakistan, Nepal, India, Bangladesh, the results revealed a positive relationship for the group as whole from military expenditure to economic growth. In the case of India, the results revealed a bi-directional causality between military expenditure and economic growth. But in the case of Pakistan, causality was from economic growth to military expenditure, and no evidence of causality from military expenditure to economic growth.

Economic Growth Enhances Military Expenditure. Study examined the relationship between economic growth and military expenditures in five countries: United States, Russia, Japan, India and China, during period 1988-2013. The main result was that economic growth tended to increase military expenditure, as well as military capabilities.

No Causality Relationship. No causality relation between the two variables, relationship between military expenditure and economic growth in China, India, Nepal and Pakistan, using cointegration analysis were investigated. The long run

relationship between military expenditure, economic growth and public debt were identified in a cointegration framework. The most important result was absence of the causality from military expenditure to economic growth in India. Study examined affordability of India's military expenditure, to see if military expenditure hinders or boosts economic growth. The results revealed that although the growth of military expenditure did not boost economic growth, it also did not hinder it. The absence of causal relationship between the two variables, military expenditure and economic growth in Indian case, during period 1980-2016 was noticed. The results also revealed that there is Granger causality from government expenditure and exports to economic growth. In light of these results, study reached the following conclusions :-

Arms Exports - Indian Context. First, the continuous regional tension is the main factor behind adopting Indian military strategy and supporting military capabilities. India realised the importance of the strategic and economic dimension of military industries, trying to achieve self-sufficiency for its armed forces as an objective. India has tried to increase military exports, which have become one of the most important factors that cause economic growth, as concluded above. It may be suggested that military expenditure indirectly enhanced economic growth.

Collateral Growth. Second, despite the absence of direct role of military expenditure on economic growth, the Indian military industry has supported Indian development and economic growth through technological spill over to the civilian sectors, thereby raising productivity and enhancing growth.

Self Reliance. Third, several factors and activities have contributed to the development of Indian military manufacturing and increased interactions/linkages with civilian sector. The most important of these activities are R & D, and self-reliance, as an objective to manufacture basic components & electronic systems.

These factors and activities also enhanced civilian industry and export levels, by getting the marketing rights of foreign military equipment/systems, manufactured and produced in India via licenses.

Technology Bottlenecks. Fourth, there are still major difficulties in the interactions between Indian civilian and military sectors. The most notable difficulties are the inability of civilian industrial sector to produce certain materials for military industries and the small scale of production, which lead to higher production costs. Despite these difficulties, the Indian military manufacturing and scientific policies have achieved self-sufficiency for some of India's military needs.

Strategic Government Partnerships. Fifth, India was able to participate with other countries in some of strategic industries. Such participation contributed to the integration of the civilian and military sectors. The most important of these industries are space & aeronautics industries, such as satellites and missiles. These industries are in co-operation with foreign military companies and groups, particularly those located in USA, Europe, and Israel. Such partnerships give strength to the linkages between civil and military industrial sectors. Thereby, India has been able to make real benefits to its national economy.

Frameworks Incentivising Indenisation. Sixth, the most notable being the Indian military manufacturing policies where India has steadily walked towards the objective of self-reliance, by becoming one of few nations that possess and develop advanced military equipment. However, it has continued a long-standing policy of support from the technologically advanced countries for its military capabilities. Indian Government also gave rights to private sector and foreign direct investment (FDI) for manufacturing and producing in military industries, strengthened linkages with the domestic producers, and giving full marketing rights to the Indian government. These

policies considered a great move towards deep changes for Indian military manufacturing policy.

Finally, military expenditure in India is a broader phenomenon, and further research is needed, particularly in analysing the linkages between military and civilian industrial sectors and determining the sectors of Indian economy that are more sensitive to military expenditure. Such research will help determine the channels of military expenditure that indirectly influence economic growth in India and better explain the causality between military expenditure and economic growth.

CHAPTER 6

Infrastructure Development in Border Areas & Dual-Use Infrastructure

Intangible Deliverables. Significant contribution of Services exists towards nation building. However, a large number of these factors where services contribute are intangible in nature. Considering the span of the activities overseen by the Services, not all actions which contribute towards growth can be quantified. It is relevant that though these activities are intangible in nature, their impact on national economy is tangible and have been highlighted. Major factors are listed below: -

- **Border Area Development**. Infrastructure development in border areas, revenue to the local economy and impact on civilian population have a significant services contribution (twenty-six National Highways totalling 5552 kms). Border Roads Organisation (BRO) is executing flagship programs outside the country too (road in Afghanistan, rehabilitation of airfield in Tajikistan, Tamu- Kalemyo-Kalewa road in Myanmar and construction of roads in Bhutan).
- **Dual Use Infrastructure**. UDAN (Ude Desh ka Aam Naagrik) scheme plans to expand the civil aviation network by activating dormant airfields and utilising existing 49 military airfields. IAF is a major stakeholder in these dual use infrastructure projects which also include dual use helipads for helicopter operations and landing airstrips. Island Development Agency under the Home Ministry & NITI Aayog had shortlisted 26 islands for various development projects for transforming islands in Andaman & Nicobar and Lakshadweep.
- **Technologies Impacting Growth (Dual Use)**. Science & Technology investment programs in India target a range of high-impact technologies like Information technology (IT), telecommunications (from microchips to supercomputers), nuclear energy, alternative energy, water purification, ocean exploration, space,

biotechnology, agricultural science, and green technologies, which can propel strong economic growth for the country.

Infrastructure - Border Areas. Development of strategic road, rail links and airfields in border areas has been considered (almost at 100%), as Services directly contribute to enhancing connectivity to remote areas and are leveraged by the civilian population, in addition to their strategic context. Likewise, Op Sadhbhavna budget directly stimulates the local economy and creates infrastructure at grassroots level (considered 100%). Budget elements contributing to infrastructure development are: -

- Infrastructure Development in North Eastern Region
- Construction of Rohtang Tunnel
- China Study Group (CSG) Roads
- Strategic Rail Project (14 links)
- North Eastern Project (IAF)
- Projects in Andaman & Nicobar Islands

Significance : Border Infrastructure[23]

- Improving Trade with Neighbouring Countries such as trade through Attari-Wagha border and Border Haats with Bangladesh, Nepal, Bhutan, etc.
- Check Smuggling. Proper border road infrastructure will reduce trafficking/ smuggling, which is currently a big cause concern for India and neighbouring countries. Examples of it are cattle smuggling on India-Bangladesh border, arms smuggling on Indo-Nepali border and drugs smuggling on Indo-Pak border.
- Inclusive Growth and Development. Border road infrastructure, especially in harsh terrain such as northeast and Jammu & Kashmir provides avenue for self-employment and boost to traditional small-scale Industries.

- Tourism in Himalayas has not reached its full potential due to improper road infrastructure, we must improve our border road infrastructure to boost tourism.
- Soft Power Diplomacy. One of the advantages is that through border road infrastructure, India will be successful in pushing the ambitious neighbourhood first policies. It will act as soft power in terms of creating people to people contacts. Best example of this is the most recent project of Kartarpur Corridor.
- Maintaining Peace and Stability. India faces threat of a two front war due to unconventional warfare by Pakistan and muscle flexing by China. Border road infrastructure helps in maintaining peace and stability by controlling the security concerns related to inter-region and intra-region issues, such as terrorism, insurgency, external aggression etc. For example, Atal Tunnel will enable India to rapidly deploy troops and equipment to Ladakh. In 2019 India opened Darbuk-Shyok-Daulat Beg Oldi road connecting to a strategic airstrip at DBO, close to the Chinese border in Ladakh. 30 bridges have been commissioned in 2019 alone, on the route to the LAC from Ladakh to Arunachal Pradesh.
- National Integration. The task of national integration which started with independence of India and still going on will be incomplete without border road infrastructure. Connectivity and inclusivity are the important tools for national integration to far-flung areas such as North Eastern states & Ladakh.
- Disaster Management. Another important advantage of border infrastructure is swift disaster management. Difficult and harsh terrain of Indian borders and relatively low development of bordering countries make it inevitable for India to be prepared and self-sufficient to handle any type of disaster.
- Experience. Without strong border infrastructure, our military establishments becomes ineffective. For example, during the Kargil War, Srinagar-Leh highway

was targeted by Pakistani troops as it was the most important route connecting the two regions, which further connects Siachen. There is another through the Rohtang Pass but remains closed half the year due to snow. Therefore, it is of utmost necessity to open alternative routes.

Infrastructure - BRO

The organisation primarily meets the defence requirement towards infrastructure development of remote Border areas of North & North East states. The infrastructure development includes Roads, Bridges, Highways, Airports, Tunnels, Buildings and other structures. Apart from strategic / defence requirement, the roads also cater for the socio-economic development of the nation. Border Roads Organisation has contributed a lot in socio economic development of North East region. BRO maintains lifelines of Sikkim, Bhutan, and Aman Setu near Kaman Post, Arunachal Pradesh, Mizoram, Manipur, Nagaland, Tripura, Meghalaya, Jammu & Kashmir, Uttarakhand, Himachal Pradesh and Andaman & Nicobar Islands.

BRO is engaged in road construction to provide connectivity to difficult and inaccessible regions in the border areas of the country. The BRO operates and maintains over 32,885 kilometres of roads and about 12,200 meters of permanent bridges in the country. Work by BRO on critical border infrastructure such as roads and bridges has gone up by nearly 75% across seven states and union territories sharing borders with China and Pakistan in the last two years[24].

Maintaining National Highways. BRO is upgrading and maintaining twenty-six National Highways totalling 5552 kms spread across the North, North Eastern and Central part of India. This upgradation includes the double laning of various stretches of the National Highways across the length and breadth of the country. Four laning of National Highways where other agencies fail is being given to BRO.

Special Development - North East. Ministry of Shipping, Road Transport & Highways, and Government of India has approved special accelerated road development programme (SARDP) under which all district HQs of North Eastern states are to be connected with double lane roads with state capital. Out of the total 32 routes under this scheme, BRO is to complete 12 routes under Phase-A and 20 routes under Phase-B. This caters for 498 Kms of roads in Phase-A and 2200 Kms of roads in Phase-B planned for improvement.

Projects Under Execution. BRO is currently executing/executed flagship projects outlined below, both inside and outside India: -

(a) Construction of 9 Kms long Rohtang or Atal Tunnel and related access roads to its portals with cost of tunnel Project being over Rs 1000 cr. The world's longest highway tunnel (9.2 kms) connecting Manali to Lahaul-Spiti cuts time by 4-5 hours and will be open throughout the year. Earlier, this route was closed for six months due to snowfall.

(b) Four laning of 17 kms stretch National Highway- 1A Vijay Pur- Jammu , part of North South corridor.

(c) Completion of 638 m long Naodhing Bridge on National Highway-52 in Arunachal Pradesh, the longest bridge constructed by the organisation till date. Completion of 480 m long, 8 spans box girder bridge completed by BRO by using departmental resources, without involvement of contractors.

(d) BRO has rehabilitated the runway along with other auxiliary works like construction of aprons, ATC buildings and other facilities in Tajikistan in a record time of 10 months at a cost of Rs 50 crore.

(e) Construction of 219 kms long highway along Western border in Afghanistan is in progress. Construction and maintenance of roads in Bhutan and 160 kms long Tamu- Kalemyo-Kalewa road in Myanmar.

(f) Sela Pass tunnel in Arunachal Pradesh and the Daulet Beg Oldie-Shyok-Darbuk Road. The reasons for the Galwan Valley clash was rapid Indian progress on this road.

(g) Bridges. Project Sampark has achieved 1200 m bridge targets in 2019-20. BRO has completed 44 of the 102 bridges under construction for the year 2020 where 10 bridges were built in eastern Ladakh alone. Example: Daporijo Bridge over the Subansiri river, connecting Assam to Arunachal.

