A CALL FOR ACTION: MODERNIZATION OF THE INDIAN ARMY TO MEET THE CHALLENGES OF THE TWENTY-FIRST CENTURY

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India faces conventional and non conventional threats from Pakistan and a conventional threat from China. Although India enjoys an edge in conventional capabilities against Pakistan, the capability is less against China. With rapid modernization of the Chinese PLA, the conventional capability gap between China and India is increasing in China's favor. The increasing Chinese investment in Pakistan especially in the China-Pakistan economic corridor and Gwadar port has opened the possibility of a dual front war for India.
This thesis will examine and evaluate security threats to India, the current state of modernization and the future modernization goals of the Indian Army. After evaluating the problems in achieving the modernization goals, the thesis will finally recommend suitable approaches to achieve the desired modernization goals.

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The opinions and conclusions expressed herein are those of the student author and do not necessarily represent the views of the U.S. Army Command and General Staff College or any other governmental agency. (References to this study should include the foregoing statement.)

ABSTRACT

A CALL FOR ACTION: MODERNIZATION OF THE INDIAN ARMY TO MEET THE CHALLENGES OF THE TWENTY-FIRST CENTURY, by Major Ashish Kumar Ojha,118 pages.

India faces conventional and non-conventional threats from Pakistan and a conventional threat from China. Although India enjoys an edge in conventional capabilities against Pakistan, the capability is less against China. With rapid modernization of the Chinese PLA, the conventional capability gap between China and India is increasing in China's favor. The increasing Chinese investment in Pakistan especially in the China-Pakistan economic corridor and Gwadar port has opened the possibility of a dual front war for India.

This thesis will examine and evaluate security threats to India, the current state of modernization and the future modernization goals of the Indian Army. After evaluating the problems in achieving the modernization goals, the thesis will finally recommend suitable approaches to achieve the desired modernization goals.

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ACRONYMS

CPEC	China Pakistan Economic Corridor
CDS	Chief of Defense Staff
DPP	Defense Procurement Procedure
DRDO	Defense Research and Development Organization
FDI	Foreign Direct Investment
GDP	Gross Domestic Product
MoD	Ministry of Defense
NSC	National Security Council
PSU	Public Sector Undertaking
PLA	People's Liberation Army
SLOC	Sea Lanes of Communication

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CHAPTER 1

INTRODUCTION

Background

The unresolved territorial and boundary disputes with China and Pakistan; instability in Bangladesh, Myanmar, Nepal, and Sri Lanka; terrorism in Jammu and Kashmir and North east states; and the rising tide of the Maoist insurgency[1] in the heartland are threatening India's security environment. Furthermore many security analyst worry that China is engaged in a strategic encirclement of India through its nuclear and missile nexus with Pakistan; the sale of military hardware to Bangladesh, Nepal, Myanmar, and Sri Lanka; and the "string of pearls" strategy to surround India with naval bases in the northern Indian ocean region.[2] Lt Gen Philip Campose in his article has stated that Pakistan, has been running a sub-conventional campaign against India since the early 1990s which involves stoking militancy in Jammu and Kashmir and pushing terror modules across the border to cause casualties among civilians and security personnel, to keep the Kashmir issue alive.[3]

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[1] Maoist Insurgency: The communist party of India adopted Indian social ideology and distanced itself from Chinese communist party. Dissatisfied with it, the rebels under Charu Mujumdar picked up arms against the landlords and to support the poor farmers in 1967. This uprising was called Naxalite or Maoist Insurgency.

[2] Gurmeet Kanwal, "India's Military Modernization: Plans and Strategic Underpinning," National Bureau of Asian Research for the Senate India Caucus, September 2012, accessed November 8, 2017 http://www.nbr.org/downloads/pdfs/Outreach/NBR_IndiaCaucus_September2012.pdf.

[3] Philip Compose, "Modernisation of Indian Army: Future Challenges," *News 18*, February 2, 2017, 1-2, accessed November 6, 2017, http://www.news18.com/news/india/modernisation-of-indian-Army-future-challenges-1342491.html.

The Indian Army is the most important player in the security of India. It has always kept itself ready to deal with any present or future challenges related to the security of India and the Indian people. The Indian Army is the third largest Army in the world in terms of size. But this description masks the fact that it is not as powerful as it might otherwise imply, in terms of its capacity to undertake more sophisticated military operations optimally in the multi-domain, technology-dominated battlefields of the future.[4] Although the Indian armed forces have drawn up elaborate plans for modernizing and qualitatively upgrading their capabilities for future combat, including the ability to secure the sea lanes of communication (SLOC) and project power in its area of strategic interest, the pace of modernization has been slow due to the lack of adequate funding, delayed decision-making, and a low-tech indigenous defense industrial base. India's defense budget is continuously kept less than two percentage of nation's Gross Domestic Product (GDP). The bulk of the defense budget expenditure is on the revenue account and a very little remains in the capital account to be spend on modernization (see page 6 for definition).[5] The inadequacy of funds is compounded by bureaucratic prevarication and risk averseness, frequent changes in qualitative requirements by the army and occasional corruption charges which result in blacklisting of vendors. Hence, not only is there a need to correctly identify the future orientation and equipment needs of the Army, but it is also important to find a way forward for building indigenous capacity and

[4] Compose, "Modernisation of Indian Army: Future Challenges."

[5] Laxman K. Behra. "India's Defence Budget 2012–13," Institute for Defence Studies and Analyses (IDSA), March 20, 2012, accessed November 6, 2017, http://www.idsa.in/idsacomments/IndiasDefence Budget2012-13_LaxmanBehera_200312.

speeding up the procurement process, while addressing the problems which invariably stunt those efforts.[6]

Research Question

Primary Question

How should India modernize its Army to meet the challenges of Twenty-first century?

Secondary Questions

1. What are the future challenges to the Indian Army?
2. What are the challenges to modernization of the Indian Army?

Assumptions

Based on literature available, it is assumed that India will continue to face the problem of terrorism from Pakistan and the territorial and boundary disputes with China and Pakistan. Due to its heavy investment in the China-Pakistan economic corridor (CPEC),[7] China will not change its existing policy towards Pakistan. The Defense budget of India will remain below two percentagesof its GDP.

[6] Compose, "Modernisation of Indian Army: Future Challenges."

[7] China is constructing CPEC from its southwest province of Xinjiang to Gwadar port in Pakistan. India considers this project as interference to its territorial integrity as it passes through Pakistan Occupied Kashmir, which was occupied by Pakistan during 1947-48 war and India considers Pakistan Occupied Kashmir as its integral part.

Definitions

There are certain definitions, which the readers should comprehend in order to understand the discussion to follow.

PLA. Chinese People's Liberation Army. Unified organization of China's land, sea, and air forces. It is one of the largest military forces in the world. The People's Liberation Army traces its roots to the 1927 Nanchang Uprising of the communists against the Nationalists. Initially called the Red Army, it grew under Zedong and Zhu De from 5,000 troops in 1929 to 200,000 in 1933.

String of Pearls. A geopolitical theory regarding potential Chinese intentions in the Indian Ocean region (IOR): refers to Chinese military and commercial facilities and relationships along its sea-lanes of communication (SLOCs), which extend from the Chinese mainland to Port Sudan. The sea-lanes run through major maritime choke points such as the Strait of Mandeb, the Strait of Malacca, and the Strait of Hormuz as well as other strategic maritime centers in Bangladesh, Myanmar, Sri Lanka, Pakistan, Maldives, and Somalia (see figure 1).

Figure 1. String of Pearls

Source: The Federalist, "India's New Aircraft Carrier to Counter China's Growing Navy," 14 August 2013, accessed 26 April 2017, http://thefederalist-gary.blogspot.com/2013/08/indias-new-aircraft-carrier-to-counter.html.

Gross Domestic Product (GDP). International Monetary Fund (IMF) defines GDP as measures of the monetary value of final goods and services; that is, those that are bought by the final user; produced in a country in a given period of time.[8] It counts all of the output generated within the borders of a country. GDP is composed of goods and services produced for sale in the market and also includes some nonmarket production, such as defense or education services provided by the government. GDP can be measured

[8] Tim Callen, "Gross Domestic Product: An Economy's All," International Monetary Fund: Finance and Development, July 29, 2017, accessed April 17, 2018, http://www.imf.org/external/pubs/ft/fandd/basics/gdp.htm.

in three ways. The Output measure is the value of the goods and services produced by all sectors of the economy; agriculture, manufacturing, energy, construction, the service sector and government. The Expenditure measure is the value of the goods and services purchased by households and by government, investment in machinery and buildings. It also includes the value of exports minus imports. The Income measure is the value of the income generated mostly in terms of profits and wages.

Revenue and Capital Expenditure. Defense budget expenditure in India can be broadly categorized as revenue and capital expenditures:

1. Revenue Expenditure: Revenue expenditure refers to the expenditure which neither creates any asset nor causes reduction in any liability of the government. Examples are Payment of salaries, pensions, health services, welfare and recreation activities etc.
2. Capital Expenditure: Capital expenditure refers to the expenditure which either creates an asset or causes a reduction in the liabilities of the government. Examples are procurement of weapons and equipment etc.

Limitations

This thesis has huge potential for research, studies, and interpretation. The body of literature regarding the security challenges to India and modernization of the Indian Army in terms of weapons and equipment is enormous; however, the organizational modernization of the Indian Army, is much less. Most of the literature revolves around the procurement policies but much less literature focuses on the indigenization and policy making. The research was conducted with the utmost objectivity. For the purpose of this

research, only modernization of the Indian Army will be considered. Also only unclassified materials and open sources information will be considered for this thesis.

Delimitations

The thesis, as stated earlier, has a very broad scope because of the nature of security environment, hybrid threats, and the requirements for the Indian Army to deal with all these threats. It is not qualitatively possible to cover all the threats and all aspects of modernization. Therefore, to limit the scope of the thesis, the focus is primarily on organizational modernization and modernization of weapon and equipment. The author will cover points required to increase the jointness amongst the Indian Armed forces. The security threats in the Indian Ocean Region (IOR) will not be covered.

Significance of Study

The modernization of the Chinese PLA, Chinese collusion with Pakistan, and slow modernization of the Indian Army is deeply concerning to the leadership of the Indian Army. Therefore, it is very important for India to modernize its armed forces to counter these threats. India has a developing economy. There are a lot of challenges including the economic challenges (availability of budget), in order to achieve the desired modernization goals. Rising population, unemployment, illiteracy, and poverty are all issues that compete for availability of the defense budget. Hence, this thesis proposes suitable approaches to modernize Indian Army with limited resources to meet the challenges of twenty-first century.

Conclusion

Indian Army modernization provides a net gain for India's strategic power and regional influence. This modernization also strengthens India's capacity to contribute to regional peace and security. India's modernization plans are moving ahead at a very slow pace. Lack of strong policy from the political leadership due to the vagaries of coalition politics in Indian democratic system (multi-party system), along with the reduction in the defense budget as a share of India's GDP, has exacerbated the difficulties in increasing the speed of modernization. However, the process of modernization is certainly underway, and there is hope that it will receive support across the political spectrum because of the realization that no alternative exists for addressing emerging threats and challenges; but for India to quickly modernize its armed forces.[9]

[9] Kanwal, "India's Military Modernization: Plans and Strategic Underpinning," 7.

CHAPTER 2

LITERATURE REVIEW

Literature on this topic will cover four important aspect related to the modernization of the Indian Army. The chapter will start with a review of the security threats to India and requirements for modernization of the Indian Army to mitigate this security threat. Thereafter the review will look at the challenges for modernization of the Indian Army. Finally, the review will give the recommendations for overcoming the challenges of building the modern Indian Army.

There are numerous threats and challenges to the Indian Army in order to maintain peace and stability in the country. These threats and challenges are categorized as conventional and non-conventional/hybrid. Conventional threats primarily emanate from territorial disputes involving its two nuclear armed neighbors China and Pakistan, over which five wars have already been fought since India's independence. However, with India having a sustainable nuclear capability, the possibility of a conventional war is very low. In the aftermath of the Afghanistan and Iraq wars of the first decade of this century, the world has witnessed a reduction in full-fledged conventional wars. Hybrid wars appear to be the new norm, involving a combination of two or more of the Conventional / Regular warfare, Irregular warfare, Asymmetric warfare, Unconventional warfare, and Technological/ Informational warfare.[10]The Pakistan Army has adopted the same concept. It has kept the threat of conventional war alive and has also waged a non-conventional war against India by supporting terrorist organizations with training,

[10] Compose, "Modernisation of Indian Army: Future Challenges."

logistics and financial support, to destabilize India and cause casualties among civilians and security personnel. Pakistan has leased the Gwadar port to China. China is also investing approximately $50 billion on the China Pakistan economic corridor. There is also a belief that China has provided the nuclear and missile technology to Pakistan. These nexus between Pakistan and China suggests that India may face a 'two front threat.'[11]

The Indian Army should prepare for a war fighting capability in all spectrums of warfare (nuclear, conventional, sub-conventional) to achieve a favorable outcome even in a 'two front war' scenario. In the seminar organized by Centre for Land Warfare Studies(CLAWS) the then Chief of Army Staff (COAS) General Deepak Kapur highlighted various conventional and non-conventional threats to India's national security and dwelt particularly on the internal security challenges in various forms like proxy wars, insurgency, militancy, illegal immigration, cyber-attacks, counterfeit currency, narcotics trafficking, propaganda and environmental degradation.[12] He stated that Naxal violence[13] is a law and order problem that needs to be tackled by the state government. General Kapur expressed the views that in the future the Army will have to deal with

[11] Compose, "Modernisation of Indian Army: Future Challenges."

[12] Mehrotra Mansi and Godbole Avinash, "Threats and Challenges for the Indian Army: Trends and Responses," Centre for Land Warfare Studies, January 14, 2009, 1-2, accessed November 12, 2017, http://www.claws.in/event-detail.php?eID=208. Who is the author, see note #14 and bib.

[13] Naxal violence: Naxalites are considered far-left radical communists, supportive of Maoist political sentiment and ideology. Their origin can be traced to the split in 1967 of the Communist Party of India (Marxist). They are involved in large scale violence in few tribal parts of India and are responsible for displacement of 350,000 tribal populations.

multi-front obligations which will include conventional warfare, proxy war, terrorism, insurgency, border management, disaster relief and humanitarian activities. He says that all of these threats and challenges should be factored in while developing an effective defense planning mechanism and India should maintain a modern and battle ready Army to face these threats and challenges.

Lieutenant General V G Patankar (retired) specifies four major sub-conventional threats and challenges for India in his article in the Center for land warfare studies. These include insurgency in the North-East states, proxy war in Jammu and Kashmir, Naxalism, and terrorism.[14]Pakistan is engaged in proxy war with India by providing training, logistic, and financial support to terrorists' organizations against India. India has been able to contain the insurgency in North-East states of by development, active involvement of the Indian Army and other security agencies and support from Myanmar and Bangladesh. However, Pakistan has adopted terrorism as a tool to achieve its strategic gains against India. General Patankar says that in the future, India must ensure self-reliance in policy by taking small but firm steps, shed the Third World attitude, back actions with economic and military muscle, bide our time and act when it is ready for action as well as consequences thereof.[15] To mitigate these threats India needs to build Armed forces capability based on long term planning. Although the Indian economy is growing rapidly, with the present population and poverty, it is difficult for India to rise as an economic superpower. The economic conditions of the citizens are the biggest hurdle

[14] Mansi and Avinash, "Threats and Challenges for the Indian Army: Trends and Responses," 3-4.

[15] Ibid.

in increasing the defense budget. But if India wants to mitigate the threats, India needs a modern armed forces capable of taking low-level short and swift actions while maintaining its readiness for major war situations from both China and Pakistan.[16]

Similarly, another article written in the magazine Center for Land Warfare Studies (CLAWS) by Major General G D Bakshi (retired) specifies that the existential threats that arise from external sources are those that emanate from China and Pakistan.[17] These threats are most likely to manifest themselves in the form of limited wars under conditions of nuclear symmetry. He had written that India enjoyed a clearly favorable asymmetry in military capabilities with Pakistan in the past. India's economic rise has gaven it an opportunity to enhance the conventional deterrence, but due to bad policies, the Indian government has let Pakistan close the conventional military gap to a certain level. India failed to grab the opportunity to emerge as a regional power in terms of military capabilities. He also stresses on the point that it is mandatory for India to regenerate the conventional asymmetry with Pakistan to a substantial level in order to deter Pakistan while India is dealing with China. For this, there is a prime need to urgently modernize the Indian armed forces and particularly the Indian Army.

On 30 August, 2017, Indian Defense Minister, Mr. Arun Jaitley announced a series of defense reforms including redeployment and restructuring of Indian Army organizations. He announced that these reforms are focused on measures to "enhance combat capability & rebalancing defense expenditure of the armed forces with an aim to

[16] Mansi and Avinash, "Threats and Challenges for the Indian Army: Trends and Responses," 3-4.

[17] Ibid., 5.

increase the 'teeth to tail ratio'."[18] He said that the government has given initial approval for 65 of a total of 99 recommendations for modernization plans pertaining to the Indian Army. These reforms are expected to be completed by December 31, 2019.[19] Although the reforms are announced, no budget was allotted for these reforms especially those that needs modern weapons, equipment, C4ISR capabilities etc. Even the parliamentary committee on security criticized the government on the pace of defense reforms and modernization in December 2017.[20] Therefore, the possibility of achieving all defense modernization recommendations looks less likely in the near future.

Vivek Chadha says there are numerous challenges to the reforms and modernization of the Indian Army. The concept of defense for the Indian armed forces is individual service centric, where each service plans and operates on its own, without coordinating with each other.[21] The absence of cohesion is mainly attributed to the absence of joint organizations pushing for joint planning and a joint strategy. He gives the example of counter terrorism approach by the security forces. Each service, the

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[18] Teeth to tail ratio: It is the ratio of forces fighting versus the forces supporting those fighting. In US Army it is called Tooth to tail ratio.