(h) Latest Austrian technology has been used in Chamba tunnel, a major link of Chardham project. BRO has been entrusted with 251 kms of the Chardham project and consists of 17 packages out of which 10 projects of 151 km have been sanctioned.

(j) BRO recently completed a strategically crucial road from Dharchula to Lipulekh, popularly known as Kailash Mansarovar Yatra route. The newly built 80-km road connects the Lipulekh Pass at a height of 17,000 feet along the border with China in Uttarakhand with Dharchula. The arduous trek through the treacherous high-altitude terrain can now be avoided by the pilgrims of Kailash Mansarovar Yatra and the period of journey will be reduced by many days.

Other Initiatives

- Work in Foreign Countries. Construction of the Delaram-Zaranj Highway in Afghanistan in 2008. The Farkhor and Ayni air bases of Tajikistan were also restored and repaired by the BRO.
- CIBMS (Comprehensive Integrated Border Management System) is electronically surveying some parts of the border. CIBMS recently inducted on a pilot basis

is BOLD-QIT (Border Electronically Dominated QRT Interception Technique) at the Pakistan (10 kms) and Bangladesh (61 kms) borders. This system will monitor unfenced riverine areas of Brahmaputra and its tributaries, thus reducing problems of illegal migration and smuggling from Bangladesh. Entire Brahmaputra has been covered with data network generated by microwave communication, OFC cables, DMR communication, day and night surveillance cameras and intrusion detection system, giving feed to BSF control room for Quick Reaction Teams to thwart any illegal activity

- Border Area Development Programme (BADP) has been implemented through 17 States which constitute the International Land Borders. BADP schemes include construction of primary health centres, schools, supply of drinking water, community centres, connectivity and drainage to enable sustainable living in border areas.
- Surveillance and Intelligence. Up-gradation of intelligence network and co-ordination with sister agencies, conduct of special operations along the border. Vulnerability mapping of entire border has been made a continuous process based on which sensitive spots are identified and adequate measures are taken to further strengthen security in these spots.

Dual Use Infrastructure: Airports/Airstrips

A large number of military airfields in the country have regular operations by civil airlines like Jodhpur, Jamnagar, Pune and Chandigarh. IAF extends its support to civil flights operating from its airbases around the country. The UDAN (Ude Desh ka Aam Naagrik) scheme plans to expand the civil aviation network in India by activating dormant airfields and utilising existing 49 military airfields. This also helps military aviation by increasing the number of active airfields that can be utilised by military

aircraft with minimal additional equipment/resources. IAF has operationalised several airfields in the hitherto inaccessible border regions of the country, including those at Ziro, Along, Mechuka, Walong, Passighat and Tuting in Arunachal Pradesh.

Emphasis is being given for civilian aircraft movement and strengthening of 50 airstrips that are predominantly along the India-China border. Such airstrips could have a dual use and can be used by military aircraft that need only short runways. The support for infrastructure development would seek to connect unreached areas, as well as places where structural work is on, such as Tezu in Arunachal Pradesh. The Centre is building 17 highways in border areas that can be used as airstrips for the Indian Air Force (IAF). Using highways as an alternative landing strip has relevance not only during war, but also during natural calamities. States could speed up their disaster relief operations if such highways are close to the disaster locations and highways could act as an advance landing ground.

The IAF has been a part of the Indian aviation ecosystem both as an operator as well as the recipient of manufactured products. IAF was also the first indigenous manufacturer of a transport aircraft when it established a production line to indigenously manufacture the 45 seater "Avro HS-748" transport aircraft. This manufacturing process was later transferred to Hindustan Aeronautics Limited (HAL) and this production line became the HAL Kanpur division. This aircraft manufacturing capability underwent a further expansion in 1983 with HAL Kanpur division undertook licensed manufacturing of the 19 seater Dornier (Do)-228 aircraft, primarily for meeting the needs of the Armed forces.

Island Infrastructure

The 572 islands of Andaman and Nicobar, form India's south-eastern border. While the northern most part of the archipelago is only 22 nautical miles away from

Myanmar, the southernmost point, called the Indira Point, is a mere 90 nautical miles from Indonesia. These islands dominate the Bay of Bengal, the Six Degree and Ten Degree channels where more than 60,000 commercial vessels traverse each year. Nine major bottlenecks that control entry to this region are the Malacca Strait and the Six Degree Channel. The Andaman and Nicobar Islands lie in this strategically important zone, that India with its growing naval capabilities could play a significant role in controlling access. India has deployed naval assets to the islands, for surveillance in important sea lines of communication[25].

China's investments in the China-Pakistan Economic Corridor (CPEC) has reached $62 billion from the initial allotment of $46 billion. This demonstrates the level of concern China has on securing a passage to the Indian Ocean bypassing the Strait of Malacca. The 'Malacca Dilemma' has gripped China ever since it became apparent that a potential conflict involving itself would lead to its adversaries closing the strait, denying access to much needed energy resources and trade.

Therefore, China has tried opening a land corridor through Myanmar to reach Bay of Bengal, but the projects have faced delays/closure. China found Pakistan to be favourable given its long-standing enmity with India and the geographical advantage of opening to the Arabian Sea. China has already built a naval base in Djibouti allowing it to link with Gwadar in Pakistan for securing its interests in the Indian Ocean. China's reliance on the Strait of Malacca is not going to dwindle even if CPEC is completely operational. In addition to the volume and feasibility concerns of transporting goods across CPEC and Western China, most of the developed areas lie on China's Pacific coast and its seaborne trade is rising. India can use these islands to project power into the region and signal to China's about its readiness to counter any intervention. Andaman and Nicobar Islands also form an important element of 'Act

East Policy' of engaging with countries in the region and support India's larger geopolitical interests.

Island Development Agency under the Home Ministry and NITI Aayog had shortlisted 26 islands for various development projects for transforming the islands in Andaman & Nicobar and Lakshadweep. Development plans with a focus on creation of jobs for the islanders through tourism promotion as well as export of seafood and coconut-based products made in the islands is being implemented in four islands of Andaman and Nicobar Islands and five islands of Lakshadweep. The proposed airports in Great Nicobar island of Andaman and Minicoy island of Lakshadweep would catalyse the development process in the region.

The focus on building critical infrastructure in islands region is having a positive domino effect, as infrastructure and connectivity get further strengthened. The tourist hotspots have spurred economic activity and lifted many people out of poverty. Port Blair and another seven islands in Andaman would get digitally connected through submarine optical fibre cable by June 2020. The government has improved communication and access to islands, which will enhance trade and tourism across the islands. This has facilitated setting up of information technology and led to rising of the indigenous Micro, Small and Medium Enterprises (MSMEs) in islands. The tri service command has played a key role in implementation of the above measures.

Dual Use Technologies. Almost all major inventions and innovations owe a lot to warfare. Radar, Sonar, communication equipment, computers, wireless, missiles, rockets, air transportation and countless other technologies/ processes have their origin in defence labs and battlefields. Science & Technology investment programs in India target a range of high-impact technologies like Information technology (IT), telecommunications (from microchips to supercomputers), nuclear energy, water

purification, ocean exploration, space, biotechnology, agricultural science, and green technologies, which can propel strong economic growth for the country.

Contribution to UN. India today is the largest contributor of troops to UNPKOs. More than 200,000 Indian troops have served in 49 of the 71 UNPKOs deployed so far. The large troop contribution reinforces India's claim for a Permanent Seat when the UNSC is expanded. Besides, it provides handsome monetary compensation and international exposure to soldiers. Even the equipment/vehicles on wet lease for troops gives foreign revenue to the Indian government. It also accrues a lot of goodwill for India on the global stage, especially in oil and mineral rich Africa. India's claim to a permanent seat on the UN Security Council is buttressed by claims about our peacekeepers, who have been huge assets for promoting safety and normalcy in war ravaged countries. Thus, UN troop contribution not only brings foreign exchange for the country, but additional pay also earned by soldiers gets ploughed back into the economy and adds to the GDP. The troops have carried out several major operations in defence of the mandate and in the interest of world peace.

Employment Generation - Services.

- Employment in Schools/Colleges. Services operate over 137 higher secondary schools, 249 pre-primary schools and 11 professional institutes of higher learning for over 2.3 lakhs students. These schools employ over 8500 teaching and non-teaching staff.
- Hiring of Casual Labour. Creation of over 12,000 jobs through hiring of casual labour across India who are paid either through Regimental defence funds or the defence budget.
- Skill Development through 'Skill India' Initiative. To give impetus to the national initiative of the "Pradhan Mantra Kaushik Visas Yojana (PMKY)', Services are

imparting necessary reskilling required by the retiring personnel to integrate into civil society. Till date over 21,000 personnel have been trained under PMKY specified guidelines.

- Youth Empowerment. 31 Youth Guidance Employment Nodes have been established by the Army in J & K under Operation Sadhbhavna to create awareness about job opportunities, competitive exams, vocational training and to enable them to work as mechanics, machine operators, animal husbandry, poultry farming etc.

Protecting Environment. Territorial Army (TA) has an Ecological TA unit which has arrested man made environmental degradation by planting approximately 16.63 Cr trees over 15,095 hectares of land since 2012.

It is relevant that ibid impact is through the Defence Budget which gets ploughed back into the national economy. Thereby, it is important to realise that defence budget has an important multiplier effect on the national economy.

CHAPTER 7

Efficacy & Effectiveness of Defence Budget

Pitfalls -Defence Architecture. The problem with national security issue in India is that not many people in government want to get involved into it and political leaders tend to shy away from major discussion on security issues. This is reflected in parliamentary debates where rarely any debate has taken place on defence budget or matters related to national security, except during periods of wars or terrorist attacks like Parliament attack or Mumbai 26/11 incident. No focused thought is given to national strategic security and neither a periodic defence review undertaken to craft a strategy for the force levels needed to safeguard national interests.

Another problem is that neither the political leadership nor the bureaucracy has tried to ever enunciate a national security policy or doctrine. The strategic priorities that should drive the building up of military capability in military modernisation have never been articulated. The guiding beacon for the defence forces is the defence minister's directive, but it falls short to guide future acquisitions or force structures. This obviously affected priorities and fund allocation for defence forces. In the absence of clearly articulated long term national security strategy and defence policy, it is not possible to draw up doctrines, force structure/postures and capability building of the defence forces. A well enunciated National Security Doctrine provides a comprehensive picture of country's perspective on strategic issues and leads the planners for future gazing.

Defence Plans. Despite several years of efforts, defence planning in India is characterised by bouts of heightened activity followed by long periods of relative inaction. [26] Five-year defence plans have rarely been formally approved before commencement. Ad-hocism is the order of the day, leading to knee-jerk responses

and haphazard planning, making India a reactive rather than pro-active nation in matters pertaining to national security. Whenever India's major adversaries plan big defence purchases, there is an outcry for similar acquisitions, resulting in piecemeal decisions regardless of long-term impact. The other problem of Indian defence forces has been structural since all three Services roll out schemes after schemes. As a result, the acquisitions as well as growth of the defence forces are based on the requirement as perceived by each Service. The Service Long Term Integrated Perspective Plans are not based on budgetary support, since there is no long-term commitment of funds from Finance Ministry and funds have not been forthcoming to meet the demands. All three Services have made 13th Five-Year Defence Plan 2017-22, which envisages an allocation of Rs 26,83,924 lakh Crores including Rs 13.95,271 lakh Crores under revenue. A plan without any firm commitment of budgetary support remains an academic exercise and Services will continue to process the stand alone demands neglecting all round capability development. Considering the size of the government expenditure and competing demands, this kind of allotment may not be feasible. The backlog of defence schemes on account of procedural and decision-making problems amount to more than three lakh Crores[27].