[19] Press Information Bureau, "Ministry of Defence approves first phase of reforms in The Armed Forces," Government of India, Ministry of Defence, August 30, 2017, accessed November 08, 2017, http://pib.nic.in/newsite/PrintRelease.aspx?relid=170365.

[20] Rajat Pundit, "Government draws Parliamentary panel fire on military modernization," *The Times of India*, December 20, 2017, accessed December 26, 2017, https://timesofindia.indiatimes.com/india/parliamentary-panel-slams-government-for-tardy-military-modernisation-despite-china-pak-threat/articleshow/62139138.cms.

[21] Chadha Vivek "Defence reforms: why it is critical to bite the proverbial bullet?" Institute of Defence Studies and Analysis (IDSA), September 11, 2017, 4, accessed November 10, 2017, https://idsa.in/policybrief/defence-reforms-why-is-it-critical-to-bite-the-proverbial-bullet_vchadha_110917.

paramilitary forces, central armed police forces (CAPF)[22], and the police forces are cooperating only at the functional level to achieve a basic level of cohesion. There is no national strategy to deal with the counter terrorist operations in a joint environment. The lack of unity of effort by the security forces is causing a failure to achieve economy of efforts in these operations. The lack of joint planning, joint training, joint doctrine, joint equipment (including procurement), joint intelligence and joint decision making is affecting the efficiency of the security forces especially the Indian Army to counter terrorism effectively.[23] At present each of the security forces has an individual intelligence cell and counter terrorist training establishment. Instead of cooperating with each other these security forces are competing with each other. Due to this competition, they are not sharing critical information. Therefore, there is a urgent requirement to establish a joint headquarter with a joint force commander to mitigate these problems.

He also states that conventional wars have been replaced with terrorism and hybrid wars. With India's nuclear capability, there is a likelihood that India is going to face a limited war which is going to be hybrid in nature. The likelihood of total war with Pakistan and China is fading away. With India's focus on a large standing Army, with multiple pivot and strike corps, their modernization efforts will be setback especially if the spending on the defense forces is maintained at the existing level of 1.55% of GDP.

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[22] Paramilitary and Central armed police forces: The Paramilitary forces refers to the Assam Rifles and the Rastriya Rifles while The Central Armed Police Forces (CAPF) refers to uniform nomenclature of five security forces in India under the authority of Ministry of Home Affairs. They are the Border Security Force (BSF), Central Reserve Police Force (CRPF), Central Industrial Security Force (CISF), Indo-Tibetan Border Police (ITBP), and Sashastra Seema Bal (SSB).

[23] Vivek "Defence reforms: why it is critical to bite the proverbial bullet?"

The scale of challenges and the limited availability of resources will lead to shortages of critical weapons, equipment, sights, Special Forces capabilities, modern surveillance resources, and modern training infrastructure. Although he highlights the organizational drawbacks, he has not suggested any organizational change for the Indian Army.

Chadha offers six guidelines for major structural changes in the Indian Army. Firstly, he focuses on the enhancement of the teeth-to-tail ratio as a critical aspect in Army modernization. Whereas for the operational area this ratio is sufficient, it would require a relook into peace stations. The Indian Army can save a lot of funding by streamlining its logistics components. The money saved can be used for the modernization of Indian Army. However, for optimum benefits the decision to reduce numbers across the armed forces must be linked to all the three services, the Department of Defense (DoD), the ordinance factories, other Public Sector Undertakings (PSUs) and the Defense Research and Development Organization (DRDO).[24] Although this point does not look attractive, it is likely to provide dividends in the long term. However, reducing the logistics without proper planning will not reap any benefits.

The second and most important recommendation by Chadha is the cohesion and theaterization of logistic corps amongst the three services.[25] The revolution in logistics should include improving quality control and increasing the efficiency of Ordinance factories, which has been a cause for concern for Army leadership. The reforms in

[24] Vivek, "Defence reforms: why it is critical to bite the proverbial bullet?"

[25] Theaterization of logistic corps: At present logistic corps support formations from division till theatre command. This was an organization when the roads and railways network were not build adequately. With the present state if highways and rail network in India, the logistics corps should be organized to support a theatre.

logistics include streamlining logistics, ordnance factories, and quality assurance related endeavors to enhance efficiencies and economy through greater cohesion. The reduction of teeth-to-tail ratio should include cutting down the numbers of logistic support elements along with the establishment of a joint services logistics capability to achieve economies of scale. The present system of echelon support is based on an old system where the roads, railways and the air modes of transportation were not developed. With improvements of communication networks and the availability of civil facilities all across the country, the existing echelon and establishments of ordinance and supply need to be revised.

Similarly, he argues that one of the most critical strategic tools that is lacking in the Indian Army is a Special Forces command, with the ability to undertake operations beyond the tactical domain. This is imperative in an environment where "punitive, clinical, offensive actions" may need to be undertaken without resorting to a large-scale deployment of forces in conventional mode.[26] Although all services have well-trained special forces, they are under the command of their respective service headquarters. A centralized Special Forces command could coordinate the capabilities of all the services special forces. This will reduce duplication of effort and enhance the capabilities of Special Forces. Finally, he highlights the importance of holistic and homogenous defense reforms. The same point is also highlighted by Lieutenant General P C Katoch in his article in 'the citizen.'[27] They argue that any attempt of piecemeal implementation is

[26] Vivek, "Defence reforms: why it is critical to bite the proverbial bullet?" 6.

[27] Lt. Gen. P. C. Katoch, "Peacemeal Army Reforms Demonstrate Lack of Strategic Sense," *The Citizen*, August 31, 2017, accessed January 3, 2018,

unlikely to yield the desired benefits and dividends. In his fifth point Chadha states that political leadership should take the onus and responsibility of leading the reforms. The political leadership should highlight national security concerns and envisaged capabilities. The Army should then provide a blueprint for achieving those capabilities. Past experiences have indicated that successful reforms have been achieved by taking the professional advice of the services backed by the willingness of political leaders to enforce implementation. A strong political direction in the form of a National Security Strategy will enable the organizational reforms in a timely manner.

Finally, his article recommends that the success of defense reforms hinges on the availability of financial resources. The defense budget in terms of percentage of GDP is unlikely to increase in near future. Therefore, the scope and size of reforms must be tailored to the needs of specific modernization targets, even if these are achieved sequentially rather than concurrently. As an illustration, if counter terrorism operations are identified as a priority area, the focus of reforms initially must be towards it, rather than thinly spreading precious resources and money across the Army.

Many other defense experts like Gurmeet Kanwal also feel that the Indian Armed Forces must be prepared to deal with a two-front war. Kanwal argues that the unresolved territorial and boundary disputes with China and Pakistan and the close economic ties between these two countries are the main reasons. He also states that China is also engaged in the strategic encirclement of India through its nuclear and missile nexus with Pakistan; the sale of military hardware to Bangladesh, Nepal, Myanmar, and Sri Lanka;

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http://www.thecitizen.in/index.php/NewsDetail/index/1/11607/Piecemeal-Army-Reforms-Demonstrate-Lack-of-Strategic-Sense.

and a string of pearls strategy Intended on surrounding India with naval bases in the northern Indian Ocean region.[28] Many Indian defense analysts predict that in the event of a conflict with China, Pakistan will try to take advantage of the situation and open up a new front.

At strategic level, both India and China are trying to resolve the disputes peacefully. There are regular meetings between India's National Security Adviser (NSA) and China's vice foreign minister, annual meetings between the heads of state, and military confidence-building measures and exercises between the Armed forces. The bilateral trade between the two countries continues to rise and has increased to $80 billion in the year 2017. Both countries are cooperating in international forums like the World Trade Organization and the UN Climate Change Conference. However, the relationship remains contentious due to Chinese aggressive actions at the borders with India and its negative stand regarding issue of visas for Indian citizens. For example, China refuses to issue proper visas to Indian citizens from Arunachal Pradesh, Beijing denied the commander-in-chief of India's Northern Command a visa for an official visit because it believes that Jammu and Kashmir is a disputed territory. Similarly, the People's Liberation Army (PLA) has been making frequent forays across the Line of Actual Control into Indian territory simply to push Chinese territorial claims.[29] China has also rapidly developed military infrastructure in Tibet to allow for quicker deployment of

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[28] Kanwal, "India's Military Modernisation: Plans and Strategic Underpinning," 2.

[29] Indrani Bagchi, "China denies visa to top General in charge of J & K," *TNN*, August 27, 2010, accessed December 20, 2017, https://timesofindia.indiatimes.com/india/china-denies-visa-to-top-general-in-charge-of-JK/articleshow/6442437.cms.

troops throughout the border areas with India along with their sustainment over a longer period of time. Similarly, the large Chinese presence in the Gilgit-Baltistan area of Pakistan-occupied Kashmir is causing increased tensions between the two countries as it is Indian territory illegally occupied by Pakistan. These issues have undermined much of the progress made in building a good relationship and are a cause of concern for India, as these developments do not contribute to long-term peace and stability.

Small conflicts between the Chinese PLA and the Indian Army along the borders have forced India to prepare for a possible confrontation with China. Many defense experts feel that a confrontation between India and China could be seen as an opportunity for Pakistan. If Pakistan reacted it could lead to a two front war while the Indian forces are already engaged in fighting an ongoing "half front" internal security war (counter terrorist operations).At present the Nuclear deterrence is playing a vital role in preventing potential conflict (India, China and Pakistan are holding nuclear weapons), but the prevailing wisdom in India is that there is space for a conventional conflict below the nuclear threshold.[30]To counter these threats and act as a deterrence withdefense analysts and high ranking military commanders feel that India should take immediate measures to accelerate the pace of its military modernization. This will help reduce the capability gap with China, which is only a quantitative gap at present. However, this gap will increase if India does not start modernizing its forces. Likewise, the slender edge that the Indian Armed forces now enjoys over Pakistan in conventional terms is being eroded as Pakistan

[30] Bagchi, "China denies visa to top General in charge of J & K," 2.

is spending considerable sums of money on its military modernization under the pretense of fighting radical extremism.[31]

The Indian armed forces (with major role of the Indian Army) have kept the nation together through various crises, including four wars with Pakistan and one war with China, Pakistan's "proxy war" in Jammu and Kashmir since 1989–90, and insurgencies in many of the northeastern states.Whereas Chadha advocates for reduction in the numerical strength of the Indian Army, Gurmeet kanwal says that given its large-scale operational commitments on border management and counterinsurgency, the Indian Army cannot afford to reduce its manpower numbers until these challenges are overcome. Both these statements although contradictory, are important when looked at different perspectives. With modern surveillance equipment, extensive deployment of the Army is no longer needed. The procurement and manufacturing of the surveillance equipment and the use of modern intelligence networks will reduce the requirement for soldiers. However, the induction of modern equipment must precede the reduction in manpower. If we reduce the army's number without inducting the modern equipment, it may produce unfavorable results.

Kanwal also highlights the key areas of reforms related to modern weapons and equipment for the Indian Army. He says that the Indian Army needs to move gradually toward acquiring network-centric capabilities for effects-based operations so as to optimize the Army's full combat potential for defensive and offensive operations. Similarly, he proposes that the Indian Army needs to substantially enhance the operational capabilities of its army aviation, engineers, signal communications,

[31] Bagchi, "China denies visa to top General in charge of J & K," 2.

reconnaissance, surveillance, and target acquisition branches in order to improve the overall combat potential.[32]The Indian Army needs to acquire modern strategic and tactical level command and control systems for better synergy during conventional and sub-conventional conflict. Despite being the largest user of space, the Indian Army does not have a dedicated military satellite for its space surveillance needs. Cyber warfare capabilities are also at a nascent stage. The emphasis thus far has been on developing protective capabilities to safeguard Indian networks and command, control, communications, computers, intelligence, information, surveillance, and reconnaissance (C4I2SR) from cyber-attack. Offensive cyber capabilities are yet to be adequately developed. All these capabilities would make it easier for the Indian Army to undertake joint operations with multinational forces in all types of warfare.[33]

One of the most important reasons for the slow modernization of the Indian Army is the lack of a healthy domestic industrial base. India, inherited a large defense industrial complex after its independence in 1947. However, as a result of political apathy and non-violence as a core national identity coupled with a strategy of non-alignment, there has been a gradual neglect of these institutions. The war with China in 1962 opened the eyes of the political class who supported a rapid expansion & equipping of the armed forces thereby putting a focus back on the country's defense industrial complex. At present there are a total of 39 Ordnance Factories (with two more in the pipeline), nine Defense Public Sector Undertakings (PSUs), and a small but emerging private sector. In addition, there

[32] Kanwal, "India's Military Modernisation: Plans and Strategic Underpinning," 4.

[33] Ibid.

are 50-odd defense research and development laboratories under the Defense Research and Development Organisation (DRDO) responsible for design & development of armaments for the armed forces. The Indian defense industry produces a wide range of items ranging from small arms and ammunition to fighter aircraft, tanks, submarines, radars, frigates, and other defense-related items.[34] However, even after spending a large amount of revenue on these PSUs, the Indian Armed forces still relies on imports formodern weapons and equipment.[35] The high cost of modern weapons and equipment and limited budget has resulted in a lack of necessary modern military equipment to meet the Army's requirements. In 1994 the Government set up six task forces under the Ministry of Defense (MoD) to look into ways that could help India reform and strengthen a domestic defense industry.[36] To entice foreign investment and expedite weapons procurement, India opened up the defense sector to Foreign Direct Investment (FDI) in 2001. The new FDI policy permitted a maximum of 26% FDI in any Indian private sector defense investment. However, bureaucracy's distrust of the private sector, ambiguous FDI guidelines, and insufficient incentives dissuaded foreign companies from investing. The FDI in defense sector yielded a paltry $6 million over a decade. This forced the government to revise the defense FDI policy in 2014 and then in 2016. To grow the indigenous industrial base and to enhance private sector capabilities, the government has

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[34] Laxman Kumar Behra, *Indian Defence Industry: Issues of Self-reliance* (New Delhi: Institute for Defence Studies and Analyses, 2013), 9-12.

[35] Benjamin Elisha Sawe, "World's largest Importers of Military Arm," *Worldatlas*, April 25, 2017, accessed November 12, 2017, http://www.worldatlas.com/articles/world-s-largest-importers-of-military-arms.html.

[36] Ibid.

increased the FDI cap for private sector to 100 per cent (subject to government approval) in 2016.[37] As the Indian government seeks to develop a robust military industrial base, it has sought to further ease FDI regulations and revise procurement policies to promote greater collaboration between international defense manufacturers and the Indian private sector.[38]

Similarly, another important factor for slow modernization of the Indian Army is flawed procurement policies. India had no procurement policy till 2005. In 2005 the government introduced a Defense Procurement Policy (DPP), to speedup procurement of weapons and equipment for the Armed forces. The 2005 DPP formalized a key 'offset clause' intended to channel a portion of the contract value into developing Indian defense industrial infrastructure.[39] However, not a single contract was secured under the 2005 DPP, resulting in its revision in 2006, 2008, 2011, 2013, and most recently in 2016.[40] With DPP-2016, the Indian government is trying to attract the indigenous private sector and foreign firms and investors. The government'semphasis on 100% FDI allows Indian private firms to secure contracts with foreign manufacturers and allow them to sell their products manufactured in India to other countries. By using this strategy, the government

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[37] Keshay Kalra, "Challenges to defense modernization to India Industrial, bureaucratic and budgetary restraints," Asia and The Pacific Policy Society, August 18, 2017, accessed November 12, 2017, https://www.policyforum.net/challenges-to-defence-modernisation-in-india/.

[38] Ibid.

[39] Ibid.

[40] Ministry of Defence, Government of India, "Defence Procurement Procedure 2016," accessed March 31, 2018, https://mod.gov.in/dod/sites/default/files/Chapterdppn_0.pdf.

is expecting to secure some contracts to increase the defense industrial base and reduce dependence on imports. The DPP-2016 has given preferential treatment to "Buy (Indian)" and "Buy and Make (Indian)" categories of acquisition over "Buy (Global)".[41] Because Indian Companies may not have adequate capabilities in terms of technology, they are encouraged to partner with foreign companies for joint ventures and technology transfer arrangements. The recent interest of Lockheed Martin to manufacture F-16 and F-18 fighter aircraft in India is a good signal for the DPP-2016 and the 'make in India' initiative. However, these policies will require some time to realize their full impact on the defense industry and on the Indian economy.

The lack of an adequate budget allocation for the Indian Army is another setback to achieve the desired modernization targets. While India's defense budget has grown over the years, a closer look reveals that a considerable portion is spent on growing personnel costs, thereby limiting the resources available for the procurement of effective materials. A recent paper from the Stimson Center points out that the 'trend of rising personnel costs and shrinking capital funds will decelerate India's military modernization efforts.' Budgetary issues will also impact potential private sector involvement in defense. Without long-term contracts, certainty of volumes, an efficient selection process, transparency, and fair payment terms, there will be little incentive for private players to invest the huge resources required for defense production. The reduction of personnel numbers in all three services, DRDO, ordinance factories, and other defense PSUs together with the new FDI rules and DPP-2016 may help to resolve this issue.

[41] Ministry of Defence, Government of India, "Defence Procurement Procedure 2016," 1-2.

However, many defense experts also feel that India is modernizing its Army better than other developing countries (except China). In the past 10-15 years, India has modernized its army through substantial acquisition and indigenization of modern military technology and restructuring of army units. The modernization includes procurement of 330 T 90S main battle tanks (MBT) from Russia and additional 347 produced in India, procurement of M-777 A2 Ultra-Light Howitzers (ULH) from the USA, development of 'future Infantry Soldier as a System' (F-INSAS) project, andthe procurement of spike missile systems from Israel etc.[42]The Indian Army is also reorganizing its large and slow moving forces into smaller, mobile, terrain-relevant units. For this Indian Army has created eight 'Integrated Battle Groups'(IBGs). These IBG's consist of armor, mechanized infantry and artillery, and are able to respond instantaneously to threats on India's borders.[43] Another organizational reform is the creation of a mountain strike corps to counter any Chinese aggressive actions along the borders with India.[44]

Despite this sizeable modernization, the Indian Army faces issue of logistic constraints and hardware obsolescence. The Indian Army is the largest recipient of India's defense budget allocations. The Indian Army accounts for 85% of the total

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[42] Vivek Raghuvanshi, "India Clears Ultra-Light Howitzers Buy from US," *Defensenews*, June 25, 2016, accessed November 16, 2017, https://www.defensenews.com/pentagon/2016/06/25/india-clears-ultra-light-howitzers-buy-from-us/.

[43] Keith Sypott, "India's Military Modernisation: Assessing the impact on India's relative power and foreign relations," *Culture Mandala: The Bulletin of the Centre for East-West Cultural and Economic Studies* 11, no. 2 (January 9, 2015): 3, accessed November 18, 2017, http://epublications.bond.edu.au/cm/vol11/iss2/1.

[44] Kapil Patil, "India's New Mountain Strike Corps: Conventional Deterrence,"

manpower in the defense forces. However, compared to its size, the Army accounts for only 20%-25% of total capital expenditure. This is because a large majority of the Army's expenditure are dedicated for pay, allowances, rations, fuel, ammunition and maintenance costs. Additionally, even with the largest defense budget allocation, the Army faces large budget cuts of almost $8 billion USD to the Mountain Strike Corps.[45] The Army also faces the issue of delayed procurements, with helicopter acquisitions being the prime example. India stated its intention to acquire 400 helicopters in 2008, but continues to face substantial delays on both international acquisition and domestic production, with some projects even being scrapped. Beyond these logistical issues, much of the hardware of the Army has long been obsolete. [46]

The modernization of the Indian armed forces and the Indian Army should not be assessed only in terms of weapons and equipment. In modern warfare organizational structure enabling cohesive action by all three services is very important. The Indian Army has carried out many structural reforms since the year 2001. However, even after the recommendations of a parliamentary committee in 2001, there are many organizational reforms that are still pending. The most important aspect amongst them is the appointment of a Chief of Defense staff (CDS).[47] The CDS will act as a single point of contact between the defense forces and civilian leadership. It will enable joint

[45] Patil**.** **"**India's New Mountain Strike Corps: Conventional Deterrence."

[46] Sypott, "India's Military Modernisation: Assessing the impact on India's relative power and foreign relations," 3.

[47] Chief of Defense staff (CDS): Similar to Chairman joint chiefs of staff in the US Armed forces. CDS will be the principle military advisor to the cabinet or to the Prime minister/Raksha Mantri (RM).

planning, develop joint threat and capability development, work out national priorities, and joint emphasis of modernization of armed forces. The CDS will also reduce duplication of effort, competition amongst the services, and increase cohesion amongst military, bureaucracy, and Raksha Mantri. [48] Another benefit of this appointment is that it will also set in motion the creation of a joint service theatre command and other joint services appointments.[49] This will enable joint planning, joint training, joint logistics, and joint intelligence. The cohesion with other security forces like Border Security Forces (BSF), Central reserve police forces (CRPF) etc. will increase at the Operational level. Presently the Ministry of Defense is headed by Raksha Mantri and the important appointments are held by senior bureaucrats. After the creation of a CDS the appointments of senior officers for defense preparedness is another step for the defense reforms. The defense preparedness requires constant updating and allocation of resources. The appointment of senior officers within the MoD to look after all the planning aspects related to modernization, future planning, budget allocation etc. will ensure defense

[48] Raksha Mantri: It is a Hindi word for Minister of Defense. Minister of Defense is the head of the Ministry of Defense of the Government of India. They are often assisted by a Minister of State for Defense and less-commonly, the lower-ranked Deputy Minister of Defense. The defense minister additionally serves as President of the Institute for Defense Studies and Analyses, and as Chancellor of the Defense Institute of Advanced Technology and of the National Defense University.

[49] Institute for Defence Studies and Analyses, "Defence Reforms - Agenda for the New Government: Military Affairs and Defence Economics & Industry," Policy Brief, May 22, 2014, 1-3, accessed October 31, 2017, https://idsa.in/policybrief/Defence ReformsNewGovernment_centres_220514.

preparedness at all time. It will also provide the government with evaluated insight picture of the progress of modernization programs.[50]

The Institute of Defense Studies and Analysis (IDSA) policy brief also recommends the setting up of Defense Technology Commission (DTC) with requisite authority to take decisions regarding technologies required for the future and develop an interface with the defense industry.[51] The commission will be helpful in developing the necessary nuclear and space technologies in the country. The setting up of a National Maritime and National Aerospace Commission can follow in a later stage.[52] These commissions will have a focused approach for defense research and developments within a schedule and will put pressure on DRDO, Hindustan Aeronautical Limited (HAL) and other PSUs to deliver in a timely manner.

The Indian Army developed and released its first doctrine in 2004. Thereafter it has been revised at constant intervals. Similarly, the first joint doctrine was written in 2007 and the latest edition produced in 2017. Although this doctrine identifies the future vision for planning, modernization, and capability building; they lack a single strategic vision due to the absence of strategic guidance in the form of a National Security Strategy (NSS) and National Defense Strategy. The lack of strategic guidance can lead to adhocism in crucial planning and preparedness. A National Security Council (NSC) was

[50] Institute for Defence Studies and Analyses, "Defence Reforms - Agenda for the New Government: Military Affairs and Defence Economics & Industry," 2.

[51] Ibid.

[52] Ibid., 3.

formed on 19 November 1998.[53] The NSC consists of the Prime minister, Raksha Mantri, finance minister, home minister, minister of external affairs and the National Security Advisor (NSA).[54] The NSC has a strategic policy group which consists of Chiefs of Army, Navy, and Air force. However, after its formation NSC has not developed any strategic level guidance documents. This lack of vision from the strategic policy makers is one of the main reasons for the slow pace of modernization of the Indian Army and a lack of jointness amongst all the services. Strategic guidance issued by the NSC will drive interoperability amongst the services and enhance their decision making capabilities. The NSC should be made responsible for issuing NSS type document every four–five-year. A NSS could give guidelines to all the national security agencies and the government departments to ensure the coordination of the whole of government in the achievement of India's National Interests. Indian Army can issue its doctrine, modernization program, and policies based on the requirements from the NSS. This will also set goals for the modernization of the Army. It will drive political leadership and the bureaucrats responsible for allocating resources and budget development to achieve the goals set by the NSS.

[53] Dr. Kapila Subash, "India's National Security Council – A Critical Review," South Asia Analysis Group paper no. 123, May 10, 2000, accessed March 31, 2018, http://www.southasiaanalysis.org/paper123.

[54] Headquarters Integrated Defense Staff, Ministry of Defence, *Joint Doctrine Indian Armed Forces*, 2nd ed. (New Delhi: Ministry of Defence, April 2017), 33, accessed 20 March 2018, https://mod.gov.in/dod/sites/default/files/Chapterdppn_0.pdf.

Conclusion

India is carrying out the modernization of its Army, but when compared to its neighbor China, the pace is slow. Therefore, India needs to articulate a proper time based modernization policy for its armed forces and for the Indian Army. The modernization plans should focus on both the organizational modernization to increase jointness and modernization of weapons and equipment. With increasing tension with China along the borders, China's investments in Pakistan especially in the China-Pakistan economic corridor (CPEC), and Pakistan's contentious support for terrorism, the Indian Army and the Indian armed forces are required to focus their modernization plans for a two-front war. The 'make in India', 100% FDI in defense sector, and the DPP-2016 are positive steps towards achieving self-reliance in weapons production. However, the government must also focus on organizational reforms and the articulation of a well-defined National Security Strategy and National Defense Strategy.

CHAPTER 3

RESEARCH METHODOLOGY

Introduction

The previous chapter covered the literature available on the threats to India's security, requirements for modernization of the Indian Army to mitigate these security threats, challenges for modernization, and recommendations to overcome these challenges in order to build a modern Indian Army. This chapter will elaborate upon the choice of research methodology and reasons for choosing this methodology. This chapter will also cover how the research was carried out and the description of the method of analysis.

Selected Research Methodology

The research question is open ended. Understanding the topic requires collecting, understanding, and then analyzing the present situation and any shortcomings to recommend a set of formidable solutions. The question deals with a real world situation. It tries to find out the ways India can modernize its Army. There can be multiple solutions and therefore requires much research to identify the best possible solutions considering the resources available, budget, threats, and the political situation. It is difficult to capture the results quantitatively. However, a few aspects of the result like those dealing with the budget and time periods require quantitative analysis. Quantitative research is empirical, using numeric and quantifiable data. Conclusions are based on experimentation and on objective and systematic observation. They may be divided into categories of experimental and non-experimental. The primary goal of experimental

research is to provide strong evidence for cause-and-effect relationships. Non-experimental research involves variables that not manipulated by the researchers and instead are studied as they exist. Quantitative variables can be measured across a scale, their numeric value has meaning, and they can be subjected to arithmetic operations.[55] Since, this research involves numerous factors; it has been carried out qualitatively. "Qualitative research begins with assumptions and the use of interpretive/theoretical frameworks that informs the study of research problems addressing the meaning individuals or group ascribe to social or human problems. To study this problem, qualitative researchers use an emerging qualitative approach to inquiry, the collection of data in a natural setting sensitive to the people and the places under study, and data analysis that is both inductive and deductive and establishes pattern and themes."[56] The research involves the policy formulation, strategic level shortcomings and ways to improve them. This qualitative research focuses on the following:

1. Evaluating the present security threats to India and the requirements for the Indian Army to mitigate these security threats. Then obtaining information about

[55] Stephen D. Lapan and Marylynn T. Quartaroli, "Non-experimental quantitative research," in *Research Essentials: An Introduction to Design and Practices* (San Francisco: Jossey-Bass, 2009), 60-61.

[56] John W. Creswell, "Designing a Qualitative Study," in *Qualitative Inquiry & Research Design: Choosing among Five Approaches* (Los Angeles: SAGE Publications Ltd., 2013), 44.

the current state of Indian Army and analyzing the modernization goals for the Indian Army to mitigate the security threats for India.[57]

2. Evaluating the problems to achieve the desired modernization goals and then recommending the feasible, acceptable, and suitable approaches to achieve the desired modernization goals.

3. Describing the economic aspect of modernization and availability of resources and budget to support the modernization of the Indian Army. This will involve quantitative analysis of a few aspects.

4. Collecting information from various sources, analyzing and interpreting the collected information.

5. Provide a holistic view of the security environment, economic condition, government policies, and draw conclusions on the potential solutions.

Tools for Research

Traditionally there have been two central theories describing international relations–realism and liberalism. Although they have been challenged by other theories, they remain central to the discipline.[58] The other theories of international relations that are not discussed by author include constructivism, feminism, post structuralism,

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[57] University of Southern California, "Organizing Your Social Sciences Research Paper: Qualitative Methods," accessed 29 March 2017, http://libguides.usc.edu/c.php?g=235034&p=1561755.

[58] Stephen Mcglinchey, Rosie Walters, and Dana Gold, "Getting Started with International Relations theory," in *International Relations Theory* (Bristol, England: E-international Relations Publishing, 2017), 4, accessed February 8, 2018, http://www.e-ir.info/2017/11/30/beginners-textbook-international-relations-theory/.

communism etc. In international relations realism emphasizes on the competitive and conflictual side of international relations. Realism assumptions are identified below.

1. The nation-state (usually called state) is the principle actor in the international relations. The power of other bodies like individuals and organizations are limited.[59]
2. The state is a unitary actor. National interests drive state actions.
3. Decision makers are rational actors and decision-making leads to the pursuit of national interest.
4. In realism, all leaders follow national interest in order to survive in the competitive world.
5. Finally, realism suggests states live in a context of anarchy, in the absence of anyone being in charge internationally.

Realists believe that their theory most closely describes the real world politics. They see the events like collapse of Soviet Union as exception to the normal pattern of things.[60] For realist, the highest goal is the survival of the state. Liberalism is a defining feature of modern democracy, illustrated by the prevalence of the term 'liberal democracy' as a way to describe countries with free and fair elections, rule of law and

[59] Sandrina Antunes and Isabel Camisao, "Realism," in *International Relations Theory* (Bristol, England: E-international Relations Publishing, 2017), 15, accessed February 8, 2018, http://www.e-ir.info/2017/11/30/beginners-textbook-international-relations-theory/.

[60] Ibid., 18.

protected civil liberties.[61] Liberalism is based on the moral argument that ensuring the rights of an individual to life, liberty and property is the most important goal of the government. Liberals emphasize the well-being of the individual as the fundamental building block of a just political system. A political system characterized by unchecked power, such as a monarchy or a dictatorship, cannot protect the life and liberty of its citizens.[62] Therefore, the main concern of liberalism is to construct institutions that protect individual freedom by limiting and checking political power. For liberals, the core problem is how to develop a political system that can allow states to protect themselves from foreign threats without subverting the individual liberty of its citizens. The primary institutional check on power in liberal states is free and fair elections. A second important limitation on political power is the division of political power among different branches and levels of government – such as a parliament, an executive and a judiciary.[63] Daniel Deudney and G. John Ikenberry (1999) describe three interlocking factors of liberal world.

1. International laws and agreements are accompanied by international organizations like the United Nations, to create an international system that goes significantly beyond one of just states.[64]
2. The spread of free trade and capitalism through the efforts of powerful liberal

[61] Jeffrey W. Meiser, "Liberalism," in *International Relations Theory* (Bristol, England: E-international Relations Publishing, 2017), 22, accessed February 8, 2018, http://www.e-ir.info/2017/11/30/beginners-textbook-international-relations-theory/.

[62] Ibid.

[63] Ibid., 23.

[64] Ibid., 24.

states and international organizations like the World Trade Organization (WTO), the International Monetary Fund (IMF) and the World Bank creates an open, market-based, international economic system.

3. The third element of the liberal international order is international norms. Liberal norms favor international cooperation, human rights, democracy and rule of law. When a state takes actions contrary to these norms, they are subject to various types of costs.

A core argument of liberalism is that concentrations of unlimited power are the threat to individual liberty. The primary means of restraining power are institutions and norms at both domestic and international level. This observer is not inclined towards any one theory of international relations. He views some aspects of international relations through the prism of liberalism while many aspects through realism. India is a democratic country with the power vested with the people. But China is communist and Pakistan has a weak democracy where military leaders have ruled the country as dictators. Therefore, India needs to develop a strong military power to protect its people. However, military power is limited by ensuring civilian control over the military. Hence, it is imperative for India to improve relations with China and Pakistan through soft power, but at the same time, develop military power to deal with any possible external threat.

The author will examine the threats to India and the required modernization goals for the Indian Army to mitigate these threats. He will use the operational design framework to develop feasible, acceptable, and suitable approaches to achieve the desired modernization goals. Operational design is the process of "conception and construction of

the framework that underpins a campaign or operation plan or order."[65] The framework is built upon a process that creates a shared understanding of the operational environment (OE); identifies and frames problems within that OE; and develops approaches, through the application of operational art, to resolve those problems, consistent with strategic guidance and/or policy[66]. Three distinct aspects in design include understanding the OE by identifying the current state and the desired end state, defining the problem to achieve the desired end state, and developing the operational approaches to mitigate the problem. Three distinct aspects in design include understanding the operational environment, defining the problem, and developing the operational approaches (See figure 2). The general methodology in operational design includes; "understand the strategic direction and guidance, understand the strategic environment (policies, diplomacy, and politics) understand the OE, define the problem, identify assumptions needed to continue planning (strategic and operational assumptions), develop options (the operational approach), identify decisions and decision points (external to the organization), refine the operational approach, and develop planning guidance".[67]

[65] Joint Chiefs of Staff, Joint Publication 5-0, *Joint Planning* (Washington, DC: Government Printing Office, July 16, 2017), IV-1.

[66] Ibid., IV-2.

[67] Ibid., IV-6.

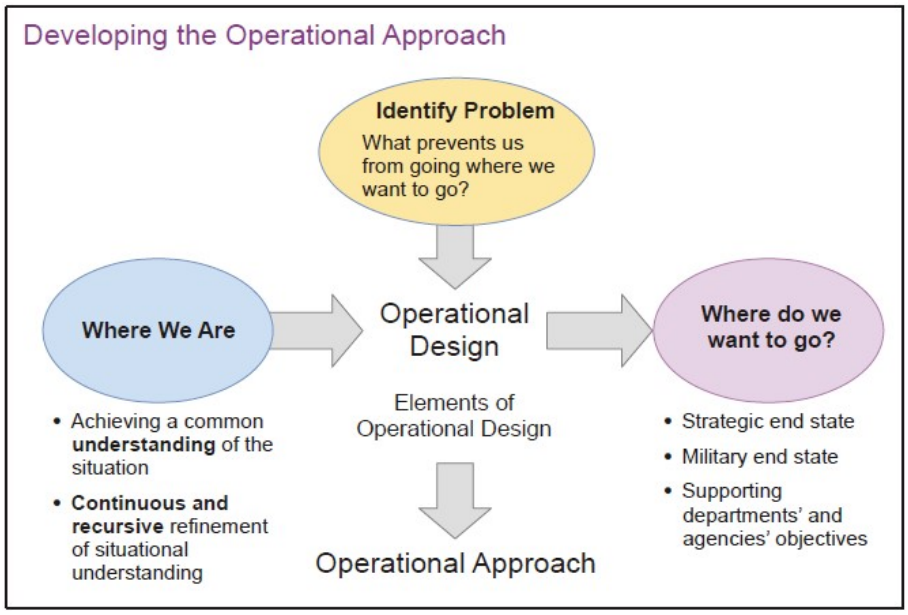

Figure 2. Developing the Operational Approach

Source: Joint Chiefs of Staff, Joint Publication 5-0, *Joint Planning* (Washington, DC: Government Printing Office, 16 June 2017), IV-2.