Budget Formulation. The system of budget formulation is based on the Forecast Estimates (FE) submitted to the Ministry Defence, Union of India in the month of Nov of the previous year by each Services HQ. The FE is followed by projections for the Budget Estimates (BE) in Dec. Since there is no clear defence policy, each Services HQ caters for approximately 10% inflation and the BE is forwarded for consideration. It is told that the budget process as it has evolved in India, usually depicts the resources available for development after providing for all essential non-plan outlays, including the demands of the Defence Ministry. Inevitably, it is

interactive process between the Defence Ministry and the Finance Ministry. The demands of defence are pared down to the extent possible at the bureaucratic level. Ultimately the defence budget is not decided by strategic considerations but whatever little can be allotted within the confines of fiscal constraints.[28] The defence budget is worked out on an ad-hoc basis to cater for routine expenditure and meet some of the capital expenditure including infrastructure development on yearly basis. There is complete lack of long-term capability building based on our security requirements.

Drawbacks - Defence Budget. Budget is a statement of policy and is inherent that it should have a long-term perspective. Government budgets world over are the vital policy instruments to guide a nation about the future. Defence budget should be a basis for integrating strategy, force structure and costs involved but it has remained divorced from strategy and two are independents entities. They are carried out by different people and not dependent on strategic considerations like which weapon to buy but is dependent upon the financial allocation. The strategy and force structuring are considered the forte of defence forces, whereas budget formulation is considered a civilian bureaucratic exercise. There is no meeting ground between the two and the gap between the two is a serious hurdle to rational defence planning. In India, the main concern of the MoD seems to fit the military requirements to a predetermined budget. This is more so because to achieve the overall defence capability is a long drawn complex process. The calculation/estimation of budget largely remains an arithmetical exercise. There is no firm commitment of funds except for a year to ensure the yearly expenses, especially for capital acquisition since number of proposals remain pending. In India defence budgets are rarely explained in detailed, rather customary mention exists in the budget speech. The budget rather than being a mechanism for integrating strategy, force structure and expenditure has become an

allocation process. The defence budgeting system in India has remained incremental in nature and does not indicate outputs. Yearly allocations of funds are made without reference to defence plans. In effect, the budget does not get linked to established goals/outputs. Resources planning beyond a one-year period is not carried out.

Capability Based Approach

A different approach that could be used for force requirement is the capability-based approach. However, in India the problem is the defence forces make their capability plan in vacuum, in the absence of any conceptual basis for determining needs based on National Security Strategy. Secondly the issue in such an approach is that the individual Services makes standalone capability build up plan without reference to the threats or long-term vision. In India Defence Secretary is responsible for the defence of the country. Neither he nor the defence minister has ever enunciated the long-term vision or defence capability plan. No government has laid down National Security Strategy which can be used as a guiding parameter to affect the capability of each Service. To lay down capability plans for the forces means not only committing funds as per capability build-up but also the accountability on the security front.

In India, we have not been able to evolve force, procurement, manpower and readiness plans in sync with defence expenditure. Capability building is based on the assumptions on what to accomplish militarily. The defence forces require huge investments, however a long-term planned defence effort is more cost effective than spasmodic spending on case-to-case basis without being part of overarching strategic requirements.

Defence to Development Ratio

One interesting but altogether different approach is called the Development to Defence Ratio and has been worked out to calculate the development to defence

ratios. The author benchmarked the human development index of Argentina, Mexico, Brazil, and Sri Lanka. The human development index figures for these nations were 0.784, whereas of India is 0.577. He used it as a benchmark though these countries are poor in comparison to development standards in the rich nations. He used 0.784 as a benchmark and calculated the ideal development to defence ratio for India. He suggested that to achieve the benchmarked human development index the development to defence ratio of India should be 3.76 to meet this goal. The defence to development ratio can be improved by increasing the development spending faster than the defence spending or cut back defence spending. However, such an approach pitches defence spending and development spending against each other[29].

The security threats facing a nation dictates that a country need to spend more on defence and when it does, it does not mitigate the threats, instead it gets into a cycle where the adversary too acquires the matching capabilities, and the county is not safe again with increased threat perception as explained by eminent international relations theorist Kenneth Waltz in Theory of International Politics. Rather than increased well-being, the reward is in the maintenance of their autonomy.[30] What matters is not how much we spend on defence but how we spend and how much is required for making the country more secure. It takes decades to develop the capability of the defence forces since buying the weapon system is one absorbing aspect, but complete exploitation of the weapon with the strategy and tactics is other. How much a country needs to spend on defence cannot be judged by the size of the economy but could be based on multitude of factors such as defence preparedness, capability building and threat perception. Defence spending need to be flexible considering the overall financial situation, demand of other sectors and prevailing security situation.

15th Finance Commission - Defence Expenditure

The 15th Finance Commission has recommended the constitution of a dedicated non lapsable, modernisation Fund for Defence & Internal Security to bridge the gaps between the projected budgetary requirement and budget allocation for capital expenditure on defence and internal security. This may be called Rastriya Suraksha Naivedyam Kosh.

The 15th Finance Commission said that the proceeds of the fund will be utilised for capital investment for modernisation of defence services, paramilitary services and state police forces, and a small component as a welfare fund for soldiers and para-military personnel[31]. The non-lapsable fund recommended by the Finance Commission will be under the Public Accounts and will have four sources of incremental funding: -

- Transfers from the Consolidated Fund of India.
- Disinvestment proceeds of defence public sector enterprises.
- Proceeds from monetisation of surplus defence land.
- 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 Comptroller and Auditor General. The Commission also recommended that MoD should take measures to innovatively bring down the salaries & pension liabilities and reduce dependence on defence imports, with a roadmap. The total size of the proposed Fund for the period 2021-26 is Rs 2.38 lakh crore, with a maximum size of Rs 51,000 crore per annum[32]. Any exceeding amount will be deposited into the Consolidated Fund. The Ministry of Defence would have exclusive rights over the use of the fund, while the Home Ministry will only be permitted to use the fund earmarked for paramilitary forces. The fund may be operated by a suitably empowered High-Powered

Committee headed by the Cabinet Secretary and consist of the Secretaries of Defence, Home, and Chief of Defence Staff.

Modernisation of the defence and internal security apparatus is a continuous process, based on threat perception, operational challenges, and technological advances. The Ministry of Defence has the highest allocation among all Union ministries. Over the last ten years, the defence budget has shown a trend growth rate of 9.6 %. Within this, revenue expenditure has grown at 11 % and capital expenditure at only 6.1 %.

Although as a proportion of gross domestic product (GDP), total defence expenditure has decreased between 2011-12 and 2018-19 (from 2.5 % to 2.1 %), the proportion of total defence expenditure in total Union Government expenditure has increased from 16.4 % to 17.4 % during the same period. This is also in the background of a decline in total Union Government expenditure from 14.9 % of GDP in 2011-12 to 12.2 % of GDP in 2018-19. The increase is largely accounted for by defence revenue expenditure which rose from 12.6 % of the Union Government's revenue expenditure in 2011-12 to 15.1 % in 2018-19.

A non-lapsable and assured source of finance can potentially minimise the spending spree in closing months, particularly the 'March Rush' including parking of funds in PSUs, triggered by apprehension of surrender of funds. In part, it leads to injudicious, hurried expenditure without due scrutiny. The move to create non-lapsable fund will certainly help in improving the expenditure management by Ministry of Defence.

CHAPTER 8

Findings, Recommendations & Conclusion

"At a time when major powers are reducing their forces and rely more on technology, we are still constantly seeking to expand the size of our forces. Modernisation and expansion of forces at the same time is a difficult and unnecessary goal. We need forces that are agile, mobile and driven by technology, not just human valour."

-- PM Shri Narendra Modi, Combined Commanders' Conference

General. National security is a relative matter not without firm criteria, but unless national security objectives are set and a defence policy evolved, there can be no military doctrine or balancing of defence expenditure with national objectives. Priorities such as spending on education, subsidies for farmers, employment generation, medical care etc will have to be provided by the Government. However, resources for national security will have to be provided while maintaining balance between the two. There is no explicit way to arrive at optimum level of defence preparedness or spending as threat perceptions are dynamic and emerge abruptly. Though tying of defence expenditure to GDP may not be prudent, it does provide a reference to study the expenditure of government finances, especially defence forces.

Pattern in Defence Expenditure.

- There is a definite pattern in defence expenditure. Almost 80% of the respondents in the study Questionnaire have said that there is a definite pattern in the defence budget allotment and expenditure.
- The growth of 9.4 % in MoD's overall allocation this year follows the pattern of annual average rate of 9%. Our Defence budget has consistently increased from 3,000 crore in 1980 to 2.8 lakh crore currently. Over 40-year period, it has grown at ~12% Compound Annual Growth Rate (CAGR), with growth rates slowing down off lately.

Defence Budget Percentage of GDP & CGE

- Almost 84% of the respondents in the study Questionnaire felt that the percentage allocation of Defence budget should at least be 2 to 3% of the GDP.
- There is a steady decline over the years of Defence Services Estimates (DSE). Implication is that increase in Defence Budget has not kept pace with increase in GDP. While in absolute terms, there is a marginal increase, this increase is not commensurate to overall increase in GDP or CGE. This is also inadequate for modernisation. The defence budget has fallen below 2% of GDP, as per available data. Even the defence expenditure in absolute terms over the last 10 years has fallen from 2.9% to 2.4% of the GDP. The percentage of defence expenditure with respect to GDP has been highlighted in the Chart 3.4 in Chapter 3.

Allocation of Budget for Defence Services.

- Almost over 58% of the respondents in the Questionnaire felt that the budget allotment was only partially adequate, whereas 23% felt it to be inadequate and 19% felt that it was adequate to a large extent.
- MoD's gap between resource requirement and allocation, narrowed from a high of 27% in 2013-14 to 14 % in 2015-16, has increased to 30% in 2018-19 and 25% in 2019-20. The shortfall in projected requirements has shot up from 11% in 2011 to 36% last year.

Analysis -Defence Budget. When the defence budget is situated in a longer time frame and analysed for trends, the following aspects emerge: -

- Inadequate budgetary allocations with respect to planned projections (amplified in Chart 3.3).
- Capital budget is barely sufficient to meet Committed Liabilities leaving insufficient funds for modernisation (amplified in Table 3.4).

- Stabilisation of Pensions and Revenue Budget has occurred. There will now be greater fiscal space for Capital component of the budget.
- Exemptions from Customs duty of direct imports by MoD was withdrawn in Finance Bill of 2016-17. Additional levies on defence imports will be Basic Customs Duty (5 to 10 %), Countervailing Duty of 12.5% and Special Additional Duty of 4% (a total increase of approximately 18.5 to 29.74%).
- GST promulgation has increased tax on defence related items being repaired/overhauled by DPSUs and OFB to 18% or an increase of 6%.
- Introducing a 15% year on year increase in Services capital budget would meet Services requirement for modernisation.

Tangible Contribution

Revenue Budget: DSE. Revenue budget of the DSE is primarily meant for Force Sustenance. When the individual line items of the Revenue budget are analysed, following aspects emerge: -

- Total contribution of Services by Direct Taxes (Income Tax) is Rs 10798.98 Crs (Army: Rs 8962.37 Crs, Navy: Rs 31.86 Crs and IAF: Rs 1518.01 Crs)
- Total contribution of Services by Indirect Taxes (Income Tax) is Rs 110091.90 Crs (Army: Rs 103766.12 Crs, Navy: Rs 103766.12 Crs & IAF Rs 4635.95 Crs)
- Indirect Stimulus to National Economy by Services is Rs 28534.83 Crs (Army: Rs 24271.38 Crs, Navy: Rs 19572 Crs and IAF: Rs 2306.24 Crs).
- Total Contribution from Revenue Budget of Ordnance Factory Board is Rs 4829.47 Crs.
- Total Contribution from Revenue Budget of DRDO is Rs 4104.09 Crs
- Total Contribution of DSE to National Economy is Rs 158359.26 Crs or 48.84% of Revenue Budget of DSE.

Capital Budget. Total Capital component of DSE as per MoD handbook for FY 2019-20 is Rs 26,43,707.78 Crs. The overall contribution to nation of each service has been quantified below: -

- Total Contribution to the Economy from only Capital Services Budget in DSE has been quantified at 28%.
- Offsets accrue to the Indian PSUs and Private Industry including MSMEs through 53 schemes. Ibid offsets (normally 30% of full contract value) are typically channelled to the local ecosystem through the entire contract period (approximated to fifteen years). Appendix data (not shared) reveals that approximately Rs 2436.30 Crs per year will be channelled back to the Indian ecosystem (assuming 100% compliance).

Expenditure Allocation -Modernisation

- Almost 56% of the respondents in the Questionnaire felt that the efficacy of capital expenditure for meeting the modernisation needs was less than 50%, while another 26% felt that it was adequate to meet only 50 to 70% of the modernisation requirement.
- Over the last ten years, capital outlay has consistently reduced from about 45% to 34%. The committed liabilities have increased from 60% to 92%, thus leaving barely 8% for new procurements. The budget 2020-21 has set the highest ever capital expenditure outlay by earmarking funds for capex. It is a 19% increase in Defence capital expenditure compared to last year's allocation of Rs 1,13,734 Cr.

Defence Budget Impacting Growth

- It is observed that a total of 40.09% of the consolidated DSE (both Revenue and Capital) is being ploughed back towards nation building (28% of Capital Budget & 48.8% of revenue Budget).

- Almost 31% of the respondents in the Questionnaire felt that 10 to 20% of the defence budget got ploughed back into the economy. An additional 24% felt that the plough back effect was from 20 to 30%, whereas 25% felt it was 30 to 40%. Only 20% felt that the plough back effect into the economy with respect to Defence budget was less than 10%.

Make in India - Engine of Growth

The government of India came out with 'Make in India' programme. The requirements of Indian defence forces for imported equipment will make it expensive, considering the high costs involved in design & development and limited quantity required. Make in India will bring down costs of weapon and equipment imports if it takes off in areas of defence exports. The government need to provide incentives to the industries involved in the design and development of key weapon platforms.

According to Stockholm International Peace Research Institute (SIPRI), Indian arms imports have come down significantly (by 32%) since 2015, indicating that the 'Make in India' initiative is gaining ground. Reforms in the defence sector like formulation of an import negative arms list with dedicated budgetary provisions, increase in FDI limit to 74%, corporatisation of OFB, establishment of defence corridors etc have taken place. Ibid reforms will leverage existing defence industrial ecosystem to drive up indigenous weapons manufacture and export. It will also propel India into a major arm manufacturing hub in the world.

Defence Exports Impacting Growth

Many countries, including a few developing ones, have been able to maintain a high level of defence expenditure along with economic growth, because they have followed a conscious policy of allowing the defence sector to pay for itself. Many countries like Israel, France, England and USA have shown how defence industry can

support the economy, as also earn revenue through exports of weapons and technology. In our foreign policy posture, export of arms was considered unethical, and no conscious efforts were made to make this a source of foreign exchange earnings or as an influence-augmenting option. In matters of defence production also, the private initiative was not encouraged on the grounds of secrecy, inadequate technical expertise, bureaucratic role and control. The DPSU in India have not achieved technological edge to outbid countries like China who have mastered the art of low-cost production. It would be worth trying to build partnership and co-development of weapon systems to share costs like in the case of Brahmos missile.

India's defence exports have grown over five times in the last four years. The export of military equipment increased from Rs 1,521.86 Crs in 2016-17 to Rs 8,620.59 Crs in 2019-20 and is likely to touch over Rs 40,000 Crs by 2024. This has been possible due to the government efforts in reviewing arms exports policy and streamlining procedures. Private sector companies have been the biggest beneficiaries of the export orders, which has increased their contribution from Rs 194.35 Crs in 2016-17 to over Rs 8013.65 Crs in 2019-20. Approximately 17% of the defence budget expenditure can be recovered through exports. A large majority of the respondents (over 91%) in the questionnaire felt that Defence Exports was a major segment contributing to economic growth, along with defence MSME sector.

Intangible Contribution of Services. Significant contribution of Services exists towards economic growth. However, a number of these factors where services contribute are intangible in nature. Major factors considered are given below:-

Border Area Development. Infrastructure development in border areas, revenue to the local economy and impact on civilian population has been highlighted (twenty-six National Highways totalling 5552 kms). BRO is also executing flagship programs

outside the country too (road in Afghanistan, rehabilitation of airfield in Tajikistan, Tamu- Kalemyo-Kalewa road in Myanmar and construction of roads in Bhutan). Op Sadbhavana budget directly stimulates the local economy and creates infrastructure at grassroots level.

Dual Use Infrastructure.

- The UDAN (Ude Desh ka Aam Naagrik) scheme plans to expand the civil aviation network in India by activating dormant airfields and utilising existing 49 military airfields. IAF is a stakeholder in these dual use infrastructure projects which include dual use helipads for helicopter operations and landing airstrips.
- Island Development Agency under the Home Ministry and NITI Aayog had shortlisted 26 islands for various development projects for transforming the islands in Andaman & Nicobar and Lakshadweep.

Military Technologies Impacting Growth (Dual Use). Science & Technology investment programs in India target a range of high-impact technologies like Information technology (IT), telecommunications, nuclear energy, ocean exploration, space, biotechnology etc, which can propel strong economic growth for the country.

Promoting MSMEs and Powering National Growth.

- MSME sector contributes to 45% of the total employment opportunities/ manufacturing output in the country, 50% of total exports, 29% of the country's GDP (Gross Domestic Product) and 95% of industrial units in the country. The Government plans a contribution of $2 trillion from the Micro Small and Medium Enterprises (MSMEs). In FY 2019, there were 8,643 MSME vendors who were making defence equipment for the government. This number increased to 10,506 till second quarter of FY 2020. MSMEs account for almost 40% of India's industrial production.

- Building Platform Programmes like the K9 Vajra, contribute to the economy with a large multiplier effect and have a significant role in building a defence industrial base. Local production of over 13,000 components per gun system was undertaken through a supply chain of about 500 Indian Tier-1 manufacturers with more than 100 of them from the MSME segment and a total of 1000 MSMEs being involved over four states[33].
- **Defence MSMEs**. An exit strategy for Defence sector post Covid-19 lockdown needs to factor the following: -

  (a) New orders be given only to Indian industry under 'Make in India' and outsourcing increased from defence manufacturing/repair organisations to MSMEs.

  (b) Total moratorium on further imports of defence systems from foreign OEMs.

  (c) Release of payments especially to MSMEs and re-appropriation of appropriate budget for indigenisation.

  (d) Mitigation of working capital stress by way of reduced Bank Guarantees and making capital available at affordable rates.

  (e) Liberalisation of FDI in defence sector be leveraged to enhance indigenous capabilities

Employment Generation. Services generate employment through the following measures: -

- **Reskilling Retiring Combatants**. Imparting necessary reskilling required by the retiring personnel to integrate into civil society. Till date over 21,000 personnel have been trained under PMKY specified guidelines.
- **Employment Generation**. Over 8500 teachers are employed in various schools run by AWES and Welfare organisations of IAF & IN.

- **Defence Related MSMEs**. MSMEs in the defence sector employ nearly Two lakh people directly and Six lakh people indirectly.

Effect - Defence Expenditure on Growth

- Defence Spending Affects Other Social Sectors. 58% of the respondents in the questionnaire disagreed with the aspect that increase in defence spending impacts other social sectors negatively. An additional 24% were not sure and therefore remained neutral, with only 18% mentioning that it impacts other sectors.
- Impact on Economic Growth. 55% of the respondent in the questionnaire said that the defence budget impacts economic growth in a major way and another 35% felt that defence budget had only a minor impact on economic growth. 58% of the respondents also felt that the defence budget has a multiplier effect on economic growth, while 31% were not very sure to confirm this aspect.

Recommendations

National Security Doctrine lays down the foundation on which the defence forces around the world structure their forces. It provided a broader and more comprehensive perspective on the political aims and strategic directions for the defence forces. National Security Doctrine is basis from which flow the National security / defence policy. Even after seventy years, India has not laid down a national doctrine or even a national security policy. There are no clear directions for capability building on where the defence forces should be in next say ten/fifteen years from now.

The lack of a cohesion amongst national security strategy, defence policy and defence budget have many implications. First, it results in the absence of clear political direction regarding politico-military objectives, which is the very basis of sound defence planning. Secondly, there is inadequate coordination of defence plans and economic development. The industrial development and defence production should go

hand in hand to encourage private entrepreneurs in the field of defence production sector. The science and technology policies for defence, R & D and industrialisation should also be coordinated to achieve security goals. A task force needs to be set up like the committee on Defence Expenditure or Kargil Committee to articulate national security policy and provide unambiguous directions to defence forces about their force structure and procurement plans.

Capability & Threat Based

Defence expenditure is a function of the security environment and economic capability of a nation. The security environment would remain volatile in the immediate future, as China continues the path of establishing its presence in the Indian Ocean Region. Defence expenditure of China shows significant increase, while it is not worthwhile to compete with China considering its economic might, but we must upgrade our posture against China. In the backdrop of the strategic developments in South Asia and with the unfolding of 'Belt and Road Initiative' by China, any possibilities for cuts in defence expenditure in India is not recommended.

All defence forces generally always have one third of their equipment nearing its life cycle which need to be replaced. Therefore, the defence forces will consistently seek more funds for modernisation due to the increasing costs of newer technological upgrades. In the prevailing era of strategic uncertainty, the changing nature of warfare demands a judicious mix of threat and capabilities-based forces that can operate efficiently. Defence forces and modern equipment is expensive, and the government must invest in defence forces for the future and this expenditure can be termed as cost towards national security. The defence forces need to be always in mission mode and need to be equipped with the latest equipment. It is this conundrum that makes defence expenditure appears excessive and to some avoidable.

Pensions - Revenue Expenditure. There have been debates about ballooning revenue budget especially due to pay and pensions. The pensions have not increased by virtue of some extra increment but are due to the sheer numbers. The pensions will continue to increase given the increased life span, indexation and now One Rank One Pay. Focus to reduce the revenue expenditure has been mainly on force cuts, procurement cancellations, reductions, and deferrals. No substantial manpower cuts can be affected in the defence forces without affecting operational capabilities.

Almost 60,000 personnel retire only from the Army ranging from 38 to 54 years excluding officers. Such a number will have cascading effect on pensions, which will continue to grow. Instead, government need to change the terms of enrolment for other ranks and laterally absorb them in some of the Central Armed Police Forces, State Police, and other areas. Some have recommended that revolving door system of recruitment be adopted, whereby central armed police force themselves recruit men, send them to the defence forces for training and service for a specified period, and then take them back. This will keep the services young and save exdpenditure.[34]

Operational Research & System Analysis. Many decisions are not based on explicit analysis therefore, rational of major decisions need to be carefully analysed. Decisions on force structure and acquisitions should be based on system analysis. Before identifying weapons and equipment, it is essential to identify the need and alternative methods to achieve the same. After equipment has been identified, there is need to take quick decision, as significant cost escalation happens due to delay in finalising the terms & conditions. A financial plan should outline the risks, consequences, and result of either acquiring or not acquiring such capabilities. Though all three Services including Integrated Defence Staff (IDS) has set up System Analysis offices but are not being exploited fully. Defence forces would benefit as

savings in the budget can be affected due to the system analysis approach by suggesting alternatives. The system analysis in 1962 in fact asked the US Army to upscale the requirement of aircraft during the Vietnam war[35].