In this thesis, the current environment is the analysis of current security threats to India, current state of the Indian Army to deal with these threats, and the current state of various modernization programs. The desired end state will be "to develop the Indian Army into a modern Army with modern organization, technologically advanced weapons and equipment and well trained soldiers capable of fighting and winning all forms of warfare against all the enemies in a joint environment in order to achieve National Military Objectives." Then the author will identify the obstacles (problems) that are required to overcome to achieve the desired end state. In the end, the author will analyze suitable approaches that can be taken to achieve the desired end state. Each approach will be validated against the screening criteria given by Richard Yarger's –Feasibility, Acceptability, and Suitability (FAS). Feasibility is an assessment of the strategic concept

(ways) given the resources available (means). Acceptability is determined by comparing the resources required (means) and the benefits to be achieved (ends). A military objective is suitable if, when achieved, it leads to a desired political or national security objective.[68] Finally after analyzing all the approaches the author will give his recommended approach to achieve the desired modernization end state.

Conclusion

The author will use the qualitative research methodology to analyze the current state of the Indian Army, desired end state, identify the problems to achieve the desired end state and then give his recommendations. Thereafter validating these approaches against Richard Yarger–Feasibility, Acceptability, and Suitability (FAS) criteria the author will give his recommended approach.

[68] H. Richard Yarger, "Toward a Theory of Strategy: Art Lykke and the U.S. Army War College Strategy Model," in *The U.S. Army War College Guide to National Security Issues, Volume I: Theory of War and Strategy,* 4th ed., ed. J. Boone Bartholomees, Jr. (Carlisle Barracks, PA: Strategic Studies Institute, U.S. Army War College, 2010), 48.

CHAPTER 4

ANALYSIS

As indicated in chapter 3, the author will use operational design to develop the operational approach towards the modernization of the Indian Army. It will include identifying the current environment, the desired end state, analyzing the problems to achieve the desired end state, and then analyzing the different approaches available to achieve the modernization end states. The current environment includes current security environment of India, the current state of Indian Army and the current state of modernization programs. The problems will include the analysis modernization policy, defense budget, modernization budget, lack of indigenous production of modern weapons and equipment, acquisition policy, absence of National security and defense strategies, and absence of joint command and control organizations. Finally, this chapter will analyze four options that if adopted can enable the Indian Army to achieve the desired modernization end state.

Current Environment

Current Security Threats

As discussed earlier, India is facing both conventional and non-conventional threats (training, arming, and financing of terrorists) from Pakistan. India is also facing a conventional threat from China mainly due to unresolved territorial disputes along its borders. Maoist insurgency, the rise of global terrorism, and Islamic state of Iraq and Syria (ISIS) are also few small level security threats to India. After its Independence in 1947, India declared itself as a democratic and secular country and the political

leadership focused on economic development to eliminate poverty, unemployment, and illiteracy. There was a little focus on modernization of the Armed forces. However, after the humiliation in 1962 war with China, the Indian political leadership realized the importance of a strong military in order to maintain the territorial integrity of the country and protect its citizens. This realization led to the expansion and modernization of the Indian Army. The victories in the 1965 and 1971 wars with Pakistan were a result of a stronger Armed forces with modern weapons and equipment. However, India continued to progress economically but the focus on modernization of the Armed forces faded away. Indian government has tried to resolve the territorial disputes with China diplomatically, however China has developed an aggressive stand in recent years. The Doklam standoff,[69] which lasted for 73 days (from 16 June to 28 August 2017), is an example of the disputes being escalated between the two countries. Similarly, China's expanding economic relations and strategic ties with India's neighbors is an effort to both contain Indian influence in the Indian ocean region and encirclement.[70] Although the threat from Pakistan is both conventional and unconventional, after India's decisive victory over Pakistan in 1971 and both countries acquiring nuclear weapons, the conventional threat has been reduced. Pakistan however has continued providing weapons, training and financial support to terroristorganizations. With the Indian

[69] Ministry of External Affairs, Government of India, "Expeditious Disengagement in Doklam," Press release, August 28, 2017, accessed March 10, 2018, http://www.mea.gov.in/press-releases.htm?dtl/28893/pressstatementondoklam disengagement understanding.

[70] Dr. Dale Stephens, "Naval Power in the Indian Ocean: 21st Century Opportunities and Challenges: Maritime Governance and the Indian Ocean" (Research Paper no. 16-08, Research Unit on Military Law and Ethics, Adelaide Law School, Adelaide, Australia, January 12, 2016), 2.

government taking a tough stand for negotiations with Pakistan (due to it supporting terrorists against India), a diplomatic solution to this threat is less likely. The threats from Maoist insurgency from within India is considered an internal security threat and paramilitary and police forces are involved to control it. ISIS is currently engaged in the radicalization of Indian youths to fight in Syria.[71] Therefore, the Maoist Insurgency and ISIS radicalization is not a threat which requires the Indian Army's attention. However, the conventional threat from China and Pakistan and the terrorists' activities supported by Pakistan are a threat that requires Armed forces attention. Except for a threat in the Indian Ocean region from China, the Indian Army will play a dominant security role in India. When compared to China's massive defense budget and its focus towards modernization of PLA, it is important for India to modernize its armed forces with specific focus on the Indian Army.

Current State of the Indian Army

The Indian Army is the fourth strongest Army in the world.[72] It is also the third largest army with 1.2 million active duty personals.[73] The Indian Army has fought four wars with Pakistan and one with China. It possesses state of art weapons and equipment

[71] Natalie Tecimer, "India and the fight against the Islamic State," *The Diplomat*, 14 June 2017, accessed March 10, 2018, https://thediplomat.com/2017/06/india-and-the-fight-against-islamic-state.

[72] Logan Nye, "The Top 10 Militaries of the World in 2017," Military, August 4, 2017, accessed March 19 2018, https://www.military.com/undertheradar/2017/08/top-10-militaries-world-2017.

[73] Global Fire Power, "Total Available Active Military Manpower by Country," 2017, accessed March 18, 2018, https://www.globalfirepower.com/active-military-manpower.asp.

and is on a path of modernization to emerge as a modern twenty-first century army. The Indian Armed forces possess 2101 aircrafts (1485 attack and fighter aircraft), 4,426 tanks, 6,704 armor fighting vehicles, 7,414 towed artillery, 292 rocket artillery and 290 self-propelled artillery, 3 aircraft carriers, 15 submarines, 14 frigates, and more than 150 other important naval vessels.[74]

In the beginning of the twenty-first century, the Indian Army's primary focus was to deal with counter terrorist operations in Jammu and Kashmir and few North-East states and domination of line of control along Pakistan in Jammu and Kashmir. However, recent intrusions (last 5-6 years) by the Chinese PLA along the Indian borders and the Chinese heavy investment into the China Pakistan economic corridor and the port in Gwadar have changed the thinking of the senior military leaders. The focus of the Indian Army is shifting towards capability to prepare for a two front conventional war (with China and Pakistan), while fighting terrorism throughout. With the Chinese modernization program, its progress and the Chinese advantages over India in nuclear, missile, and military hardware, China poses the most potent military threat to India.[75] With ageing Air Defense systems and reduced Indian Air force squadrons, the current state of air defense is very thin. To overcome this, India is negotiating with Russia to procure "S-400 Triumf" long-range surface-to-air missile systems and DRDO is

[74] Global Fire Power, "Country Military Strength Details: India," 2017, accessed March 18, 2018, https://www.globalfirepower.com/country-military-strength-detail.asp?country_id=india.

[75] Abhinav Dutta, "India's Defence Modernisation: Challenges and Prospects," *Indian Defence Review*, July 7, 2016, accessed March 19, 2018, http://www.indiandefencereview.com/news/indias-defence-modernisation-challenges-and-prospects.

developing the indigenous ballistic missile defense (BMD) system. The armor corps has acquired T-90 S and Arjun tanks however; there is a requirement to replace the old fleet of T-72 tanks with the T-90 or Arjun tanks. With the requirements for tanks in the northern borders, India needs to increase its pace of the modernization program for armor regiments. The Army aviation consists of only light lift and old recon helicopters. The government has approved the acquisition of three squadron of new generation Apache attack helicopters and the joint development of Kamov helicopters with Russia. Army aviation needs to integrate attack helicopters into operations like the United States. The Indian Army has a large infantry force capable of fighting and winning all types of conventional and non-conventional battles. However, the soldiers require new generation light weight assault rifles, body armor, helmets, new generation weapon sights and hand held thermal imagers (HHTI), anti-tank guided missiles (ATGM), mortars, radio sets, and better back packs. Indian soldier possesses the old INSAS rifle, with limited capability in night sights, old and technologically backward ATGMs and HHTIs.

To achieve jointness amongst the armed forces India formed two joint commands namely the Andaman and Nicobar Command (ANC) and Strategic Forces Command (SFC); formed headquarters Integrated Defense staff (IDS);however, there is an urgent need to establish joint special forces, logistics, cyber and space commands and integrate individual services theatre commands into joint theatre commands. Another important step lacking in the Indian Armed forces is the appointment of a Chief of Defense Staff (CDS).[76]

[76] CDS: Similar to the US Chairman of Joint Chief of Staff.

India is spending approximately $45-50 billion in the defense budget, which accounts for 1.6-1.8 percentage of its GDP (China spends $174.5 billion in defense budget).[77] With India being a developing country, it is very difficult for the government to increase its spending on the Armed forces especially the Indian Army. The defense budget for 2018-2019 was only 1.58 percentage of the GDP which was the lowest since the 1962 war with China.[78] With a larger portion of the defense budget being spent on revenue, the amount required for capital expenditure has not increased. The Indian Army is trying to reduce its force size in order to increase its "teeth-to-tail" ratio which will reduce its revenue budget thereby allowing an increase in the capital budget.

Current Modernization Programs of the Indian Army

The future planning for modernization of the Indian Army is stated in Long term integrated perspective plan (LTIPP) 2012, covering a period up to 2027.[79] After analyzing the proposed LTIPP 2012-2027, the hostile neighborhood, and a rise in terrorism, the present pace of modernization looks very slow both for organizational

[77] Rajeshwari pillai Rajgopalan, "China's 2018 Military Budget: New Numbers, Old Worries," *The Diplomat*, 7 March 2018, accessed March 10, 2018, https://thediplomat.com/2018/03/chinas-2018-military-budget-new-numbers-old-worries.

[78] Shaurya Karanbir Gurung, "Budget 2018: Defence sector gets a boost by 7.81%," *Economic Times*, February 1, 2018, accessed March 18, 2018, https://economictimes.indiatimes.com/news/defence/budget-2018-defence-sector-gets-a-boost-by-7-81/articleshow/62746419.cms.

[79] Major General P. K. Chakravorty (Retired), "Indian Army: Modernisation and Current Status," *India Strategic*, January 2015, accessed March 20, 2018, http://www.indiastrategic.in/topstories3648_Indian_Army_Modernisation_and_Current_Status.htm.

modernization and modernization of weapons and equipment. With the rapid pace of modernization of Chinese PLA, India need to relook its modernization program.

Current Modernization State of Weapons and Equipment

The Infantry

The Indian Army has started the process to acquire and equip the Infantry soldier with modern rifle, machine gun and carbine. The F-INSAS (Future Infantry Soldier as a System) program is focused to provide an infantry soldier with a state-of-the-art weapon system and combat gear. Its first phase of this is scheduled to be completed by 2020. This system consists of a four major weapon and equipment systems namely a multi-caliber personal weapon system with an under barrel grenade launcher, a thermal weapon sight and a laser range finder; a helmet with a mounted flash light, thermal sensors, night vision capability, digital compass, video cameras, computer, audio headset, and nuclear, biological and chemical (NBC) sensors; a visor with integrated information with a head up Display monitor, light weight bulletproof jacket; and the accessories like palmtop devices with secure communications and integrated with Battle Management Systems. The program has already seen a large number of setbacks and it is doubtful that DRDO will be able to deliver it by 2020.

Digital Battlefields

The Indian Army has started focusing on network centric warfare (NCW) to enhance Information sharing, improve situation awareness, speed of command and enhanced mission effectiveness. However, the speed of digitization of Indian Army is very slow. The most important NCW system being developed is Command Information

Decision Support System (CIDSS) which comprises Tactical Command Control Communications and Information System (Tac C3I), the Artillery Combat Command and Control System (ACCCS), Battlefield Surveillance System (BSS), Air Defense Control & Reporting System (ADC&RS), Electronic Warfare System (EWS) and Electronic Intelligence System (ELINT). The Tac C3I system is responsible to provide state of the art connectivity from the Corps HQ and below, whereas Army Strategic Operational Information Dissemination System (ASTROIDS) is responsible to provide the upward connectivity from Corps HQ to Army HQ. However, there is no plan to provide connectivity at unit and sub-unit level. Appropriate sensors, platforms, weapon systems integrated with individual soldiers to enable them to exploit their assets and translate plans into synergized operations at the lowest level are needed at the earliest. There is also a plan to develop a battlefield management system (BMS) to provide real/near real time situational awareness and information exchange between the unit commanders and their individual soldiers to enable optimal management of resources within the Tactical Battle Area (TBA). The BMS will provide a Common Operating Picture (COP) and Situational Awareness to all entities in the TBA. Further the BMS will also produce a COP within a Geographic Information System (GIS) reference framework and provide Blue Force Tracking (BFT) using satellite navigation systems. Further the systems will be capable of quick deployment and have the capability to disseminate position reports in a GPS-disabled environment, relying on an alternative indigenous navigation system.[80]

[80] India is developing its indigenous regional GPS system called IRNSS. It was proposed to be active by 2018, however due to some satellites mal functioning, the system is in the process of development.

Notably, Phase 1 of ACCCS has been completed with some observations. Tac C3I and BSS are in the final test bed. EWS, ELINT and ADC&RS are in the process of development. The Defense Acquisition Council (DAC) of the Ministry of Defense (MOD) has cleared the BMS as a "Make (India)" project in 2006 under the Defense Procurement Procedure (DPP) and commissioned an Integrated Project Management Team (IPMT) to do a study. This was followed by an Expression of Interest (EOI) sent to more than a dozen Indian defense companies, both private and state-run. Only domestic companies have been allowed to compete but they will be free to seek foreign technologies. The prototypes were supposed to be ready by 2017 and be inducted by 2020.[81] However, the projects have not yet been sanctioned.

The Army is also modernizing in the field of surveillance and sensors. The Indian Army has acquired Unmanned Aerial Vehicles (UAVs), Battle Field Surveillance Radars, Weapon Locating Radars, Long Range Reconnaissance and Observation System (LORROS), Thermal Imaging Intensification Observation Equipment (TIIOE), N Cross night vision equipment, Hand Held Thermal Imaging (HHTI) equipment, night vision binoculars and Unattended Ground Sensors. The total number of these systems are lessthan what the army requires however, it is pushing to increase the numbers. The development of Rustom UAV (I, II, and III) by DRDO is a step to develop an indigenous UAV platform.

[81] Chakravorty, "Indian Army: Modernisation and Current Status," 4.

Armor and Mechanized Infantry

Indian Army is trying to modernize its armor and mechanized infantry. The Russian third generation T-90 S are the latest tanks within the Indian Army's inventory. These tanks are now being produced in India and by 2020, India should have a total of 2,011 T-90 tanks spread across 40 Armored Regiments.[82] The Indian Army has also upgraded its 1,600 T-72 tanks with night vision devices. The Army is also planning to replace its old tanks with the new indigenous Arjun tanks, which is heavier than the T-90 but has a 120mm gun which fires APFSDS, HEAT, High Explosive (HE) and High Explosive Squash Head (HESH) rounds. The latest version Arjun Mk II is undergoing trials with about 75 modifications. However, there remains a need to procure/develop light tanks for deployment along the Indo-Chinese border in steep and high mountains.

The BMP-2 is the Army's main Armored Personnel Carrier (APC). It is equipped with a 30 mm cannon and fires the Konkurs missile, made by Bharat Dynamics Limited (BDL) under license from Russia with a range of 4 Km. A decision has been made to upgrade the 1,600 BMP-2s with a 350 Horse Power (HP) engine. The Indian Army also has 700 BMP-1s in active service. There is no program in the future to upgrade the APCs.

Artillery and Air Defense

The artillery and air defense have been the most neglected branches of the Indian Army for two decades. The 155mm Bofors guns are the main medium guns within the Indian Army, which were inducted in 1980s. Ordnance Factory Board's(OFB) 155 mm (45 caliber) has successfully passed the trials. However, it is still not getting inducted

[82] Chakravorty, "Indian Army: Modernisation and Current Status," 4.

because of technical problems. The Indian Army is also procuring the 155mm Ultra-light howitzers (ULH) from USA. These are insufficient to meet the requirements of all the artillery regiments of the Indian Army. Similarly, the Army air defense is an extremely important arm tasked with providing low level air defense in the Tactical Battle Area (TBA). However, their equipment is more than three decades old. Although, two Regiments of indigenous 'Akash' Missiles have been ordered from DRDO, the numbers are insufficient to provide substantial air defense cover. There are trials going on for Very Short Range and Short Range missiles and their induction is likely to take place by 2020.[83] The government is also considering procurement of the S-400 air defense systems from Russia.

Other High Technology Areas

There is research being carried out in artificial intelligence, robotics, nano technology, non-lethal weapons, directed energy weapons and NBC warfare. Artificial intelligence and robotics are in a nascent stage of development. India needs to push for increased developments in the field of nano technology, potentially leading to a reduction in size and weight of equipment, which would enhance their suitability for high altitude and glaciated regions. Direct energy weapons are being developed by China and India needs to expedite their development. As a peaceful country India had established a NFU (No-First-Use) doctrine for nuclear weapons. However, the new joint doctrine published in April 2017 states that the Indian Armed forces will maintain nuclear weapons to insure a credible deterrence. This is the first change in doctrine for the use of nuclear weapons

[83] Chakravorty, "Indian Army: Modernisation and Current Status," 5.

since their induction. This change in doctrine also requires the Indian Army to develop advanced delivery and command and control systems.