Reduction of Non-Combatants. The Indian military's 'tooth-to-tail' ratio stands at about one soldier to 1.15 civilians, when the number should be reversed. There are excessive number of personnel in different departments under the Ministry of Defence. Despite the impressive statistic of having a million plus military, less than half are combat peronnel.[36] India needs to reduce civilian personnel especially in organisations like defence accounts, military engineering Services, Directorate of Standardisation and Directorate of Quality Assurance.

Acquisition Practices. The defence procurement procedure has undergone changes many times but the basic objective of ensuring faster acquisitions has not fructified. Right from Committee on Defence Expenditure by Arun Singh, Kelkar Committee and others including Standing Committee on Defence have repeatedly suggested reforms and faster decision-making process. Minister of State of Defence in his report to the Prime Minister's office has commented that India's weapons-buying is frequently crippled by 'multiple and diffused structures with no single point accountability, multiple decision-heads, duplication of processes, delayed comments, delayed execution, no real-time monitoring, no project-based approach and a tendency to fault-find rather than to facilitate.' Therefore, the process needs to be sharpened and made practical[37]. Decision-making under the present structure would be fruitful only if it has very high-grade multi-discipline staff support.

Alternative Use -Equipment / Weapons. The defence forces buy newer equipment in a cycle. Therefore, instead of discarding equipment we should look for avenues for their alternative use. In this regard, government must step in as inter ministry rivalry

will stall such options. France converted Falcons into maritime surveillance planes. The defence Acquisition Council recently approved purchase of new rifles and light machine guns for the defence forces, it included the demand of Air Force as well and Navy as well. Such a decision may be analysed if alternatives are useful and need to be based on operation requirement. Even within the Army there is requirement to have a relook on Scaling since not all components of the army engage in direct combat. The small arms i.e., rifles, carbines, pistols discarded by the Army could be transferred to not only CAPF, but also police to ensure optimisation.

Efficiency - Defence Expenditure. The defence expenditure needs to be prudent and this is not restricted to the weaponry, but all expenditures. What matters is not how much we spend on defence, but how we spend by cutting wasteful expenditures. The defence forces must ensure efficiency in spending and save on operating costs. The government of India had launched 'GEM' Government e Market, an e portal for day-to-day purchases to bring down cost and corruption. However, due to widespread deployment, the defence forces had to face problems in buying from GEM as number of vendors refused to supply in far flung areas. Localisation of vendors in GEM to supply various government departments according to the geography and streamlining will bring in efficiency in purchases of the defence forces.

Exploit Training Expertise. India has defence co-operations agreements with many countries. Officers and men of different countries train in varied disciplines in India. Singapore each year brings its tanks and personnel to the field firing ranges of Babina for annual firing and training of personnel, since Singapore is a small country and lacks such kind of space. Officers of many other countries undergo training in academies of defence forces. Therefore, India should set up schools of excellence for training of defence forces to friendly foreign countries. An arrangement of such a

nature will not only be revenue earner but also bring down cost of training in other countries in capital intensive areas. There has been proliferation of Central Armed Police Forces (CAPF) and expansion continues. Instead of establishing training facilities for each CAPF, the training capacity of defence forces should be exploited by the CAPF on cost sharing basis. Indian Army is present in almost all states, therefore even the police could train at defence forces institutes.

Restructure Ordnance Factories & DPSU. Ordnance factories have been mainstay of the defence forces since independence. There are 41 factories operating under the MoD's department of defence production and are sole suppliers to the defence forces. An MoD circular has identified a list of 143 'non-core' items, ranging from uniform cloth and sleeping bags to military trucks, that the army could buy from the open market. Corporatisation has been suggested by various MoD-appointed committees, headed by former revenue secretary Vijay Kelkar in 2005 to Vice Admiral Raman Puri in 2016. Therefore, the reforms need to be undertaken to bring in quality and cost competitiveness.

Land Monetisation. There are two aspects of defence forces which need urgent infusion of funds, one is infrastructure development and second is buying modern equipment. The Indian Army is planning modernisation of over 2000 military stations as smart stations in line with the government policy of smart cities but does not have enough money to spend. Therefore, it is important to find the resources outside the budgetary allocations. The defence ministry has a total 17.5 lakh acres of defence land, it will be prudent to go for land monetisation and use proceeds to fund the acquisition of modern equipment and development of military stations. Indian Army has some of the prime estate and some of it can be monetised to fund its requirements. The defence forces in fact have already adopted same kind of model earlier when they

were asked to vacate spectrum for the launch of 2G and 3G mobile Services. Fibre cable was laid to almost all stations of the Indian Army as a compensation and alternate means of communication.

Reforms in Defence Budget.

- Modernisation and capability building of the defence forces are important for security of the nation, which is based on long terms plans, but the present budget system do not link them. The five-year Defence Plans have lost their utility for resource planning. The defence budgeting system must change for capability building of defence forces. The budget focuses on inputs and input budgeting is limited as a means of assessing the efficiency of resource allocation. Performance budget primarily indicates the physical progress of various schemes and programmes in relation to budget estimates. This was introduced by the Government in several Ministries, based on the recommendations of the Administrative Reforms Commission in 1969[38]. Performance Based Budgeting can improve the effectiveness of the defence budget.
- 60% of the respondents in the questionnaire strongly agreed with the aspect of undertaking major reforms in the defence budget and another 39% agreed with the aspect of reforms in the defence budget. Almost 68% of the respondents felt that the defence budget allotment should be based on capability development, while 24% felt that it should be based on the threat perception.

Miscellaneous

- **Defence Infrastructure**. The defence facilities such as airfields, helipads, ports, firing ranges, sports facilities, security consultancy, even the roads built by the Indian Army funds need to be identified that can be used by many civil departments which could be revenue earner for the MoD.

- **Law & Order**. There is a provision that whenever state government seeks help of defence forces whether it is for natural calamities or law and order, the expenditure of defence forces in such situations need to be reimbursed to the MoD. In 2014, the Union government deducted Rs 500 Cr from package of 1,667 Cr to J&K Government to settle the bill of Defence Ministry.[39] Therefore, such money needs to be shown as earning and utilised for capability building.
- **UN Peace Keeping Missions**. India has consistently contributed defence forces to the United Nation's peace keeping efforts. The United Nations reimburses and compensates the expenditure of the force and equipment to the contributing country[40]. Money compensated by the United Nations too need to be shown as revenue earned and should be utilised for capability building of the forces.

Despite a volatile strategic neighbourhood, India is spending much less on Defence as compared to the adversaries, Pakistan and China in terms of percentage of GDP or Central Government expenditure. The recent ongoing standoff with China in Ladakh is a stern warning on the importance of developing a credible military capability. Any neglect in modernisation of the defence forces will be at the peril of security and our standing in the international arena. India should build capabilities to deal with any future threat emanating from China or Pakistan.

There is a need to increase the capital expenditure to undertake effective modernisation. The defence expenditure should be based on overall security situation considering the geo-strategic environment, especially the belligerence of China and equipment holding/deficiency of the defence forces. Higher defence direction missing in the Indian context have started emanating now and need to be institutionalised in a focused manner for achieving economic growth.

Conclusion

India's interim strategy on defence exports should be to focus on non-lethal military equipment and selective medium/ high technology equipment like Brahmos missile, Pinaka, ALH, naval crafts, Weapon locating Radar and Akash Air Defence system. Once 'Make in India' reaches its complete potential, full range of medium / high technology weapons and equipment can be exported, to achieve a target of Rs 50,000 Cr in next five years.

Introducing a 15% year on year increase in the capital budget component would ensure better planning and growth. Stabilisation of Pensions and Revenue budget has occurred, there will now be greater fiscal space for Capital budget, which would further propel manufacturing growth. The initiative for promoting the use of indigenous equipment by defence services has already kick started and needs to be further strengthened. To achieve the goal of building a robust defence industrial eco system and attracting FDI, a five-year indigenous road map be formulated and shared with the industry. This would also favourably impact the 'Make in India'.

Defence acquisitions impact larger strategic partnerships with friendly nations, bring defence/dual use technology and boost indigenous manufacturing. It also attracts FDI, promotes domestic private sector, integrates MSMEs, Start-ups in global supply chains and creates substantial number of jobs. Growing geopolitical/ economic stature, enhancing defence budget allocations and reforming processes for multi domain capability development is a security imperative for India. Forging alliance with partners like the Quad in IOR and securing naval berths in friendly nations like Vietnam, Indonesia, Qatar and Seychelles to counter the Chinese influence has been a pragmatic approach.

A positive relationship between defence spending and economic growth exists for India as military spending provides peaceful environment for investment and production activities to investors. Further, it contributes to economic growth by engaging resources, particularly population, in R & D activities, providing technical skills, educational training and creating necessary infrastructure for sustained level of economic development. Almost 40% of the defence budget gets ploughed back into developing the national economy. The defence budget can therefore be categorised as an important engine for powering national growth and needs to be viewed through this prism.

Appx 'A'

(Refers to Chapter 3 of Study)

INDIRECT CONTRIBUTION OF SERVICES, OFB & DRDO TOWARDS ECONOMY

Ser	Type of Taxes	% of Tax
(a)	Service Tax Rail	3.5%
(b)	VAT on Goods	14.5%
(c)	VAT on Hotel Accn	12.36%
(d)	Service Tax on Food	12.5%
(e)	Sales Tax on Medicines	5%
(f)	Service Tax on Airfare	16%
(g)	Petroleum Products	40%
(h)	FOL	12.5%
(j)	Land Stamp Duty	5%
(k)	Fresh rations	5%

Appx 'B'
(Refers to Chapter 3 of Study)

INDIRECT CONTRIBUTION OF SERVICES, OFB & DRDO TOWARDS ECONOMY

Ser	Category	% of Tax	Ser	Category	% of Tax
(a)	Travelling & Outstation Allowances	100%	(n)	Air Frames & Engines	25%
(b)	Foreign Travel Fares	100%	(o)	Security Related Stores	100%
(c)	Rail, Air Transportation & IWT Charges	100%	(p)	Works (All Types)	100%
(d)	Hired Transport	100%	(q)	Maintenance of Bldgs /Roads/ Infrastructure	100%
(e)	Porters & Ponies	100%	(r)	Payment of rent tariffs	100%
(f)	Military Farms	78%	(s)	NCC	41.2%
(g)	ECHS	100%	(t)	Payment to BSNL	100%
(h)	IT Hardware & Software	100%	(u)	Industrial Est in Naval facilities like Stores Org, Armament Supply Org, Dockyards	100%
(j)	Provisions	100%	(v)	Pilotage & Towing	100%
(k)	ACSFP	15%	(w)	Weapons, spares & eqpt	15%
(l)	Ordnance Factory Stores	25%	(x)	Aviation Stores	15%
(m)	MT Vehicles	25%	(y)	Meteorological Facilities provided by Civil agencies	100%

Note. All payment to Govt agencies like Air India, Railways, BSNL etc have been considered at 100%. All revenue heads translating into Supply Orders to local vendors have been considered at 100%. For Military Farms & NCC, the wages contribution to local economy has been taken as 30%. The above template has been applied to all the line items in these budgets and the total pro rata figures have been quantified at 78% for Military Farms & 41.2% for NCC.

Appx 'C'
(Refers to Chapter 3 of Study)

ARMY : REVENUE EXPENDITURE

Ser No		Particulars	BE 19-20
1		Pay and allowances of Army	867943700
		Charged	450000
2		Pay and allowances and miscellaneous expenses of auxiliary forces	16301400
		Charged	2000
3		Pay and allowances of Civilians	674968000
		Charged	48000
4		Transportation	41933300
		Charged	3000
5		Military Farms	2933200
		Charged	1000
6		Ex-Servicemen Contributory Health SCI	32812600
7		Inspection Organisation	12023500
		Charged	3500
8		Stores	203353900
		Charged	20100
9		Works	83731200
		Charged	40000
10		Rashtriya Rifles	70012500
		Charged	20000
11		National Cadet Corps	16062800
		Charged	10000
12		Other Expenditure	29172600
		Charged	168000
Total Major Head 2076			1443777499
Charged			765600
Total			1444543100 144.45 Crs

Appx 'D'
(Refers to Chapter 3 of Study)

DIRECT TAX CONTRIBUTION OF ARMY

Ser No	Particulars	BE 19-20	Multiplication Factor	Contribution to Economy
1.	Pay and allowances of Officers			
	(a) Pay and allowances of Officers			
	1. Arms	54944049	0.23	12637131.27
	2. Services	39489548	0.23	9082596.04
	3. Others	1913725		0
	(b) Cash Allowance in lieu of free ration to services	1700097	0.23	391022.31
	(c) Pay and allowances of Cadets	3388360	0.23	779322.8
	(d) Deduct -Recoveries on account of P&A of Services	-20000		
	Total Sub Head - A	101415778		22890072.42
	Charged	450000		0
2.	Pay and allowances of other ranks including NCs (E)			
	(a) Pay and allowances of Other Ranks			
	1. Arms	484190256	0.07	33893317.92
	2. Services	200546647	0.07	14038265.29
	3. Others	14025021	0.07	981751.47
	(b) Ration Allowances and Other Misc Allowances			
	1. Arms	29443480	0.07	2061043.6
	2. Services	10174777	0.07	712234.39
	3. Others	702560	0.07	49179.2
	(c) Kit and Uniform Maintenance Allowances - Other Ranks and Boys			
	1. Arms	8106981	1	8106981
	2. Services	2939799	1	2939799
	3. Others	34865	1	34865
	(e) Deduct -Recoveries on account of P&A of Person	-70000		
	Total Sub Head - B	750094386		62817436.87
3.	Pay and Allowances of Recruits	10756481	0.07	752953.67
4.	Release Benefits including payment for Encashment of Leave Salary	5781	0.07	404.67
5.	Leave Travel Concession			
	1. Officers	323	0.23	74.29
	2. Others	4508059	0.7	3155641.3
	Total Sub Head - E	5664169		3155715.59

Ser No	Particulars	BE 19-20	Multiplication Factor	Contribution to Economy
6.	Medical Treatment			
	1. Officers	323	1	323
	2. Others	6784	1	6784
	Total Sub Head -F	7106		7107
Total		86793700 8.68 Crs		89623690.22 8.96 Crs
Charged		450000		

Appx 'E'
(Refers to Chapter 3 of Study)

INDIRECT CONTRIBUTION OF ARMY TO LOCAL ECONOMY

Ser No	Particulars	BE 19-20	Multiplication Factor	Contribution to Economy
1.	Pay and allowances of Officers			
	(a) Pay and allowances of Officers			
	1. Arms	54944049	0.3	16483214.7
	2. Services	39489548	0.3	11846864.4
	3. Others	1913725		0
	(b) Cash Allowance in lieu of ration to services	1700097	0.3	510029.1
	(c) Pay and allowances of Cadets	3388360	0.3	1016508
	(d) Deduct -Recoveries of P&A of Services	-20000		
	Total Sub Head -A	101415778		29856616.2
	Charged	450000		0
2.	Pay and allowances of other ranks including NCs (E)			
	(a) Pay and allowances of Other Ranks			
	1. Arms	484190256	0.3	145257076.8
	2. Services	200546647	0.3	60163994.1
	3. Others	14025021	0.3	4207506.3
	(b) Ration Allowances and Other Misc Allowances			
	1. Arms	29443480	0	0
	2. Services	10174777	0	0
	3. Others	702560	0	0
	(c) Kit and Uniform Maintenance Allowances - Other Ranks and Boys			
	1. Arms	8106981	0	0
	2. Services	2939799	0	0
	3. Others	34865	0	0
	(e) Deduct -Recoveries of P&A of Person	-70000		
	Total Sub Head -B	750094386		209628577.2
3.	Pay and Allowances of Recruits	10756481	0.3	3226944.3
4.	Release Benefits incl payment for Encashment of Leave Salary	5781	0.3	1734.3
5.	Leave Travel Concession			
	1. Officers	323	0	0
	2. Others	4508059	0	0
	Total Sub Head - E	5664169		0

Ser No	Sub Head	Particulars	BE 19-20	Multiplication Factor	Contribution to Economy
6.	F	Medical Treatment			
		1. Officers	323	0	0
		2. Others	6784	0	0
		Total Sub Head - F	7106		0
Total			86793700 8.68 Crs		242713872 24.27Crs

Appx 'F'
(Refers to Chapter 3 of Study)

INDIRECT CONTRIBUTION OF ARMY TO ECONOMY

S No	Nature of Cost		Budget Allotment	Multi Factor	Contribution to Economic Growth
(a)	KMA		11081645	100	11081645
(b)	LTC		3155715.59	100	3155715.59
(c)	Med Treatment		7107	100	7107
(d)	TA: Misc Expenses		51370	100	51370
(e)	TA: Transport		118955	100	118955
(f)	TA: Incidental Charges		31752	100	31752
(g)	Unit Allce		126797	100	126797
(h)	Family Welfare Org		76098	100	76098
(j)	Post-Partum Cell AFMC		18696	100	18696
(k)	Move by Rail & IWT		34003329	100	34003329
(l)	Air Transportation		1826114	100	1826114
(m)	Hired Transport		6041372	100	6041372
(n)	Purchase of Fodder		659000	0.78	84487179.5
(o)	Production Charges		1151000	0.78	147564103
(p)	Misc Expdr Mil Farms		110000	0.78	14102564.1
(q)	Transport: Mil Farms		70000	0.78	8974358.97
(r)	Transport: ECHS		25000	100	25000
(s)	Stores: ECHS		7065000	100	7065000
(t)	Info Technology		335000	100	335000
(u)	Medical Expenditure		21928000	100	21928000
(v)	Miscellaneous ECHS		350000	100	350000
(w)	Revenue Works		150000	100	150000
(x)	Transport: Insp Org		357500	100	357500
(y)	Purchase of Material		1639400	100	1639400
(z)	Info Technology		93100	100	93100
(aa)	Trg of Civilian Personnel		8100	25	32400

S No	Nature of Cost	Budget Allotment	Multi Factor	Contribution to Economic Growth
(ab)	Ration purchase	67728700	100	67728700
(ac)	Animals Purchase	2700	100	2700
(ad)	Ordnance Stores	89501631	25	358006524
(ae)	Clothing Stores	18512327	25	74049308
(af)	Transport Stores	12758542	25	51034168
(ag)	Tools Plants & Machinery	1936754	25	7747016
(ah)	Engineer Stores	2647299	25	10589196
(ai)	Engineer Parks	298520	25	1194080
(aj)	Works (Maj, Min & Revenue)	9698560	100	9698560
(ak)	Maintenance Works	28470882	100	28470882
(al)	Water & Elec Bills	38352862	100	38352862
(am)	Rentals & Statutory Payments	4275077	100	4275077
(an)	ASC Stores	2240927	100	2240927
(ao)	Petroleum Products	2038146	60	3396910
(ap)	Coal & Firewood	5189	100	5189
(aq)	Other ASC Stores	22834	100	22834
(ar)	Ord Stores	1915202	25	7660808
(as)	Clothing Stores	314677	25	1258708
(at)	MT Veh & Spares	450082	25	1800328
(au)	Works : Spl Facilities	682901	100	682901
(av)	Info Technology	191679	100	191679
(aw)	Transport: NCC	115000	41.2	279126.214
(ax)	Stores: NCC	861300	41.2	2090533.98
(ay)	Revenue Works: NCC	270400	41.2	656310.68
(az)	Training: NCC	1300000	41.2	3155339.81
(ba)	Info Tech: NCC	32200	41.2	78155.3398
(bb)	Conservancy & Weather Est Charges	11995520	100	11995520

S No	Nature of Cost		Budget Allotment	Multi Factor	Contribution to Eco Growth
(bc)	Unit Allowance		10290310	100	10290310
(bd)	Telephone Charges		1260577	100	1260577
(be)	Payment to 'Survey of India' and other agencies supply of Maps, Aerial Photographs		310305	100	310305
(bf)	Grants in Aid to Institutions		248452	100	248452
(bg)	Adventure Cell		119700	100	119700
(bh)	Op Sadbhavana		545000	100	545000
(bj)	Army Cdr Spl Fin Powers		59213	30	17763.9
(bk)	Anti-Malaria and Anti Fly Measures		2981	100	2981
(bl)	Other Misc Charges		3208831	100	3208831
(bm)	Payment to state Govt		158000	100	158000
(bn)	Sports Activities		418950	100	418950
(bo)	Trg of Personnel Abroad		50000	100	50000
(bp)	Departmental Canteens		115380	100	115380
(bq)	Legal Expenses		182000	100	182000
(br)	Sports Activities		418950	100	418950
(bs)	Trg of Personnel Abroad		50000	0	0
(bt)	Departmental Canteens		115380	100	115380
(bu)	Legal Expenses		182000	100	182000
Total					1037661169 103.77 Crs

Appx 'G'
(Refers to Chapter 3 of Study)

NAVY : REVENUE EXPENDITURE

Ser No	Particulars	BE 19-20
1	Pay and allowances of Navy	66532000
	Charged	68000
2	Pay and allowances of Civilians	27960000
	Charged	40000
3	Transportation	5857400
4	Repair & Refits	12559500
5	Stores	58123500
6	Works	15991500
	Charged	9200
7	Joint Staff	31805100
8	Other Expenditure	8155700
	Charged	15200
Total		226984700
Charged		132400
Total		22711700 2.27 Crs

Appx 'H'
(Refers to chapter 3 of Study)

DIRECT TAX CONTRIBUTION : NAVY

Ser No	Particulars	BE 19-20	Multiplication Factor	Contribution to Economy
1.	Pay and allowances of Commissioned and SD list Officers and Cadets			
	1. Naval HQ	2234717	0.23	513984.91
	2. Ships	3108938	0.23	715055.74
	3. Trg Ships	2603895	0.23	598895.85
	4. Est and units other	8245465	0.23	1896456.95
	5. Repair Org	1604904	0.23	369127.92
	6. Material Org	304690	0.23	70078.7
	7. Others	1622992	0.23	373288.16
	Total (A)	19725600		4536888.23
	Charged	68000		
2.	Pay and allowances of Sailors, etc			
	1. Ships (other than Trg ships)	14864454	0.07	1040511.78
	2. Trg Ships	6061399	0.07	424297.93
	3. Est and units other	17328937	0.07	1213025.59
	4. Repair Org	910289	0.07	63720.23
	5. DSC personnel with Navy	3956000	0.07	276920
	6. Others	2393321	0.07	167532.47
	Total (B)	45514400		3186008
3.	Kit & uniform maint allowance	194400		
4.	Leave Travel Concession			
	1. Officers	529545	1	529545
	2. Others	531055	1	531055
	Total (D)	1060600		
5.	Medical Treatment			
	1. Officers	11625	1	11625
	2. Others	25375	1	25375
	Total (E)	37000	1	37000
Total		66532000	1	66532000
Charged		68000	1	68000
Total Pay & Allowance of Navy				74396896.23 7.44 Crs

Appx 'J'
(Refers to Chapter 3 of Study)