Current State of Organizational and Strategic Modernization

Defense Budget

India's defense budget has increased over the years. However, when compared to the percentage of GDP being spent on the defense budget the figure has declined since 2012. India has emerged as the fastest developing economy amongst the world's major developing economies.[84] In 2017-18, India's GDP was $ 2.65 trillion. However, even with rising GDP, the defense budget for 2017-2018 was Rs 2,79,000 crore ($ 43.4 billion).[85] This is only 1.56 percent of the GDP. Although the total amount has increased from the previous year, but taking into consideration inflation and the rise in GDP, it is lowest in terms of GDP percentage since 1962. The declining percentage is a cause of concern; in every passing year the revenue budget is increasing whereas the capital is remaining same. The government allocated $13 billion for the capital budget in 2018-19 as against the projected $21.96 billion.[86] This decline in the capital budget is likely to affect several procurements and contracts in the pipeline in this year. In the year 2016-17, the defense budget was 2.25 % of GDP, but that was due to an increase in revenue

[84] Salvatore Babones, "India Is Poised To Become The World's Fifth Largest Economy, But It Can't Stop There," *Forbes*, December 27, 2017, accessed March 20, 2018. https://www.forbes.com/sites/salvatorebabones/2017/12/27/india-is-poised-to-become-the-worlds-fifth-largest-economy-but-it-cant-stop-there/#fa613123ff1d.

[85] Laxman K. Behra, "India's Defence Budget 2017-18: An Analysis," Institute of Defense Studies and Analysis, February 3, 2017, accessed March 20, 2018, https://idsa.in/issuebrief/india-defence-budget-2017-18_lkbehera_030217.

[86] Ibid.

expenditures (the government announced 'one rank one pension' scheme).[87] The capital expenditures still remained the same the previous year.

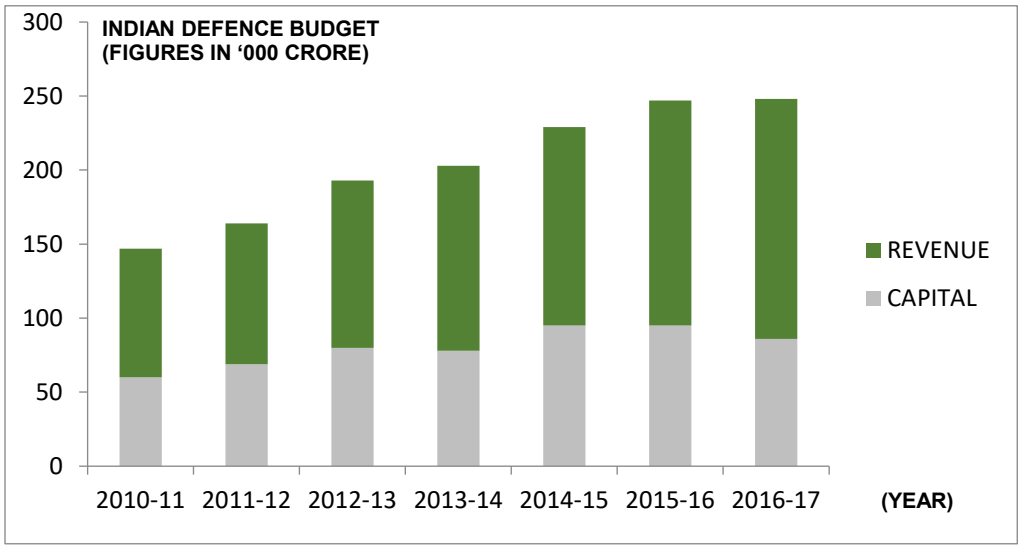

Figure 3. India's Defense Budget

Source: Institute of Defence Studies and Analysis, "India's Defence Budget 2016-17," 3 March 2016, accessed 28 March 2018, https://idsa.in/issuebrief/pay-and-perks-india-defence-budget-2016-17_lkbehera_030315.

The analysis of defense budget for the last five years indicates that India's defense budget will not increase in terms of percentage of GDPfor the next 5-10 years. Indian parliamentary panel had recommended at least a $100 billion capital expenditure to modernize the Indian armed forces. However, with no increase in capital expenditure it will be difficult to achieve the required modernization goals. The government is promoting policies of "make in India" and allowing 100% FDI in defense sector to

[87] OROP (One Rank One Pension): The approval given by government to give same pension to Armed forces personal retired at same rank with same years of service. Earlier the pensions were different.

increase indigenous production of weapons and equipment. However, these policies are still in a nascent state and no big defense deals have been signed since the DPP-2016 was published (raising FDI to 100%). The recent reports of Lockheed Martin willing to produce fighter aircraft in India is seen as a positive step towards reducing capital expenditure on foreign procurement.[88]

Indigenous Production of Weapon and Equipment

The quantity, quality, and type of indigenous production of weapons and equipment in India is below the desired standards. Even with a total of 39 Ordnance Factories (with two more in the pipeline), nine Defense Public Sector Undertakings, and 50-odd defence research and development laboratories under the umbrella of Defence Research and Development Organisation (DRDO) India has not been able to reduce its dependence on external procurement of weapons and equipment. Currently, Indian defense industries are producing a wide range of items ranging from small arms and ammunition to fighter aircraft, tanks, submarines, radars, frigates, and other defense-related items. However, most of these defense industrial complexes fall under the category of state-owned enterprises which are the sole established players in the armament sector and had exclusive rights for defense manufacturing till 2001.

With public sector industries not producing any high technological weapons, the government opened the defense industry to the private sector in 2001. The private sector was allowed to produce any defense item, with FDI up to 26 per cent. These provisions

[88] Lockheed Martin, "Lockheed Martin, Tata Announce F-16 India Partnership," 2017, accessed March 27, 2018.https://news.lockheedmartin.com/2017-06-19-Lockheed-Martin-Tata-Announce-F-16-India-Partnership.

were, however, subject to industrial licencing and security clearance. The big success for the private sector came in May 2011 when the private shipyard, Pipavav Defense and Offshore Engineering Company (formerly Pipavav Shipyard), won a fiercely contested naval order valued at Rs 2,975 crore (approximately 458 million dollars) for building five naval offshore patrol vessels (NOPV) for the Indian Navy.[89] Pipavav was competing with the state-owned shipyard, GSL, which has expertise in building similar vessels. The success with the Naval contract was repeated in an army contract in early April 2013, when a consortium of two private firms – L&T (Larsen and Toubro) and Ashok Leyland –emerged as the lowest bidder in a Rs 100 crore (approximately 15.4 million dollars) tender for refurbished rocket launchers mounted on specialised trucks for the Indian Army. Similarly, the Tata Power's Strategic Electronic Division won the contract for the modernisation of 30 Indian Air force airbases.[90] The first major success for the Indian private sector in international arms market came in 2012, when Pipavav secured a major export order valued at Rs. 1192 crore (approximately 184 million dollars) from an undisclosed West African country for the supply of two Offshore Patrol Vessels.[91] Some

[89] Pipavav Defence and Offshore Engineering Company Limited, "Annual Report," 2010-11, 2, accessed March 27, 2018, http://www.rnaval.co.in/web/rnaval/company-profile. Now the company is called as Reliance Naval and Engineering Limited (RNAVAL).

[90] Tata Power SED, "Tata Power's Strategic Electronics Division bags prestigious Order to modernise Airfield Infrastructure for the Indian Air Force," Press release, April 11, 2012, accessed March 28, 2018.http://www.tatapowersed.in/newsroom/press-releases-11-april-11.html.

[91] Press Trust of India, "Pipavav Defence bags international orders worth Rs 1,192 crore," Press release, August 7, 2012, accessed March 28, 2018, https://defenceforumindia.com/forum/threads/pipavav-bags-opv-contract-in-west-africa.40528/.

companies have even gone to the extent of acquiring foreign defense oriented companies. An often cited example of such a partnership is the joint venture (JV) company formed by India's Mahindra Group with the UK's largest defense company, BAE Systems. The JV, with an initial strength of 50-60 people, was initially intended to produce a range of military vehicles. With regard to the acquisition of foreign companies, in December 2009, the Mahindra Group acquired a majority stake in two Australian defense companies, Aerostaff Australia and Gippsland Aeronautics, signalling its entry into the defense and aerospace business.[92]

Make in India

The Indian defense industry's import-export ratio is inferior to countries with a much smaller defense industrial base. The 'Make in India' policy for the defense sector aims to reverse the current imbalance between the import of defense equipment and indigenous manufacture of defense equipment without adversely affecting the requirements, capability, and preparedness of the user. The requirement for domestic production of defense equipment is more important than for any other sector because it will not only save precious foreign exchange but will also address national security concerns. The 'Make in India' policy aims at facilitating investments and fostering innovations in the manufacturing sector of India. The Government policy of promoting domestic defense industry is adequately reflected in the latest Defense Procurement Policy (DPP-2016), wherein preferential treatment is given to the "Buy (Indian)" and

[92] Mahindra Rise, "Mahindra soars into the aerospace segment: Acquires majority stake in two Australian companies," Press release, 2009, accessed March 31, 2018. http://www.mahindra.com/news-room/press-release/1294651718.

"Buy and Make (Indian)" categories of acquisition over "Buy (Global)". As Indian Companies may not have developed adequate capabilities in terms of technology, they are encouraged to partner with foreign companies for joint ventures, technology transfer arrangements and tie-ups. The recent interest of Lockheed Martin to manufacture F-16 and F-18 fighter aircraft in India is a good signal for the 'make in India' initiative. However, it will require some time to realize its full impact on the defense industry and on the Indian economy.

Acquisition Policy

The government of India had introduced an update to the Defense Procurement Procedure called DPP-2016. It encompassed most of the recommendations of the Dhirendra singh committee in order to ease acquisitions and also boost indigenisation.[93] A new category called indigenously designed, developed, and manufactured (IDDM) has been introduced with a priority of preference in acquisitions.[94] The major changes in the DPP-2016 were as follows.

1. Offset policy: The offset policy specifying offset requirements of a minimum of 30 percent value of the procurement of defense equipment, for equipment costing greater than Rs 2000 Crores (approximately 307 million dollars).[95]

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[93] Nampi Raj, "Steps Taken on Dhirendra Singh Committee Report," Press Information Bureau, Government of India, April 26, 2016, accessed March 28, 2018, http://pib.nic.in/newsite/mbErel.aspx?relid=142247.

[94] Ministroy of Defence, Government of India, *Defence Procurement Procedure 2016,* ch. 1, 2.

[95] Manohar Parrikar, "Make in India - Defence Sector," Press Information Bureau Government of India, January 28, 2015, accessed March 31, 2018, http://pib.nic.in/newsite/mbErel.aspx?relid=114990.

2. Licensing: The procedure for granting Industrial licences for the production of defense equipment has been codified. Also the initial validity period for granted Industrial licences has been extended from seven to fifteen years.[96]
3. Defense Security Manual: This security manual has been issued by DoD to clarify the security apparatus to be adopted by the industrial units involved in the manufacture of sensitive defense equipment.
4. Strategic Partnership Model: The strategic partnership model seeks to identify a few Indian private companies as Strategic Partners who would initially coordinate with a few shortlisted foreign OEMs to manufacture big-ticket military platforms.97 In the initial phase, the selection of Strategic Partners would be confined to four segments: Fighter Aircraft, Helicopters, Submarines, andArmoured Fighting Vehicles (AFV)/ Main Battle Tanks (MBT). In each segment"only one Strategic Partner would generally be selected." According to the guidelines stipulated in the new Chapter VII of DPP 2016, any applicant company interested in participating in the selection process for strategic partners must be owned and controlled by resident Indians.[98]
5. Incentives: The newly introduced 'IDDM' under 'MAKE' category provides great incentives like a tax rebate of 200 percent for any individual or industry that invests for Research & Development at a laboratory, institute or a

[96] Parrikar, "Make in India - Defence Sector."

[97] Ministry of Defence, Government of India, *Defence Procurement Procedure 2016.*

[98] Ibid.

national university.99 Similarly, many state governments are offering land at concessional rates along with tax rebates to industries investing in its Defense Industrial Special Economic Zone.

Current State of National Security Strategy and National Defense Strategy

A National Security Strategy and National Defense Strategy aredocuments produced by the government with the advice of the security forces to lay down the future policies related to the security and the defense of the country. The armed forces formulate their policies and strategies based on the direction provided in the National Security Strategy and the National Defense Strategy. India has faced both conventional and non-conventional threats since its independence. However, even after fighting one war with China and four with Pakistan, the Indian government has not articulated aNational Security Strategy or aNational Defense Strategy to deal with these threats. On 19 November 1998 the National security council (NSC) was formed to determine a national policy against national threats.[100] The NSC consist of the Prime minister, Raksha Mantri, finance minister, home minister, Minister of external affairs and the National security advisor (NSA).[101] The NSC has a strategic policy group which consist of the chief of Army, Navy, and Air force. However, after its formation the NSC has not issued any

[99] Ravi Singhania, "Make in India: An overview of Defence Manufacturing in India," Singhania and Partners, 2015, 10, accessed April 3, 2018, https://www.gita.org.in/Attachments/Reports/Make-in-India-Defence-Manufacturing-in-India.pdf.

[100] Kapila, "India's National Security Council – A Critical Review."

[101] Headquarters Integrated Defense Staff, Ministry of Defence, *Joint Doctrine Indian Armed Forces,* 33.

strategic documents to date. The Indian Army had published its first Indian Army doctrine in the 2004. It was the first attempt by the Indian Army to focus on future warfare. Thereafter the Indian Armed forces published a joint doctrine to increase the cohesion amongst all the services. The latest joint doctrine was published and released in April 2017. The joint doctrine covers nuclear deterrence options, joint operations by special forces, and future capability development of armed forces. However, unlike the United states of America, where the National Military Strategy is based on the requirements provided in theNational Security Strategy and National Defense Strategy, this doctrine is based on service requirements. This lack of vision from the strategic policy makers is one of the main reason for the slow pace of modernization of the Indian Army and the lack of jointness amongst all services.

Absence of Chief of Defense Staff (CDS) and Joint Theatre Commands

Organizational and strategic level modernization require a joint effort by all arms and services and cooperation between all security agencies of the country. In the Indian Armed forces, all three services have different Chiefs of staff, command headquarters, training cycles and policies, procurement policies and separate doctrine. All the services chiefs work under Raksha Mantri. There is no CDS (equivalent to the Chairman of the joint chief of staff for the US armed forces). India has established an organization called the Chiefs of staff committee (COSC), comprising of the chief of all three services.[102]The COSC provides advice to the Raksha Mantri and the senior most Chief is the chairman of the COSC. However, there is no joint commander of all the services. All three forces

[102] Headquarters Integrated Defense Staff, Ministry of Defence, *Joint Doctrine Indian Armed Forces,* 34.

work independently to fulfill their respective services requirements. The creation of a CDS will also set in motion the establishment of joint theatre commands. At present, all three services have their separate theatre command headquarters which are not geographically co-located. Similarly, all services provide their own procurement requirements and there is no central agency to determine the priority amongst these. An example of lack of cohesion is the demand for Apache attack helicopters by both the Indian Army and Indian Air force. Since there is lack of jointness, Indian Army wants to induct attack helicopters in its aviation fleet, whereas the Indian Air force does not want to relinquish its control. Similarly, at present utility helicopters are existing within the Indian Army as well as the Indian Air force. The existence of a CDS and joint theatre command headquarters will enable the CDS to prioritize all the resources like the US armed forces. In the USA, Army aviation controls the majority of all helicopters while the Air force controls the predominance of fixed wing aircrafts.

Joint Training and Joint Planning

Joint training is an important aspect of increasing the cohesion and interoperability amongst the three services and enables better utilization of available resources. The new Joint doctrine published in April 2017 is seen as one step in achieving the jointness amongst the three services. However, jointness across the military can only be achieved by the creation of a CDS, joint theatre command headquarters, and joint training schools.

Desired Modernization Goals

Desired Modernization Goal of the Indian Army

The desired goal of the modernization is to develop the Indian Army into a modern Army with a modern organization, technologically advanced weapons and equipment and well trained soldiers capable of fighting and winning all forms of warfare against all the enemies in a joint environment in order to achieve the National Military Objectives. This means that to develop the modern Indian Army capable to achieve the following.

1. Prevent war through strategic and conventional deterrence across the full spectrum of military conflict, to ensure the defense of India, its national Interests and sovereignty.[103]
2. Prosecute military operations to defend territorial integrity and ensure favorable end state during war to achieve stated/implied political objective(s).
3. Provide assistance to the government to ensure Internal Security in any part of the country, when called upon to do so.
4. Be prepared for contingencies at home and abroad to render humanitarian assistance and disaster relief (HADR), aid to civil authority and International peacekeeping, when called upon to do so.
5. Army equipped with modern weapons and equipment developed indigenously and less dependent on import.

[103] Headquarters Integrated Defense Staff, Ministry of Defence, *Joint Doctrine Indian Armed Forces,* 4.

It includes the capability to fight a two front war with China and Pakistan to maintain the territorial integrity of India. This implies the following.

1. The modern Indian Army with modern and state of art weapons an equipment capable of fighting a two front war.
2. A robust organization equipped with modern communication equipment capable of taking decisions in a complex environment.
3. A joint structure capable of conduction joint operations at all levels of warfare.
4. A strong indigenous defense industrial base capable of producing modern weapons and equipment to reduce dependence on imports.

Problems in Achieving the Desired Modernization Goals

Unplanned, Unsystematic and Ad-hoc Modernization Policy

The modernization of the Indian Army is unsystematic due to uncertainty from the government and the bureaucracy. The uncertainty of budget allocation, absence of a National level strategy or policy, and a lack of joint planning between the three services adds to the uncertainty. The defense expenditure and the budget is unplanned and it varies every year. With the absence of any National Security Strategy or National security objectives, it is difficult for defense planners to articulate the National military strategy and national military objectives. The MoD plans the modernization of defense forces by its three tier defense procurement planning processes: the 15-year Long Term Integrated Perspective Plan (LTIPP), the 5-year Services Capital Acquisition Plan (SCAP), and the Annual Acquisition Plan (AAP).[104] All these plans for modernization

[104] Amit Cowshish, "Distortions in the Discourse on Modernization of Armed Forces," *Journal of Defence Studies* 8, no. 3 (July-September 2014): 10, accessed March

are proposed by the Headquarters Integrated Defense Staff (IDS) to the MoD. However, these plans lack a vision, a budget, and cohesion amongst the three services. With no National Security Strategy this makes it even more difficult for the Armed forces to convince the Government of the urgent requirements for these modernization proposals. The planning for modernization is not ad-hoc or unsystematic from the Armed forces side, but it is unplanned and unsystematic from the government side.

Insufficient Defense Budget

India is a developing economy with high poverty and unemployment rate. The GDP is rising at 7% per year and the country is progressing consistently. However, the defense budget of India has consistently remained below 2% of GDP. The parliamentary committee on defense has recommended an additional $100 billion for modernization of Armed forces in next 10 years. But with a consistently declining percentage of GDP in defense budget, the full scale modernization of the Armed forces and the Indian Army seems very difficult. In the next few paragraphs I will analyze the defense budget of 2018-19 and how it is insufficient to achieve the modernization goals.

While presenting the Indian budget of 2018-19 in Parliament, Finance Minister Mr. Arun Jaitley allocated Rs 4,04,365 crore (US $62.8 billion) for the MoD.[105] Of the MoD's total allocations, Rs 2,79,305 crore ($43.4 billion) was earmarked for India's

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30, 2018, http://idsa.in/jds/8_3_2014_DistortionsintheDiscourseonModernizationofArmedForces.html.

[105] Laxman K. Behra, "Defence Budget 2018-19: The Imperative of Controlling Manpower Cost," Institute for Defence Studies and Analysis, February5, 2018, accessed March 30, 2018, https://idsa.in/issuebrief/defence-budget-2018-19-controlling-manpower-cost-lkbehera-020218.

defense budget, and the balance was distributed between MoD (Miscellaneous) (Rs 16,206 crore) and Defense Pensions (Rs 1,08,853 crore).[106] Like during the past several years, the defense budget for 2018-19 also grew marginally, with much of the growth being cornered by rising manpower cost.

The overall increase in the defense budget estimate for the year 2018-19 was 7.7 per cent. However, the growth declines to six per cent in comparison to the Revised Estimate (RE) of the previous financial year. This decline in growth is due to an increase in revenue expenditure, with the capital expenditure remaining exactly the same.

Table 1. Defense Budget Allocations for 2017-18 and 2018-19

Year	**Revenue Expenditure (Rs in Crore)**	**Capital Expenditure (Rs in Crore)**	**Total (Rs in Crore)**
2017-18 (BE)	172,774	86,488	259,262
2017-18 (RE)	176,516	86,488	263,004
2018-19 (BE)	185,323	93,982	279,305

Source: Laxman K. Behra, "Defence Budget 2018-19: The Imperative of Controlling Manpower Cost," Institute for Defence Studies and Analysis, February5, 2018, accessed March 30, 2018, https://idsa.in/issuebrief/defence-budget-2018-19-controlling-manpower-cost-lkbehera-020218.
Note: BE: Budget Estimate, RE: Revised Estimate. Rs 1.0 crore = Rs 10 million = US$ 155,278 (alternatively, US$ 1.0 million = Rs 6.4 crore) as per the average exchange rate for the first 10 months of 2017-18.

[106] Behra, "Defence Budget 2018-19: The Imperative of Controlling Manpower Cost."

Although the capital expenditure of the total defense budget of 2018-19 has increased, it has not been increased enough to correct the imbalance seen in the revenue-capital mix during the last several years. The present share of capital expenditure is still six percentage points lower than the ideal ratio of Revenue capital mix (to achieve an ideal ratio of 60:40). See figure 4 below.

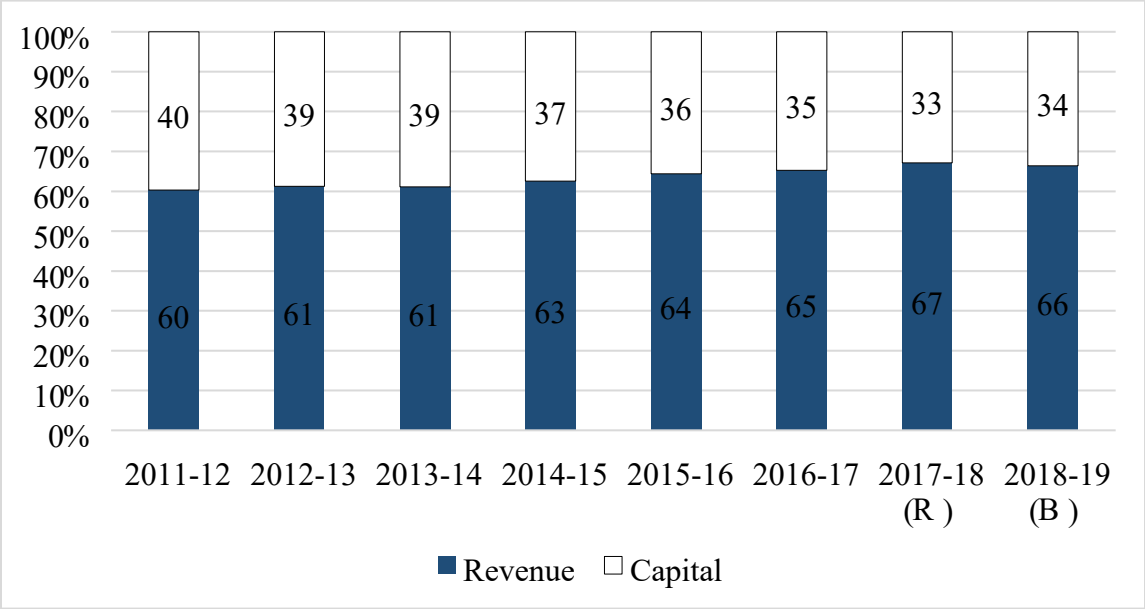

Figure 4. Revenue-Capital Ratio

Source: Laxman K. Behra, "Defence Budget 2018-19: The Imperative of Controlling Manpower Cost," Institute for Defence Studies and Analysis, February5, 2018, accessed March 30, 2018, https://idsa.in/issuebrief/defence-budget-2018-19-controlling-manpower-cost-lkbehera-020218.

Among the defense services, the Army has the largest share in the defense budget 2018-19 (55 percentages). However, the main reason for the Army's greater share is its size. The Indian Army accounts for 85 percent of the total manpower in the armed forces.

Therefore, the per capita budget of Indian Army is much less than the other two services. Figure 5 indicates the distribution of the defense budget.

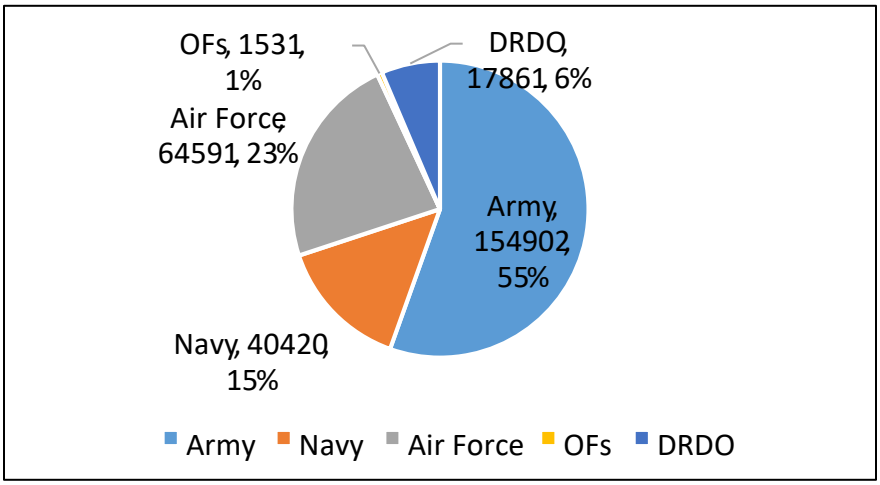

Figure 5. Share of Defense Services in Defense Budget 2018-19

Source: Laxman K. Behra, "Defence Budget 2018-19: The Imperative of Controlling Manpower Cost," Institute for Defence Studies and Analysis, February5, 2018, accessed March 30, 2018, https://idsa.in/issuebrief/defence-budget-2018-19-controlling-manpower-cost-lkbehera-020218.
NOTE: DRDO (Defense Research and Development Organization) and OFs (Ordinance factories)

The revenue-capital mix of all the defense services are summarized in Table 2. From the table, it is evident that the capital expenditure for the Indian Army is only 17 percentages as compared to more than 50 percentages for the Air force, Navy, ordinance factories (OFs) and the DRDO. As discussed earlier, the Indian Army has a lot of deficiency of the modern weapons and equipment, and with such a small capital budget, the modernization goals may not be achieved as is desired.

Table 2. Revenue and Capital Expenditure of Defense Services, 2018-19

	Army	**Navy**	**Air Force**	**OFs**	**DRDO**
Revenue Expenditure (Rs in Crore)	128,077	19,571	28,821	727	8,127
Capital Expenditure (Rs in Crore)	26,826	20,848	35,770	804	9,734
Revenue Expenditure (% of Total)	83	48	45	48	45
Capital Expenditure (% of Total)	17	52	55	52	55

Source: Laxman K. Behra, "Defence Budget 2018-19: The Imperative of Controlling Manpower Cost," Institute for Defence Studies and Analysis, February5, 2018, accessed March 30, 2018, https://idsa.in/issuebrief/defence-budget-2018-19-controlling-manpower-cost-lkbehera-020218.
NOTE: *Includes Rs 9.96 crore allocated for capital expenditure for the inspection organization.

Modernization Budget

Table 3 summarizes the overall modernization budget of the three forces; whereas Tables 4 provide the distribution of outlays and their growth for the Indian Army. The overall allocation for 2018-19 has grown marginally over the previous year. The modernization budget is so reduced that the Indian Army has to continue to maintain its obsolete weapons and equipment.

Table 3. Modernization Budget of the Armed Forces

Armed Forces	2017-18 (BE) (Rs in Crore)	2017-18 (RE) (Rs in Crore)	2018-19 (BE) (Rs in Crore)	% Increase in 2018-19 (BE) over 2017-18 (BE)
Army	20,148	20,177	21,211	**5.3**
Navy	18,749	18,338	19,927	**6.3**
Air Force	30,885	30,885	33,085	**7.1**
Total	**69,783**	**69,401**	**74,224**	**6.4**

Source: Laxman K. Behra, "Defence Budget 2018-19: The Imperative of Controlling Manpower Cost," Institute for Defence Studies and Analysis, February5, 2018, accessed March 30, 2018, https://idsa.in/issuebrief/defence-budget-2018-19-controlling-manpower-cost-lkbehera-020218.
NOTE: *: Figures for Army are approximate

Table 4. Modernization Budget of Army

Modernization Head	2017-18 (BE) (Rs in Crore)	2017-18 (RE) (Rs in Crore)	2018-19 (BE) (Rs in Crore)	% Increase in 2018-19 (BE) over 2017-18 (BE)
Aircrafts & Aero-engine	1,466	1,726	1,813	**24**
H&MV	3,194	1,849	1,972	**-38**
Other Equipment	15,112	16,286	17,198	**14**
Rolling Stock	265	105	128	**-52**
Rastriya Rifles	112	112	100	**-11**
Total	**20,148**	**20,177**	**21,211**	**5.3**

Source: Laxman K. Behra, "Defence Budget 2018-19: The Imperative of Controlling Manpower Cost," Institute for Defence Studies and Analysis, February5, 2018, accessed March 30, 2018, https://idsa.in/issuebrief/defence-budget-2018-19-controlling-manpower-cost-lkbehera-020218.

Lack of Indigenous Production of Modern Weapons and Equipment

As discussed earlier, for defense production, India has 39 ordnance factories, nine defense public sector undertakings (PSUs), and a small emerging private sector. In addition, there are 50 defense research and development laboratories under Defense Research and Development Organisation (DRDO) responsible for design & development of armaments for the armed forces.However, even with so many public sector organizations responsible for defense production, India still imports major defense weapons and equipment. These organizations have not been able to produce a satisfactory fighter aircraft[107], attack helicopters, transport aircrafts, robust Air defense system, modern artillery guns, armored fighting vehicle, etc. The amount of efforts and money spend on research and development is also not adequate for these organizations. Till 2001, with limited access to private companies, these PSUs enjoyed a monopoly. However, with the Indian government opening the defense sector to private companies in 2001, 'make in India' initiative launched in 2014, and allowing up to 100% FDI after government approval in 2016, the Indian government and the Indian defense forces are expecting improvements in the Indigenous defense production capabilities. Without indigenous production, it is very difficult for India and the Indian Army to achieve the desired modernization goals.

[107] Tejas is a single-seat, single-jet engine, multirolelight fighter aircraft, designed by the Aeronautical Development Agency (ADA) and Hindustan Aeronautics Limited (HAL) for the Indian Air Force and Navy. It took more than 25 years to develop this aircraft, and the Indian Air force is not satisfied with its performance.

Flawed Acquisition Policy

India is amongst the largest defense importers in the world.[108] However, even after this the major acquisition processes takes years to complete. The most important reasons for this is the bureaucratic red tape, and corruption. Induction of new and modern equipment takes, at best, between four to five years, and at worst, an endless wait due to the discovery of scams, kickbacks and the omnipresent agents to swing major deals.[109]

Absence of a National Security Strategy and a National Defense Strategy

India has no National Security Strategy and National Defense Strategy. Although India has fought one war with China and four with Pakistan, the government has failed to issue any national level strategy or documents on the basis of which the defense forces can plan their strategies. The only strategic document used for future plans is the Joint doctrine and the Indian Army doctrine. With no National Security Strategy, there is lack of vision amongst the political leadership as to how the future Indian Army should look. Similarly, with no National Defense Strategy, the defense budget is not based on the requirements to achieve it. The Indian Army plans its future requirements based on the Long Term Integrated Perspective Plan (LTIPP). However, this plan is never at the desired pace due to an absence of a National Security Strategy and National Defense Strategy. Although, the civil government controls the armed force in India, they have

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[108] Divya Rajgopal, "India world's largest importer of major arms in the last four years," *Economic Times*, 20 Feburary 2017, accessed March 31, 2018, https://economictimes.indiatimes.com/news/defence/india-worlds-largest-importer-of-major-arms-in-the-last-four-years/articleshow/57244332.cms.

[109] Vinay Sharma, "Defence Procurement: A Conundrum," *CLAWS* (Summer 2013): 128, accessed March 31, 2018, http://www.claws.in/images/journals_doc/1394685336Vinay%20Sharma%20CJ%20Summer%202013.pdf.

been reluctant in defining a strategy or carry out the dialogue required to define or determine a national level strategy. In 2001, the National Security Council (NSC) was established to define and make decisions on national level security matters. Unfortunately, the NSC has never issued any strategic level documents defining national security requirements.

Absence of a Robust Joint Command and Control Structure

The three services of the Indian Armed forces operate as three different entities. There is no CDS, no joint theatre Commands, and no joint decision making body. Although a group of ministers recommended the creation of an Integrated Defense Staff (IDS) to be headed by a CDS in 2001, the then Prime Minister Vajpayee accepted the establishment of the IDS but postponed the appointment of the CDS.[110] The IDS is headed by the Chief of Integrated Defense Staff to the Chiefs of Staff Committee (CISC) and reports to the Chairman, Chiefs of Staff Committee (COSC). Even in the IDS, turf battles and career prospect issues continue to undermine progress towards the institutionalization of jointness. The major opposition for a CDS comes from the civil services (bureaucracy) who have resolutely stalled every attempt of integration of the service headquarters within the MoD and the creation of a CDS.[111] They are stubborn and convinced that decision making should come only from the bureaucracy and maintain an

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[110] Vinod Patney, "Jointness in Armed Forces and Institution of Post of Chief of Defence Staff are Mutually Exclusive," *Institute of Defence Studies and Analysis* 2, no. 1 (Summer 2008): 31, accessed March 31, 2018, https://idsa.in/system/files/jds_2_1_vpatney.pdf.

[111] Sheryl Sahni, "Achieving 'Jointness' Among Indian Armed Forces," Observer Research Foundation, 12 June 2017, accessed March 31, 2018, http://www.orfonline.org/research/achieving-jointness-among-indian-armed-forces/.

opinion that service headquarters should be retained as "attached offices" to the MoD. Also the Indian Air force has been opposing the integration because it feels threatened due to its small size and may lose its authority to influence the decision making. At present, India has a total of 19 commands: seven army commands (of which six are theatre); seven air force commands (of which five are theatre); three naval commands (of which two are theatre), and two joint commands.[112] None of these are co-located and their geographical responsibilities have little commonality. In most cases, the command of one service overlaps or is linked with two or more commands of the other services.

Approaches to Achieve Modernization Goals

In order to achieve security and stability in the region, the Indian government and the senior leadership of the Indian Armed forces must take more steps towards modernization. The modernization must be well planned, holistic, and must cover all aspects of modern armed forces. The modernization must involve strategic planning and directions from the government, joint planning and decision making, allocation of budget, and the induction of modern weapons and equipment. The author will cover all these aspects under two headings, the organizational level modernization involving structural modernization and the modernization of weapons and equipment. After analyzing anumber of options and the approaches, the author developed four best approaches (options) to achieve the modernization goals as stated before. These approaches are:

[112] Brigadier Ranjit Singh, "Unified Commands in The Indian Armed Forces: Imperative for Integrated War Fighting," Centre for Joint Warfare Studies (CENJOWS), 2016, 9-10, accessed April 1, 2018, https://cenjows.gov.in/pdf/Layout_Unified%20Comd%20by%20Brig%20Ranji_03-04-17.pdf.