CONTRIBUTION OF WAGES: NAVY

Ser No	Particulars	BE 19-20	Multiplication Factor	Contribution to Economy
1.	Pay and allowances of Commissioned and SD list Officers and Cadets			
	1. Naval HQ	2234717	0.3	670415.1
	2. Ships	3108938	0.3	932681.4
	3. Training Ships	2603895	0.3	781168.5
	4. Est and units other	8245465	0.3	2473639.5
	5. Repair Org	1604904	0.3	481471.2
	6. Material Org	304690	0.3	91407
	7. Others	1622992	0.3	486897.6
	Total (A)	19725600		5917680.3
	Charged	68000		
2.	Pay and allowances of Sailors			
	1. Ships (other than Trg ships)	14864454	0.3	4459336.2
	2. Trg Ships	6061399	0.3	1818419.7
	3. Est and units other	17328937	0.3	5198681.1
	4. Repair Org	910289	0.3	273086.7
	5. DSC personnel serving with Navy	3956000	0.3	1186800
	6. Others	2393321	0.3	717996.3
	Total (B)	45514400		13654320
3.	Kit and uniform Maint allowance	194400		
4.	Leave Travel Concession			
	1. Officers	529545	1	529545
	2. Others	531055	1	531055
	Total (D)	1060600		
5.	Medical Treatment			
	1. Officers	11625		
	2. Others	25375		
	Total (E)	37000		
Total Minor Head 101		66532000		
Charged		68000		
Total				19572000.3 1.96 Crs

Appx 'K'
(Refers to Chapter 3 of Study)

SUMMARY - NAVY'S CONTRIBUTION VIA INDIRECT TAXES

S No	Nature of Cost	Budget Allotment (Cost in Thousand)	Tax Applicable	Tax %	Contribution Economic Growth (In Thousands)
(a)	KMA	194400	VAT	13.58	26399.52
(b)	LTC	1060600	Service Tax	3.58	37969.48
(c)	Med Treatment	37000	Sales Tax	5	1850
(d)	Conveyance of Naval Personnel	4021900	Service Tax	3.58	143984.02
(e)	Freight Charges	385737	Service Tax	3.58	13809.3846
(f)	Pilotage and Towing	219000	VAT	13.58	29740.2
(g)	Hire of vessels	139800	VAT	13.58	18984.84
(h)	Hired Transport	1042463	VAT	13.58	141566.4754
(j)	Passage and conveyance of MES Est	48500	VAT	13.58	13809.3846
(k)	Repair and Refits	12559500	VAT	13.58	1705580.1
(l)	Naval Stores : Trade	3809000	VAT	13.58	517262.2
(m)	Provision of water	2223300	VAT	13.58	301924.14
(n)	Petrol and lubricants	629200	Fuel Tax	40	251680
(o)	Coal, Firewood and cooking Gas	114100	VAT	13.58	15494.78
(p)	Oil and Fuel	19258315	Fuel Tax	40	7703326
(q)	Armt Stores	4614300	VAT	13.58	626621.94
(r)	Clothing: OFB	626069	VAT	13.58	85020.1702
(s)	Clothing: Trade	424506	VAT	13.58	57647.9148
(t)	Medical Stores	888100	Sales Tax	5	44405
(u)	Transport Veh	120606	VAT	13.58	16378.2948
(v)	Spare parts	7655725	VAT	13.58	1039647.455
(w)	Weapon Spares	6000000	VAT	13.58	814800
(x)	Spl Eqpt for Scientific Lab	20700	VAT	13.58	2811.06
(y)	Avn Stores	4803200	VAT	13.58	652274.56
(z)	Info Technology	1040885	VAT	13.58	141352.183
(aa)	Indigenisation & devp of eqpt	221994	VAT	13.58	30146.7852
(ab)	Indigenisation Incubators	26700	VAT	13.58	3625.86

S No	Nature of Cost		Budget Allotment (Cost in Thousand	Tax Applicable	Tax %	Contribution Economic Growth (In Thousands)
(ac)	Research and Development		335900	VAT	13.58	45615.22
(ad)	Rent for hired /Leased/		635388	VAT	13.58	86285.6904
(ae)	Requisitioned Building Costs		102410	VAT	13.58	13907.278
(af)	Annual recurring compensation		1641	VAT	13.58	222.8478
(ag)	Rates and Taxes		211445	VAT	13.58	28714.231
(ah)	Dept Charges on works by MES		327414	VAT	13.58	44462.8212
(ai)	Maint Dredging		580300	VAT	13.58	78804.74
(aj)	Maint of Marine Assets		536400	VAT	13.58	72843.12
(ak)	Tools, Plants and Machinery		45736	VAT	13.58	6210.9488
(al)	Transportation		937900	VAT	13.58	127366.82
(am)	Stores		1900000	VAT	13.58	258020
(an)	Expdr on works		4000000	VAT	13.58	543200
(ao)	LEMOA (Lgs Exchange Memorandum)		400000	VAT	13.58	54320
(ap)	Unit Allowances & misc expdr		1984100	VAT	13.58	269440.78
(aq)	Printing, Sty and Forms		169300	VAT	13.58	22990.94
(ar)	Amenities		72400	VAT	13.58	9831.92
(as)	Telephones Charges		934300	VAT	13.58	126877.94
(at)	Other Misc Expenditure		4155800	VAT	13.58	564357.64
(au)	Sports Activities		642600	VAT	13.58	87265.08
(av)	MES Est		127700	VAT	13.58	17341.66
(aw)	Grants-in-Aid to Institutions		24300	VAT	13.58	3299.94
(ax)	Flight Safety related activities		31900	VAT	13.58	4332.02
(ay)	Legal Expenses		13300	VAT	13.58	1806.14
Total						16898406.44 1.69 Crs

Appx 'L'
(Refers to Chapter 3 of Study)

INDIRECT CONTRIBUTION OF NAVY: ECONOMY

S No	Nature of Cost	Budget Allotment	Multi Factor	Contribution Economic Growth
(a)	KMA	194400	1	194400
(b)	LTC	1060600	1	1060600
(c)	Med Treatment	37000	1	37000
(d)	Conveyance of Naval Personnel	4021900	1	4021900
(e)	Freight Charges	385737	1	385737
(f)	Pilotage and Towing	219000	1	219000
(g)	Hire of vessels	139800	1	139800
(h)	Hired Transport	1042463	1	1042463
(j)	Passage and conveyance of MES	48500	1	48500
(k)	Repair and Refits	16368500	1	16368500
(l)	Provision of water	2223300	1	2223300
(m)	Petrol and lubricants	629200	1	
(n)	Coal, Firewood and cooking Gas	114100	1	114100
(o)	Oil and Fuel	19258315	1	
(p)	Armament Stores	4614300	0.25	1153575
(q)	Clothing Stores: OFB	626069	0.25	
(r)	Clothing Stores: Trade	424506	0.25	106126.5
(s)	Medical Stores	888100	1	
(t)	Transport Veh	120606	1	120606
(u)	Spare parts including machinery	7655725	1	
(v)	Weapon Spares/Eqpt	6000000	0.25	1500000
(w)	Spl Eqpt for Labs	20700	0.25	
(x)	Avn Stores	4803200	0.25	1200800
(y)	Info Technology	1040885	1	
(z)	Indigenisation and devp of eqpt/System	221994	0.25	55498.5

S No	Nature of Cost	Budget Allotment	Multi Factor	Contribution Economic Growth
(aa)	Indigenisation Incubators	26700	0.25	6675
(ab)	Research and Development	335900	0.25	83975
(ac)	Rent for hired /Leased/	635388	1	635388
(ad)	Requisitioned Building Costs	102410	1	102410
(ae)	Annual recurring compensation"	1641	1	1641
(af)	Rates and Taxes	211445	1	211445
(ag)	Dept Charges on Works	327414	1	327414
(ah)	Maint Dredging	580300	1	580300
(ai)	Maint of Marine Assets	536400	1	536400
(aj)	Tools, Plants and Machinery	45736	0.25	11434
(ak)	Transportation	937900	1	937900

Appx 'M'
(Refers to Chapter 3 of Study)

AIR FORCE (REVENUE EXPENDITURE)

Ser No	Particulars	BE 19-20	Multiplication Factor	Contribution Economic Growth
1.	Pay and allowances of Officers			
	(i) Flying	9977038	0.3	2993111.4
	(ii) Tech	10011231	0.3	3003369.3
	(iii) Non Tech	10108306	0.3	3032491.8
	Total (A)	30096575	0.3	9028972.5
	Charged	33100		
2.	Pay and allowances of Flt Cdts			
	(i) Flying	156123	0.3	46836.9
	(ii) Tech	55684	0.3	16705.2
	(iii) Non Tech	62410	0.3	18723
	Total (B)	274217		82265.1
3.	Pay and allowances of Airmen			
	(i) Tech	54863731	0.3	16459119.3
	(ii) Non Tech	55406459	0.3	16621937.7
	Total (C)	110270109		33081057
4.	Pay & Allowances of NCs€	6797321	0.3	2039196.3
5.	Leave Travel Concession			
	(i) Officers	721200	1	721200
	(ii) Others	1406800	1	1406800
	Total (E)	2128000	1	2128000
6.	Medical Treatment			
	(i) Officers	6000	1	6000
	(ii) Others	14000	1	14000
	Total (F)	20000	1	20000
Total		149586303		46359490.9 Rs 4.64 Crs

Appx 'N'
(Refers to Chapter 3 of Study)

AIR FORCE: DIRECT TAX CONTRIBUTION

Particulars	BE 19-20	Multiplication Factor	Contribution Economic Growth
Pay and Allowances of Officers			
Flying	9977038	0.23	2294718.74
Tech	10011231	0.23	2302583.13
Non Tech	10108306	0.23	2324910.38
Total Wages of Officers	30096575	0.23	6922212.25
Pay and allowances of Flt Cdts			
Flying	156123	0.23	35908.29
Tech	55684	0.23	12807.32
Non Tech	62410	0.23	14354.3
Total wages of Flt Cdts	274217		63069.91
Pay and Allowances of Airmen			
Tech	54863731	0.07	3840461.17
Non Tech	55406459	0.07	3878452.13
Total wages of Airmen	110270109		7718913.3
Pay & Allowances of NCs€	6797321	0.07	475812.47
Total Direct Contribution of IAF through Income Tax			15180007.93 Rs 1.51 Crs

Appx 'O'
(Refers to Chapter 3 of Study)

SUMMARY : IAF'S INDIRECT CONTRIBUTION THROUGH WAGES

S No	Nature of Cost		Budget Allotment	Tax Applicable	Tax %	Contribution to Economy in Thousands
(a)	Travelling & Outstation Allowance		7320790	VAT	13.58	994163.282
(b)	Rail Charges		940000	Service Tax	3.58	33652
(c)	Air Transportation		2912200	Service Tax	16	465952
(d)	Sea & Inland Water Charges		10400	Service Tax	3.58	372.32
(e)	Hired Tpt Charges		4288496	VAT	13.58	582377.7568
(f)	Conveyance of MES Est		86851	VAT	13.58	11794.3658
(g)	Air Frame and Engines		29418095	VAT	13.58	3994977.301
(h)	Avn Stores		20650583	VAT	13.58	2804349.171
(j)	MT Stores		770240	VAT	13.58	104598.592
(k)	Provisions		422408	VAT	13.58	57363.0064
(l)	Coal, Firewood and LPG		116978	VAT	13.58	15885.6124
(m)	POL Items		25137314	Fuel Tax	40	10054925.6
(n)	Ord Stores : Trade		1168271	VAT	13.58	158651.2018
(o)	Supplied by DGOF		9303800	VAT	13.58	1263456.04
(p)	Clothing: Trade		941061	VAT	13.58	127796.0838
(q)	Supplied-DGOF		1077500	VAT	13.58	146324.5
(r)	Medical Stores		1330133	VAT	13.58	180632.0614
(s)	Misc Stores		1595836	VAT	13.58	216714.5288
(t)	Res & Devp		1212926	VAT	13.58	164715.3508
(u)	Info Technology		1002555	VAT	13.58	136146.969
(v)	Security Eqpt		586000	VAT	13.58	79578.8
(w)	Rent hired/ Leased/ Bldg		109306	VAT	13.58	14843.7548
(x)	Rates and Taxes		2050000	VAT	13.58	278390
(y)	Payment for Railway siding		8325	VAT	13.58	1130.535
(z)	Rent hired// Leased Lands		100000	VAT	13.58	13580
(aa)	Misc		1000	VAT	13.58	135.8