1. Rapid organizational modernization and moderate modernization of weapons and equipment.
2. Moderate organizational modernization and rapid modernization of weapons and equipment.
3. Rapid organizational and weapons and equipment modernization.
4. Moderate organizational and weapons and equipment modernization.

Option I: Rapid Organizational Modernization and Moderate Modernization of Weapons and Equipment

The first recommended approach for the Indian government to modernize Indian Army is rapid organizational modernization and a moderate modernization of weapons and equipment based on budget availability and threat analysis. This approach requires a combined effort from all three services, ministry of defense, the bureaucracy, and the Indian government. The organizational modernization should focus on:

1. Establishment of a joint decision making organization to include appointment of a CDS and formation of joint theatre commands. Establishment of joint logistics and other services organizations.
2. Establishment of two new joint organizations, joint Special Forces command and joint cyber and space command.
3. Reduction in personnel strength of the Indian Army and civilian organizations to reduce revenue expenditure.
4. Formulation and Issue of a National Security Strategy and National Defense Strategy by the Prime minister and the NSC.

5. Reorganization of Army aviation to include all rotary wing helicopters within the Indian Army and the Indian Air force responsible for all fixed wing aircrafts.
6. Develop Self-reliance on defense production.

The formation of joint 'theatre commands' and the appointment of a CDS should be the first step to achieve modern organization and jointness amongst the armed forces. In modern conflicts, joint operations are very important for synergy and the optimum utilization of all available resources. For complete joint operations, the first step is the joint decision making and command and control structure. Therefore, the appointment of a CDS and the establishment of Joint theatre commands is the first step in creating a modern organization. These actions at the top level will also enforce jointness at the tactical level of war. The appointment of a CDS will provide joint advice to the Cabinet Committee on Security (CCS) and the Prime Minister and will remove inexperienced advice from the bureaucracy.

Similarly, another important aspect in the formation of modern army is the establishment of joint logistics and other services organizations. The first step in this regard would be to integrate and where possible outsource logistics functions of the Armed forces. Integrated logistics will reduce efforts by all three services especially in areas where all three are deployed together. It will also increase jointness amongst the armed forces. The outsourcing of basic logistics requirements will reduce the size of logistics corps in the Indian Army and enhance its 'teeth-to-tail' ratio. With the improvement of infrastructure all across the country, there is also an important requirement to restructure the logistics echelons. The present supply and ordinance echelons are based on 1960s/1970s requirements when the road and railways connectivity

in the country were not good. But now this system is adding unnecessary staging areas and increasing manpower requirements.

Another step towards modern organization would be the establishment of two new specialized joint organizations; Special Forces Command and Cyber and Space Command. At present India has two joint commands; Andaman and Nicobar Command (ANC) and Strategic Forces Command (SFC). All three services maintain special forces, which are operationally and administratively under the respective services. A joint command would create a single agency to control and synergize the employment of these vital assets in furtherance of our military objectives. Similarly, all the services are trying to build cyber capabilities along with India achieving many mile-stones in space capabilities. A joint cyber and space command would enable the Indian armed forces to synergize and synchronize all its available resources.

India has the world's third largest standing Army which results in an increase in revenue expenditure on personnel. To build up the capability to deal with potential threats and challenges, the Indian Army has continued to expand, in terms of manpower. This problem was compounded by some faulty human resources (HR) policies in recent years, that incentivized the holding of more manpower by linking it to the calculation of senior rank positions in the Army.[113] Reduction in the Army's size is another important aspect to modernize as it will not only reduce the number of personal, but also reduce veterans numbers in the future. The 'manpower problem' has been exacerbated with the expanding size of civilians under the MoD. All this has adversely affected the Army's efforts at optimization and modernization in an era of overwhelming budgetary

[113] Compose, "Modernisation of Indian Army: Future Challenges," 1-2.

constraints. The Indian Army needs to undergo transformation to become an optimized modern force, with a more efficient 'teeth to tail' ratio. Whereas it provides 'comfort', from the military commanders' point of view, to have an independent capability for each front, it would make more pragmatic and economic sense to have only a minimum essential capability on either front, while maintaining a suitably large 'dual-front capable' central reserve, possibly under the aegis of a Strategic Reserve Command, to reinforce the front where the actual threat develops.[114] However, given the large scale operational commitments for border management and counter terrorist operations and non-availability of state-of-art weapons and equipment, it is difficult for the Indian Army to reduce its manpower numbers. Similarly, Indian armed forces logistics need to be integrated and optimized based on priority. The new structures for expanding Army aviation, enhancing information warfare capabilities, and raising of proposed special operations, cyber, and space commands must be provided manpower from within the existing manpower. The Indian Army is also required to restructure its units to reduce the heavy manpower requirements. On 30 August 2017, the Cabinet Committee on Security (CCS) had approved implementation of the first phase of 99 reforms recommended by the Shekatkar Committee (65 out of 99). These reforms involve redeployment and restructuring of approximately 57,000 posts of officers, soldiers and civilians in the Indian Army.[115] Along with restructuring, there is an urgent requirement to reduce manpower strength by induction of new and heavy caliber artillery, air, missiles, and

[114] Compose, "Modernisation of Indian Army: Future Challenges," 1-2.

[115] Raghuvanshi, "India May Downsize Army to Pay for Weapons."

other lethal weapon system. The system of surveillance also needs a drastic change by using new and modern satellite based surveillance equipment.

Another point in modernization is that the government must provide guidance to the military through the issuance of aNational Security Strategy and National Defense Strategy. This will enable the Indian Army to align its policies and doctrines in relation to these strategies and in coordination with the other services. These strategies could also provide guidance to the Armed forces for the establishment of maximum and minimum strength requirements. The defense budget will be based on the requirements established in these documents. It will become easy for the strategic leaders of the Indian Army to prioritize the procurement of weapons and equipment.

One of the biggest organizational changes within the Army that needs to be implemented should be reorganization of Army aviation. The responsibility of all rotary wing helicopters should be given to the Army and the Air force should retain the responsiblity for fixed wing aircrafts (similar to the USA). At present, Army aviation holds light observation and light utility helicopters. The Indian Air force holds the light, medium, and few heavy utility helicopters and the attack helicopters. In 2012, the Indian Air force ordered 22 Apache AH-64D attack helicopters for $1.3 billion.[116] The Indian Army also requested for 39 Apache AH-64D attack helicopters for its inventory. In 2017, the MoD sanctioned the procurement of six Apache AH-64D attack helicopters for the Indian Army.[117] This has caused much discontent amongst the Indian army and the

[116] Raghuvanshi, “India approves deals for Apache helicopters, maritime engines.”

[117] Ibid.

Indian Air force. The Army does not trust that enhancing the attack helicopter capability of Indian Air force will help its forces as these assets are required at the tactical level of war whereas joint planning involving Indian Air force takes place at operational level. Similarly, Indian Air force does not want to lose helicopters from its inventory.

Many defense experts feel that India's self-reliance in defense production may reduce the procurement costs of modern weapons and equipment. India's heavy dependence on imports has been a matter of concern for the parliamentarians, oversight agencies, policy makers, and the defense services. The two flagship projects of the main battle tank "Arjun" and the Light combat aircraft "Tejas" are examples of DRDO's production delays and cost overruns. These projects have raised questions about the Indian defense industry's capability to produce weapon system and defense technology to meet the requirements of the services. The new government policies of increasing the FDI to 100% through government approval and 49% under automatic route and 'make in India' defense, are positive steps towards achieving self-reliance in defense production.[118] There are requirements needed to reduce the bureaucratic hurdles in order to attract foreign and domestic private sector companies to invest and produce weapons and equipment in India. By providing a level playing field to the private industries and establishing accountability amongst defense PSUs, India will be able to achieve self-reliance in defense production.

The organizational modernization should be completed within 9-12 years in three phases. The recommended priority and phase implementation is:

[118] Nampi Ranjan, "FDI in Defence Sector," Press Information Bureau, Government of India, Ministry of Defence, 31 March 2017, accessed March 31, 2018. http://pib.nic.in/newsite/printrelease.aspx?relid=160287.

1. Phase I: The first phase should include the appointment of a CDS and raising joint functional commands. The existing joint functional commands; Andaman and Nicobar command (ANC) and the strategic forces command (SFC) should be made more joint. In addition, cyber and space command, special forces command, and joint logistics command should be established. These should be completed within the time period of 3-5 years.
2. Phase II: The second phase should constitute the creation of joint theatre Commands. The Army, Air force, and Navy theatre commands must be reorganized and restructured into six joint theatre commands. The proposed joint theatre commands are the Northern theatre command, the western theatre command, the eastern theatre command, the central theatre command, the Indian ocean region (IOR) (west), and IOR (east) commands.[119] The total time period for this phase should be 6-8 years. This phase should be further sub divided into two sub phases.

    A Phase II(a): Creation of Northern, western, and central theatre commands.

    B Phase II(b): Creation of Eastern, IOR (west), and IOR (east) theatrecommands. The time line for both phases should be three to four years each.

The Northern Theatre Command should comprise the existing Northern Command and requisite elements of the Western Air Command, primarily to look after the state of J&K including counter terrorism operations. The Western Theatre Command should comprise the existing Western Command, South Western and Southern

[119] Singh, "Unified Commands in The Indian Armed Forces: Imperative for Integrated War Fighting," 10-15.

Commands of the Indian Army, Western and South Western Air Commands of the Indian Air force, primarily oriented towards Indian borders with Pakistan except the state of Jammu and Kashmir. A requisite naval complement also needs to be allocated to this theatre. The Eastern Theatre Command should comprise the Eastern Command of the Indian Army and the Eastern Air Command of the Indian Air force predominantly aligned to counter Chinese threat and counter terrorist operations in north eastern states of India. The Central Theatre Command would comprise the Central Command of Indian Army and the Central Air Command of the Indian Air force. Its primary responsibility would encompass borders with China in Himachal Pradesh and Uttarakhand, and with Nepal in Uttar Pradesh. The Indian Ocean Region (IOR) theatre Command should encompass two separate theatres; IOR (West) and IOR (East) based on the Indian coastline. They should be organized to include elements of the Southern Command of the Indian Army, Southern Air Command, Western Naval Command, Eastern Naval Command and the Andaman and Nicobar Command (ANC), aligned to undertake operations in the IOR and cater for maritime threats. The IOR (west) should be oriented towards western coast of India and the IOR (East) towards the eastern coast.

Overall, there would be a major reduction in the staff, since 19 commands would be restructured into six theatre commands and five functional commands (after ANC is included in IOR (East) command). The staff authorized to the component commanders will be much less due to availability of staff at the theatre level. This would result in significant equipment and manpower savings, apart from better planning, coordination and conduct of operations. The reduction in numbers of senior officers may be a cause of concern but the three services would be required to work out a solution. At the national

level, the production of a National Security Strategy and a National Defense Strategy should be required every 5-years.

While the rapid organizational reforms are undertaken, the Indian Army should keep up the modernization of weapons and equipment concurrently but at moderate speed depending on budget availability. The Indian Army should prioritize the 'most critical' requirements over the next three years depending on the present budget allocations. Similarly, for every subsequent three years, the Indian Army should develop a plan and modernize the forces based on it. It can also rely on a few government initiatives like 'make in India' and FDI in defense to reap good dividends in the future. For this, the Indian Army should prioritize both its threats and its most important capabilities required to counter them. Modernization of weapons and equipment must not only involve the replacement of vintage weapons and equipment, but also the upgrade of selected quantities of old serviceable equipment in a phased manner.[120] While carrying out the priority, the present threat assessment and overall support from different services should be considered. Therefore, considering conventional threats from Pakistan and China, the first priority should be accorded to the acquisition of medium artillery, the attack helicopters, and the technological upgrading of T-72 tanks and BMP-II. Similarly, to deal with terrorism, the first priority should be given to new surveillance equipment like aerostat, advance battle field surveillance radars (BFSR), night sights and night surveillance equipment for Infantry, new assault rifles and body armor initially for the troops deployed in counter terrorist operations. Research and development can be increased towards the development of an indigenous helicopter, battle field management

[120] Compose, "Modernisation of Indian Army: Future Challenges," 1-2.

system (BMS), and C4ISTAR (Command, Control, Communications, Computers, Information/Intelligence, Surveillance, Targeting Acquisition and Reconnaissance) systems. The newly developed missiles by DRDO can also be inducted, which can act as deterrence for the conventional threats. These first priority modernization programs must have a timeline and then the second priority programs should be implemented. The second priority should be given to the acquisition ofnew tanks, new anti-tank guided missiles (ATGMs), advanced air defense systems, new assault rifles, new light machine guns, and advance surveillance equipment including drones, UAVs etc. These procurements should also be set based on a timeline. The total time for the moderate weapons and equipment should not be more than 17-23 years. The recommendation is as follows:

1. Phase I: This phase should focus on the urgent requirements of critical weapons and equipment. These include a new assault rifle for the infantry soldiers deployed in field areas, procurement of new artillery guns, new air defense weapons, new attack helicopters and upgrading the T-72 tanks. The time frame should be between 5-7 years.
2. Phase II(a): This phase should include new and light weight mortars, light machine guns, and rocket launchers for infantry, mobile guns and advance multi barrel rocket launchers (MBRL) for the artillery battalions, induction of UAVs and drones, expansion of army aviation and the induction of an advance attack helicopters fleet, and replacement of T-72 tanks. It should also involve all the technical up gradation required to make the Indian Army capable of fighting

network centric warfare and space warfare. The time frame should be 6-8 years after phase I.

3. Phase II (b): The weapons and equipment should include new and advanced night sights for every soldier, new carbine rifles, new radio sets and better back packs for the infantry, advance C4ISR systems and advance weapon location radars for artillery, induction of future and advance infantry combat vehicles for the mechanized infantry. The time frame should be 6-8 years after phase II (a).

Option II: Moderate Organizational Modernization and Rapid Modernization of Weapons and Equipment

The second option is to carry out the organizational modernization at a moderate speed, while placing the emphasis on the modernization of weapons and equipment at a rapid pace. The focus of organizational modernization will remain in the same six categories as discussed in the option I. However, the prioritization is different and the time period of implementation will change.

To achieve the rapid modernization of weapons and equipment, the government of India has to take a lot of bold initiatives. Firstly, there will be an urgent requirement to increase the defense budget to 2.5% of GDP and then to 3% of GDP, until the complete modernization of the Indian Army is completed. As discussed earlier, the Parliamentary committee on defense has recommended a requirement to increase the defense budget to 3% of GDP in order to modernize the armed forces in the next 10 years. However, just an increase in the defense budget is not sufficient to achieve the modernization goals of the Indian Army. The government needs to change procurement policies and reduce bureaucratic hurdles. Over the past two years the Indian Army could not spend its allotted

capital budget. This was due to the scrapping of several proposed acquisitions, delays in preparing and finalizing the projects, cost overruns, reported corruption in procurements, and the inability of the indigenous defense industries to produce the promised weapons and equipment on time or within required standards.

The second aspect of modernizing weapons and equipment without requiring a substantial increase in the defense budget is by establishing a domestic industrial base capable of producing high technological weapons and equipment in India. The 'make in India' in defense and 100% FDI in defense after government approval programs are good steps. However, the government needs to take more bold steps and actions to enhance defense production. To incentivize defense & aerospace sectors under 'make in India', Finance Minister Mr. Jaitley had announced two key decisions: an industry friendly defense production policy 2018, and two defense industrial production corridors.[121] In addition, the announcement extending the reduced corporate tax of 25 per cent to all companies with a turnover of up to Rs 250 crore (approximately 38 million dollars) is likely to benefit a large number of micro, small, medium enterprises (MSMEs) in the private sector that are engaged in defense production. While the above mentioned steps are in the right direction and, if implemented well, will benefit India's self-reliance efforts, what is bothersome is the paltry sum of Rs 142 crore (approximately 21.8 million dollars) provided under the 'Make in India' head of the defense budget, which is intended

[121] Behra, "Defence Budget 2018-19: The Imperative of Controlling Manpower Cost."

to provide financial assistance to Indian industries that undertake design and development, leading to indigenous production.[122]

Finally, the Indian Army need to convince the government and the parliament that the increased budget requirement is important to achieve the rapid modernization of weapons and equipment. This is difficult because India is a developing country with high poverty and unemployment as compared to the developed world. Due to these problems, successive governments have allocated more budget towards social welfare programsthen defense. With the economic condition of its population still below satisfactory level, it is very difficult to convince the government to allocate 2.5-3% of GDP towards the defense budget. The recommendation for implementing the rapid weapons and equipment modernization is as follows:

1. Phase I: This phase should focus on the urgent requirements of critical weapons and equipment. These include new assault rifle for the infantry soldiers deployed in field areas, procurement of new artillery guns, new air defense weapons, new attack helicopters and upgrading of T-72 tanks. The time for this phase should not exceed 3-5 years.
2. Phase II(a): This phase should include new and light weight mortars, light machine guns, and rocket launchers for infantry, mobile guns and advance multi barrel rocket launchers (MBRL) for artillery battalions, induction of UAVs and drones, expansion of army aviation and induction of an advance attack helicopters fleet, and replacement of the T-72 tanks. It should also involve all the technical

[122] Behra, "Defence Budget 2018-19: The Imperative of Controlling Manpower Cost.".

capabilities required to make the Indian Army capable of fighting network centric warfare and space warfare. The time for this phase should not exceed 3-4 years after completion of phase I.

3. Phase II (b): The weapons and equipment should include new and advanced night sights for every soldier, new carbine rifles, new radio sets and better back packs for infantry, advance C4ISR systems and advance weapon location radars for artillery, induction of future and advance infantry combat vehicles for mechanized infantry. The time should not exceed 3-4 years after phase II (a).

The organizational modernization requires initiatives not only from the senior leadership of the armed forces, but also from the government and the bureaucracy. As we have discussed there are some resistance from the bureaucrats and the services, as they fear losing control. The Kargil Review Committee (KRC) and the Group of Ministers (GoM) reports highlighted several deficiencies in India's security management system and recommended certain measures to be undertaken.[123] Of all the recommendations made by the GoM report, the three most important were; integration of the services with one another as well as with the MoD; the creation of a CDS; and joint operational commands. Whilst, the speedy transformation of the Armed Forces was well understood and acknowledged, however, the implementation was restricted to creation of ANC and establishment of SFC. Other major issues remain unaddressed, adversely impacting integration of the Armed Forces. It is expected that there will be a lot of resistance to the

[123] Kargil review committee: This was a committee set up by the government of India after India's Kargil war with Pakistan in 1999. The committee was tasked to identify the lapses in defense forces and give its recommendations to modernize Indian armed forces.

creation of a CDS and the joint theatre commands. The government can carry out the process of organizational restructuring at moderate speed, while focusing towards modernization of weapons and equipment required to fight all spectrum of warfare. The phased implementation of organizational modernization should be the same as discussed in option I, however the time frame required may vary. The recommended time frame for the organizational modernization is as follows.

1. Phase I:5-7 years.
2. Phase II (a):6-8 Years after completion of phase I.
3. Phase II (b):6-8 Years after completion of phase II(a).

Option III: Rapid Organizational and Weapons and Equipment Modernization

The third option is rapid organizational as well as weapons and equipment modernization. This option is the most difficult option. As discussed earlier, the requirements for this option constitute all the organizational modernization and weapons and equipment modernization discussed in option I. However, the time frame of organizational modernization is as discussed in option I while the time frame for the weapons and equipment modernization is as discussed in option II. This option will have the maximum difficulties and opposition.

This option will require the maximum coordination and synchronization amongst the armed forces. There is also a requirement to synchronize the organizational modernization with the modernization of weapons and equipment. For example, phase I of organizational modernization discussed in option I. The phase I of organizational modernization focuses to establish a CDS and joint functional commands within a time

period of 3-5 years. The modernization of weapons and equipment of phase I should also be suitably undertaken in a coordinated manner. While the Indian Army should fulfill the critical weapons and equipment deficiencies as a first priority, the capability building of the joint forces command should also be carried out along with their establishment. Similarly, the phase II (a) and II (b) of organizational reforms should coincide with the weapons and equipment modernization. The modernization of each joint theatre command can take place at a time as per its establishment. Although, this looks as the best way, it has the most problems.

Firstly, it will have a lot of opposition from the bureaucrats and the forces. While the bureaucrats and the smaller services (Air force and Navy) will oppose joint theatre commands and a CDS, the increasing budget requirements will become the major issue for the opposition from political class. Therefore, the government will have to take a tough stand for both oppositions of bureaucrats and services as well as the political class who are against the increase in defense budget. Secondly, it will involve a lot of efforts from the government to enhance the defense production by providing conducive environment to the national and international weapons manufacturer. Finally, and the most important aspect will be stability of government for 10-15 years. India being a multi-party democracy, it is always very difficult for a government to survive for 10-15 years without support from other key regional parties. Making tough decisions may cause loss of popularity for the government. Opposition parties may try to counter the government on the increased budget issue and may terminate the plans if they come to power. The recommendation for this option is:

1. Phase I: The first phase should include the appointment of a CDS and developing joint functional commands. This should be followed by the urgent requirements of critical weapons and equipment. These include new assault rifle for the infantry soldiers deployed in field areas, procurement of new artillery guns, new air defense weapons, new attack helicopters and upgrading the T-72 tanks. The time for this phase should not exceed 3-5 years.
2. Phase II (a): The organizational modernization should focus on creation of Northern, western and central theatre commands. The weapons and equipment modernization should include new and light weight mortars, light machine guns, and rocket launchers for infantry, mobile guns and advance multi barrel rocket launchers (MBRL) for artillery battalions, induction of UAVs and drones, expansion of army aviation and induction of advance attack helicopters fleet, and replacement of T-72 tanks. It should also involve all the technical capabilities to enable the Indian Army to fight network centric warfare and space warfare. Amongst all these weapons and equipment modernization, the priority can be given to the phase II(a) formations. The time for this phase should not exceed 3-4 years after completion of phase I.
3. Phase II (b): Creation of Eastern, IOR (west), and IOR (east) theatre commands. The weapons and equipment should include new and advanced night sights for every soldier, new carbine rifles, new radio sets and better back packs for infantry, advance C4ISR systems and advance weapon location radars for artillery, induction of future and advance infantry combat vehicles for mechanized infantry. The time should not exceed 3-4 years after phase II (a).

Option IV: Moderate Organizational and Weapons and Equipment Modernization

The fourth option is to implement moderate organizational and weapons and equipment modernization. As discussed earlier, the requirements for this option also constitutes all the organizational modernization and weapons and equipment modernization discussed in option I. However, the time frame of organizational modernization is as discussed in option II while the time frame for the weapons and equipment modernization is as discussed in option I. This is the present state of modernization of the Indian Army. The Kargil review committee has given its recommendations in 2002. After that the NSC was established and a NSA was appointed. Two joint commands ANC and SFC are established and headquarter IDS was also established. However, no CDS and joint theatre commands have been established. The NSC has not issued any strategic guidance and the involvements of the defense forces in policy matters have not been done. The procurement policy was revised many times but no fast-track procurement has been achieved. The Indian Army numbers grew and the budget percentage of GDP has reduced. The opposition for the joint theatre command was so great that there is no time line established by the government to achieve it. All the services still have their own logistic establishment and are in the process of creating their own cyber capabilities.

As we have discussed earlier, the modernization of weapons and equipment for the Indian Army has been very slow due to various reasons. No new guns have been inducted in the Artillery corps for almost 30 years, the air defense systems are nearly absolute, and the infantry assault rifles are nearing vintage. The armed forces have no advance surveillance systems and the battle field management system and advance

command and control systems are still in the planning phase. By following the similar speed of modernization of weapons and equipment, India will be assuming a greatest risk for national security. With no possibility ofan increase in defense budget in terms of percentage of GDP, the Indian Army is required to focus on a planned modernization to fight both conventional two-front war and the anti-terrorist operations. Even with less in capital budget, the Indian Army has not been able to spend its full allotted. This was mainly due to the scrapping of projects or delays in procurement by the MoD. This problem is compounded by procurement policies and bureaucratic hurdles. Therefore, in order to achieve a moderate modernization of weapons and equipment, the problems discussed needs to be overcome. A robust procurement policy and involvement of the defense forces will reduce the problems. Also the government should reduce the time frame of procurement policy and critical deficiencies should be met. The suggested approach is:

1. Phase I: The first phase should include the appointment of a CDS and developing joint functional commands. This should be followed by the urgent requirements for critical weapons and equipment. These include new assault rifle for the infantry soldiers deployed in field areas, procurement of new artillery guns, new air defense weapons, new attack helicopters and upgrading T-72 tanks. The time for this phase should not exceed 5-7 years.
2. Phase II (a): The organizational modernization should focus on creation of Northern, western, and central theatre commands. The weapons and equipment modernization should include new and light weight mortars, light machine guns, and rocket launchers for infantry, mobile guns and advance multi barrel rocket

launchers (MBRL) for artillery battalions, induction of UAVs and drones, expansion of army aviation and induction of an advance attack helicopters fleet, and the replacement of T-72 tanks. It should also involve all the technical capabilities to enable the Indian Army to network centric warfare and space warfare. Amongst all these weapons and equipment modernization, the priority can be given to the phase II(a) formations. The time for this phase should not exceed 6-8 years after completion of phase I.

3. Phase II (b): Creation of Eastern, IOR (west), and IOR (east) theatre commands. The weapons and equipment should include new and advanced night sights for every soldier, new carbine rifles, new radio sets and better back packs for infantry, advance C4ISR systems and advance weapon location radars for artillery, induction of future and advance infantry combat vehicles for mechanized infantry. The time should not exceed 6-8 years after phase II (a).

Table 5. Summary of Modernization Approaches

Approach	Time frame			Suggested Share of GDP (%)	Advantages	Disadvantages
	Phases	OM (years)	W & E M (years)			
Rapid OM and Moderate W & E M	I	3-5	5-7	1.6-1.8 (status Quo)	- No increase in Defense budget - Increase in capital budget due to reduced numbers of personal - Increased efficiency due to jointness	- Already obsolete weapons and equipment - May reduce deterrence
	II a	3-4	6-8			
	II b	3-4	6-8			
Total (years)		**9-13**	**17-23**			
Moderate OM and Rapid W & E M	I	5-7	3-5	2.5-3	- Modern W & E increase Indian Army lethality - deterrence against two front war	- lack of jointness even after modern W & E. - May effect economic development of the country
	II a	6-8	3-4			
	II b	6-8	3-4			
Total (years)		**17-23**	**9-13**			
Rapid OM and Rapid W & E M	I	3-5	3-5	2.5-3	- Modern W & E increase Indian Army lethality - deterrence against two front war - Increased efficiency due to jointness	May effect economic development of the country
	II a	3-4	3-4			
	II b	3-4	3-4			
Total (years)		**9-13**	**9-13**			
Moderate OM and W & E M	I	5-7	5-7	1.6-1.8 (Status Quo)	-No increase in Defense budget	- Already obsolete weapons and equipment - May reduce deterrence - lack of jointness
	II a	6-8	6-8			
	II b	6-8	6-8			
Total (years)		**17-23**	**17-23**			

Source: Created by author.
NOTE:
OM: Organizational modernization
W & E M: Weapons and equipment modernization

Feasibility, Acceptability and Suitability (FAS) Analysis

After recommending the four best possible approaches, the author will validate these approaches against the screening criteria given by Richard Yarger–Feasibility, Acceptability, and Suitability (FAS). As discussed in chapter 3, Feasibility is an assessment of the strategic concept (ways) given the resources available (means). Acceptability is determined by comparing the resources required (means) and the benefits to be achieved (ends). A military objective is suitable if, when achieved, it leads to a desired political or national security objective.

1. Option I: This option is highly feasible as it does not require additional resources. The means available are sufficient to carry out this option. The most important factor is the will power of the government to implement it. The acceptability of this option is also high. The benefits of joint operations can be seen in US Army operations. Therefore, this option may not give a technological edge to the Indian Army, it will enable better utilization of resources and cohesion amongst the armed forces. The suitability of this approach is medium because it does not achieve the modernization goals of the Indian Army in next ten years' time frame. However, depending on the growth of Indian economy and the success of 'make in India' program, the suitability can be increased to high.
2. Option II: This option is low in feasibility. This options relies on defense budget of approximately 2.5-3.0 % of the GDP. With poverty, unemployment, and illiteracy as the major issues for the government, an increase in the defense budget is less likely. However, the success of 'make in India' can increase the feasibility to moderate. The acceptability of this option is also medium. Although, the

benefits of spending money on modern weapons and equipment without the modern organization may not yield the desired results and it may also lead to duplication of efforts. The suitability of this approach is medium. Only modern weapons and equipment at high cost to the economy of a developing nation without joint organization may not achieve the desired political or military objectives.

3. Option III: This option is low in feasibility. This option also relies on defense budget of approximately 2.5-3.0 % of the GDP. With poverty, unemployment, and illiteracy as the major issues for the government, an increase in the defense budget is less likely. Therefore, the resources (means) to implement this option may not be available. However, the success of 'make in India' and the DPP-2016 can increase the feasibility to moderate. The acceptability of this option is high. Although the resources (means) required for this option are more, the benefits achieved (ends) are also maximum. By adopting this option, the Indian Army will achieve its modernization goals within 9-13 years' time period. The suitability of this approach is medium. This option will lead to the desired military objectives, but the diversion of resources from the development of country towards modernization of the armed forces may not achieve the national political objectives.
4. Option IV: This option is high in feasibility. This option neither requires a increase in resources (means) nor requires a tough stand from the political leadership. This is a status quo. The risk in this option is very high. The acceptability of this option is low. The benefits achieved (ends) in this option are

minimum and the risk of losing the territorial fight with the modern Chinese PLA forces are very high. Similarly, the suitability of this approach is also low. This approach neither helps to achieve the political or the national security objectives.

Table 6. FAS Analysis

Options	**FAS Test**			**Recommended priority by author**
	Feasible	Acceptable	Suitable	
Rapid OM and moderate W & E M	High	High	Medium	**I**
Moderate OM and Rapid W & E M	Low	Medium	Medium	**III**
Rapid OM and Rapid W & E M	Low	High	Medium	**II**
Moderate OM and W & E M	High	Low	Low	**IV**

Source: Created by author.
NOTE:
OM: Organizational modernization
W & E M: Weapons and equipment modernization

Conclusion

India's security environment requires it to prepare its forces to deal with a two-front war with China and Pakistan at the same time carry out anti-terrorist operations. To achieve this, India should develop a modern Indian Army capable of dealing with any type of threat jointly with the other services. This requires more emphasis from the

government of India to achieve organizational as well as weapons and equipment modernization. This can be achieved by using a timeline and modernize based on those timelines.

CHAPTER 5

CONCLUSION AND RECOMMENDATIONS

The preceding chapters presented an analysis of the current state and desired end state of modernization of the Indian Army, analyzed the problems to achieve the desired end state, and propose the various approaches for India to achieve the desired end state. It also analyses the present security environment of India. This chapter will draw the conclusion based on the preceding chapters and will recommend a suitable approach for the government of India and the Indian Army.

Summary of the Security Situation in India

India is facing both conventional and non-conventional (training, arming, and financing terrorists) threats from Pakistan. India is also facing a conventional threat from China mainly due to unresolved territorial disputes along its borders. Maoist insurgency, the rise of global terrorism, and Islamic State of Iraq and Syria (ISIS) are also security threats to India and are being neutralized by state police forces and para military forces. The conventional threat from the rapidly modernizing China's PLA is considered more potent. There is also a possibility of a 'two front' war involving both China and Pakistan. Chinese building CPEC and Pakistan leasing the Gwadar port to China indicates a possibility of collusion between Pakistan and China. Presently most of the Indian Army is deployed for counter terrorist operations and border management along the line of control in Jammu and Kashmir; and counter terrorist operations in India's north-eastern states.

Recommended Approach for Modernization

In order to deal effectively with both conventional and non-conventional threats, India needs to modernize its Army. The modernization should not only be linked to modern weapons and equipment, it should also involve organizational and policy reforms. The Indian Army modernization is only possible if the key issues like formulation of a National Security Strategy and a National Defense Strategy; appointment of a CDS, establishment of joint theatre commands; creation of joint logistic and special forces, cyber, and space commands; increase military representation in strategic decision making; increase indigenous production of modern weapons and equipment; involvement of private and international players in defense production; bureaucratic hurdles are overcome. Similarly, success of 'make in India' policy is very important to achieve the weapons and equipment modernization without increasing the defense budget. The Indian government and army top leadership need to take specific measures, as highlighted in the previous chapter, in order to overcome the problems in the path of modernization.

Amongst the four recommended approaches, the approach involving rapid organizational modernization and moderate modernization of weapons and equipment is the most suitable. There are numerous advantages of this approach. Firstly, this approach focuses on faster organizational modernization. This approach does not require a big budget, however it will enhance the economy of effort, increase interoperability amongst the services, reduce the problems of decision making and may reduce the strength of the armed forces. The reduced strength will reduce the revenue budget thereby increasing the capital budget. Secondly, it gives time for the government to develop a suitable

indigenous production capability and evolve a better procurement policy. This approach gives time to the new 'make in India' policy and the role of private players serves as a warning for the defense public sector undertaking to improve their performance. If the DPP-2016 and 'make in India' succeed, the indigenous production will reduce India's dependence on imports, reduce the price of weapons and equipment, and increase India's arms export to other countries. Thirdly, it does not force the government to increase the defense budget drastically. It makes the government focus on modernization in a planned manner, reduces duplication of efforts like the procurement of Apache helicopters by both Indian Army and Air force, and helps the CDS to prioritize procurements instead of infighting between the three services to gain a maximum budget for themselves. The recommendation is to appoint a CDS, raise joint functional commands (logistic, special forces, cyber, and space), and issue a National Security Strategy and a National Defense Strategy within 3-5 years. Thereafter establish joint theatre commands, reorganize the organizations to reduce the number of personals within next 6-8 years with initial focus on the operationally active commands. The rapid organizational reforms will also send a strong signal to the India's adversaries. In the future, the success of 'make in India' and FDI will increase the speed of modernization of weapons and equipment.

Recommendations for Further Research

This thesis involved research on India's need to modernize the Indian Army. However, due to limitations mentioned in chapter 1, the thesis has not been able to study certain factors related to the subject. Hence, this thesis makes following recommendations for future research on this topic.

1. Examine how India can formulate a NSS (National Security Strategy) and a NMS (National Military Strategy), who should be the authority to formulate it and what should be the duration.
2. How should India modernize its Air force and Navy without increasing the percentage of defense budget to the GDP.
3. What is the expected impact of DPP 2016, 100% FDI in defense, and 'make in India' policies of the government.
4. Research tactical, technical, and operational capabilities of the Indian Army vis-à-vis China, Pakistan, and for a two front war involving both China and Pakistan.
5. Research potential points of convergence between India and China and how they can be utilized to improve relations between two countries.

Conclusion

The current security situation in India requires the armed forces to prepare for a possible two front war with China and Pakistan. Due to the rapid modernization of Chinese PLA the capability gap between the Indian Armed forces and the China's PLA is increasing. In order to meet the challenges of the twenty-first century and to mitigate the security threats, India should modernize its armed forces. Since the Indian Army is the main player in the security of India, the modernization of Indian Army is of prime importance. With the available resources and the economic condition of the country, rapid organizational modernization and moderate modernization of weapons and equipment is the recommended approach.

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