S No	Nature of Cost		Budget Allotment	Tax Applicable	Tax %	Contribution to Economy In Thousands
(ab)	Dept Charges on works by MES		500000	VAT	13.58	67900
(ac)	Tools, Plants and Machinery		199000	VAT	13.58	27024.2
(ad)	Special Project		100	VAT	13.58	13.58
(ae)	Unit Allowances & misc expenses		2846227	VAT	13.58	386517.6266
(af)	Meteorological civ dept		4200	VAT	13.58	570.36
(ag)	Conservancy		699261	VAT	13.58	94959.6438
(ah)	Hot-weather Est, charges		12282	VAT	13.58	1667.8956
(aj)	Trunk calls charges only		50000	VAT	13.58	6790
(ak)	Telephone charges		198541	VAT	13.58	26961.8678
(al)	Renting of circuits		575032	VAT	13.58	78089.3456
(am)	Annual Trg Grant		372543	VAT	13.58	50591.3394
(an)	Edn Grant		85995	VAT	13.58	11678.121
(ao)	Amenities		6359	VAT	13.58	863.5522
(ap)	Anti-malaria and Anti-measures		6201	VAT	13.58	842.0958
(aq)	Printing and Sty and forms		307095	VAT	13.58	41703.501
(ar)	Other Misc charges		2090863	VAT	13.58	283939.1954
(as)	Payment to P&T & railway Depts		100	VAT	13.58	13.58
(at)	Trg of Civ employee - IAF		11000	VAT	13.58	1493.8
(au)	Grant in Aid to Institution		30300	VAT	13.58	4114.74
(av)	Sports Activities		209000	VAT	13.58	28382.2
(aw)	Trg of personnel abroad		500	VAT	13.58	67.9
(ax)	Adventure Cell		65931	VAT	13.58	8953.4298
(ay)	Dept Canteens		15000	VAT	13.58	2037
(az)	MES Est		227300	VAT	13.58	30867.34
(ba)	Legal Expenses		28370	VAT	13.58	3852.646
Total Indirect Contribution of IAF to Economy						23062401.59 Rs 2.30 Crs

Appx 'P'
(Refers to Chapter 3 of Study)

INDIRECT STIMULUS OF AIR FORCE - ECONOMY

S No	Nature of Cost		Budget Allotment	Multi Factor	Contribution to Economy (In Thousands)
(a)	Travelling and Outstation Allowance		7320790	1	7320790
(b)	Rail Charges		940000	1	940000
(c)	Air Transportation Charges		2912200	1	2912200
(d)	Sea & Inland Water Charges		10400	1	10400
(e)	Hired Tpt Charges		4288496	1	4288496
(f)	Conveyance of MES Est		86851	1	86851
(g)	Air Frame and Engines		29418095	0.25	7354523.75
(h)	Avn Stores		20650583	0.25	5162645.75
(j)	MT Stores		770240	0.25	192560
(k)	Provisions		422408	1	422408
(l)	Coal, Firewood and LPG		116978	1	116978
(m)	POL Items		25137314	1	25137314
(n)	Ord Stores : Trade		1168271	0.25	292067.75
(o)	Supplied by DGOF		9303800	0.25	2325950
(p)	Clothing : Trade		941061	0.25	235265.25
(q)	Supplied by DGOF		1077500	0.25	269375
(r)	Medical Stores		1330133	1	1330133
(s)	Other Misc Stores		1595836	1	1595836
(t)	Research & Development		1212926	1	1212926
(u)	Info Technology		1002555	1	1002555
(v)	Security Eqpt		586000	1	586000
(w)	Rent for hired/ Leased Bldg		109306	1	109306
(x)	Rates and Taxes		2050000	1	2050000
(y)	Payment for Railway siding		8325	1	8325
(z)	Rent for hired/ Leased Lands		100000	1	100000
(aa)	Misc		1000	1	1000
(ab)	Dept Charges on works by MES, etc		500000	1	500000

S No	Nature of Cost		Budget Allotment	Multi Factor	Contribution to Economy (In Thousands)
(ac)	Tools, Plants and Machinery		199000	1	199000
(ad)	Special Project		100	1	100
(ae)	Unit Allowances and misc expenses		2846227	1	2846227
(af)	Meteorological facilities - civ dept		4200	1	4200
(ag)	Conservancy		699261	1	699261
(ah)	Hot-weather Estt, charges		12282	1	12282
(aj)	Trunk calls charges only		50000	1	50000
(ak)	Other telephone charges		198541	1	198541
(al)	Renting of circuits		575032	1	575032
(am)	Annual Trg Grant		372543	1	372543
(an)	Edn Grant		85995	1	85995
(ao)	Amenities		6359	1	6359
(af)	Anti-malaria and Anti-measures		6201	1	6201
(ag)	Printing and Sty and forms		307095	1	307095
(ah)	Other Misc charges		2090863	1	2090863
(aj)	Payment to P&T and railway depts		100	1	100
(ak)	Trg of Civ employee of IAF		11000	1	11000
(al)	Grant in Aid to Institution		30300	1	30300
(am)	Sports Activities		209000	1	209000
(an)	Trg of personnel abroad		500	1	500
(ao)	Adventure Cell		65931	1	65931
(ap)	Departmental Canteens		15000	1	15000
(aq)	MES Est		227300	1	227300
(ar)	Legal Expenses		28370	1	28370
Total Indirect Stimulus of Air Force					73605105.5 Rs 7.36 Crs

Appx 'Q'
(Refers to Chapter 3 of Study)

DEFENCE ORDNANCE FACTORIES - REVENUE

Ser No	Particulars	BE 19-20
1	Direction and Adm	1500000
	Charged	1800
2	Research and Development	960000
3	Maint - Machinery and Eqpt	400000
4	Manufacture	69290000
	Charged	10000
5	Transportation	1550000
6	Renewal and Replacement	4750000
7	Stores	58779100
	Charged	30000
7	Works	2500000
8	Transfer to Renewal Reserve Fund- Renewal Reserve Fund Ord Factories - Inter Acct Transfer	4750000
9	Other Expenditure	12000000
	Charged	10000
Total		156479100
Charged		51800
Total		156530900 Rs 15.65 Crs

Appx 'R'
(Refers to Chapter 3 of Study)

DIRECT TAX CONTRIBUTION OF OFB - ECONOMY

S No	Particulars	BE 19-20	Multi Fac-tor (IT)	Contri-bution to Economy	Multi Fac-tor	Indirect Contri-bution
(a)	Pay of Officers	619100	0.08	49528	0.3	185730
(b)	Pay of Others	440900	0.08	35272	0.3	132270
(c)	Travelling Allces	157500	0.08	12600	0.3	47250
(e)	Misc Expenses	242500	0.08	19400	0.3	72750
(f)	Overtime Allowance	5000	0.08	400	0.3	1500
(g)	Medical Treatment	15000	0.08	1200	0.3	4500
(h)	Pay & Allowances	59975000	0.08	4798000	0.3	17992500
(j)	Overtime Allowance	7920000	0.08	633600	0.3	2376000
(k)	Medical Treatment	973200	0.08	77856	0.3	291960
	Total			5627856		21104460
	Total National Contribution					37513465 Rs3.75Crs

Appx 'S'
(Refers to Chapter 3 of Study)

INDIRECT TAX CONTRIBUTION OF OFB - ECONOMY

S No		Particulars	BE 19-20	Multipli-cation Factor (%)	Contribution to Economy
(a)		Research & Development	960000	13.58	130368
(b)		Maint - Machinery & Eqpt	400000	13.58	54320
(c)		Move of Personnel : TD	815000	3.58	29177
(d)		Permt Move of Personnel:	80300	3.58	2874.74
(e)		Move Pers : Foreign Travel	45200	3.58	1618.16
(f)		Move of Personnel: Veh	170000	13.58	23086
(g)		Move of stores By Rail	9000	3.58	322.2
(h)		Move of stores by CHT	340000	13.58	46172
(j)		Others	90500	13.58	12289.9
(k)		Renewal & Replacement	4750000	13.58	645050
(l)		Stores	58779100	13.58	7982201.78
(m)		Expenditure on Building etc	1900000	13.58	258020
(n)		Other Revenue Works	600000	13.58	81480
(o)		Expenditure and water	5600000	13.58	760480
(p)		Comn (Telephone/Tele Fax)	100000	13.58	13580
(q)		Training	60000	13.58	8148
(r)		Office Eqpt	10000	13.58	1358
(s)		Hospital/Lab Eqpt	35000	13.58	4753
(t)		Consumables	260000	13.58	35308
(u)		Contract Labour	3210000	13.58	435918
(v)		Departmental Canteens	330000	13.58	44814
(x)		Transfer of Technology	1500000	13.58	203700
(y)		Legal Expenses	45000	13.58	6111
Total Indirect Contribution to Local Economy: Ordnance Factory Board					10781149.78 Rs 1.08 Crs

Appx 'T'
(Refers to Chapter 3 of Study)

DRDO – REVENUE EXPENDITURE

Ser No		Particulars	BE 19-20
1		Trg	200000
2		Research /Research and Development	11782700
3		Pay & allowances of Service Personnel	4400000
4		Pay & allowances of Civilians	31319600
		Charged	1100
5		Transportation	2000000
6		Stores	25498000
		Charged	2000
7		Works	10199800
		Charged	200
8		Other Expenditure	3959500
		Charged	3000
Total			89359600 Rs 8.94Crs

Appx 'U'
(Refers to Chapter 3 of Study)

DIRECT TAX CONTRIBUTION OF DRDO - ECONOMY

S No	Particulars	BE 19-20	Multi-plication Factor	Contribution to Economy	Multi-plication Factor	Contrib-ution to Nation
1	Trg	200000	0.08	16000	0.3	60000
2	Research/ Research and Development	11782700	0.08	942616	0.3	3534810
3	Pay & Allowances of Service Personnel	4400000	0.08	352000	0.3	1320000
4	Pay & Allowances of Civilians	31319600	0.08	2505568	0.3	9395880
5	Transportation	2000000	0.08	160000	0.3	600000
6	Stores	25498000	0.08	2039840	0.3	7649400
7	Works	10199800	0.08	815984	0.3	3059940
8	Other Expdr	3959500	0.08	316760	0.3	1187850
			Total	7148768		26807880
	Total Contribution of DRDO			33956648 Rs 3.40 Crs		

Appx 'V'
(Refers to Chapter 3 of Study)

INDIRECT TAX CONTRIBUTION OF DRDO - ECONOMY

Ser No	Particulars	BE 19-20	Multiplication Factor	Contribution to Nation
1	Trg	200000	13.58	27160
2	Research, Research and Development	11782700	13.58	1600090.66
5	Transportation	2000000	3.58	71600
6	Stores	25498000	13.58	3462628.4
7	Works	10199800	13.58	1385132.84
8	Other Expenditure	3959500	13.58	537700.1

Appx 'W'
(Refers to Chapter 3 of study)

CAPITAL BUDGET: CONTRIBUTION OF SERVICES CAPITAL BUDGET TO NATIONAL ECONOMY

S No	Particulars	BE 19-20		Contribution to Economy Indirect Taxes		Contribut-ion & Stimulus to Economy
Army						
(a)	Total Contribution towards Economy: Army			42197565.2 4.22 Crs		96089559.7 9.61 Crs
Navy						
(b)	Total Contribution: Navy & Jt Staff			180271975.2 18.02 Crs		389381000 38.94 Crs
IAF						
(c)	Total Contribution towards Nation Building: IAF			51906061.7 5.19 Crs		115201020 11.52 Crs
	Total Contribution of Services			274375602.1 27.44 Crs		600671579.7 60.07 Crs

END NOTES

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