Challenges to India's Defense Modernization and Moving Forward

OPEN ACCESS

Manuscript ID:
ASH-2022-0904659

Volume: 9

Issue: 4

Month: April

Year: 2022

P-ISSN: 2321-788X

E-ISSN: 2582-0397

Received: 18.01.2022

Accepted: 31.03.2022

Published: 01.04.2022

Citation:
Stalin, Ayadoure S. "Challenges to India's Defense Modernization and Moving Forward." *Shanlax International Journal of Arts, Science and Humanities*, vol. 9, no. 4, 2022, pp. 13–20.

DOI:
https://doi.org/10.34293/sijash.v9i4.4659

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Abstract
India is today confronted with tremendous obstacles as it strives to improve its international reputation. India's strategic location increases the prospect of future challenges (most notably a nuclear threat) with its neighboring country. India's strategic location and recent geopolitical dynamics in South Asia by China's Belt and Road Initiative necessitates India's Defence Modernization to cater to India's National Security facing threats from traditional and non-traditional actors. This study highlights how India's self-reliance in dual-use technology production would give a comparative advantage for India's mandate to achieve modernization of India's Defence Technology. This study discusses the push, pull, and compelling factors for the Defence Modernization where the latter would draw significant inference from Ricardo's Comparative Advantage Theory. This study would conclude by arguing that India needs to diversify its weapon and ammunition, which requires considerable policy correction in Defence Acquisition and Procurement Policy to boost indigenous defence weapon production.

Keywords: Defence Acquisition Procedure (DAC), Comparative Advantage, Dual-use Technology, Atmanirbhar Bharata, and India's National Interest

Introduction

India is today confronted with tremendous obstacles as it strives to improve its international reputation. India's strategic location increases the prospect of future challenges (most notably a nuclear threat) with its neighboring country. When it comes to the threat by the neighboring countries, countering China and Pakistan in the adjacent regions in South Asia is essential to India's national interests. The recent developments in India's immediate neighborhood have prompted the country to review its foreign and security policies. A need for swift modernizing the Indian armed forces is widely acknowledged by several scholars and policymakers, whose repeated remarks have caused the inception of the critical initiatives to manufacture defense weaponry indigenously through schemes like Production Linked Incentive. So that India can handle the complex security concerns posed by its antagonistic neighbors, any policy adjustment for defense modernization shall take into consideration the shifting security perceptions along India's land and maritime borders. Non-state actors in Pakistan with economic and operational might and China's growing diplomatic and geopolitical influence in the Indian Ocean Region moots security concerns that must be addressed by large-scale mechanization of the Indian armed forces to address these critical issues.

The ongoing pandemic caused a valuable lesson to all the nation for self-reliance, and the Indian Government took early cognizance by calling for Atma Nirbhar Bharat.

To bring Atma Nirbhar in Defense Weapon Procurement, the Indian Armed Forces released a list of 101 embargoed item which are in need for Defense Modernization of India, and the Defense Forces stated in that embargo about the corresponding timelines of implementation so that relevant players involved in self-reliant India for defense would proceed to supply such weaponry system. Concoctly, the Indian Finance Minister announced a proposal to make a separate budgetary provision for domestic procurement so that the import list for the military weapons would be negative. As an aspiring great power, India's ability to gain self-reliance and self-sufficiency in developing modern defense hardware and technology to meet the needs of its armed forces will be critical in addressing its national security problems.However, India's military manufacturing sectors have so far failed to meet the country's defense needs. India is one of the world's top arms importers, while indigenous technology manufacturing remains a challenge. As a result, India's defense preparedness remains an issue. Some of the most critical requirements in the services of the armed forces have yet to be met due to significant weaknesses in the defense industry, like lack of research capacity. This study aims to highlight the roadblocks to India's defense modernization and the ramifications for the country's national security. This study aims to highlight the roadblocks to India's defense modernization and the ramifications for the country's national security.

Further now, it continues to state that External factors, such as challenges posed by two of India's main adversaries, Pakistan and China, are likely to impact the country's military requirements significantly. Some analysts believe that China will be the crucial concern though Pakistan will remain an immediate threat. China is more likely to constitute a medium and high threat to India. A rational choice between China and Pakistan as a strategic factor for defense modernization, the Indian Policymakers would give precedence to the former because India outweighs Pakistan in terms of military and strategic abilities. The formulation of India's military priorities is likely to be caused by China's growing offensive capacities, which have sparked serious discussions among military and general academic members about the need for proactive decision-making. These debates are also in tune to chart how India can utilize geopolitical dynamics against China to build its self-reliance in the Defence Industry.To explore the gaps, challenges, and hindrance to defense modernization, an attempt now proceeds to study the pre-existing literature relevant to defense modernization.

India must introspect its needs for defence technology and considerably develop its indigenous defense manufacturing ecosystem locally. With the cognition of inking the foundational four agreements with the USA, India will move closer to import more defence technology. A policy of incremental in defence import would moot several challenges to India's National Security. To put an assertion to validate this claim, the ASSOCHAM, in their report titled "Self-reliance in defence production: The unfinished agenda," has illustrated that "The Indian defence industry's import-export ratio is inferior to countries with a much smaller defence industrial base.India's arms imports are now almost three times as high as those of the second and third largest arms importer that is China and Pakistan" (Assocham and PWC, 2014). The Government of India's Estimate Committee, in their twenty-ninth report of 2018-19 titled "Preparedness of Armed Forces - Defence Production and Procurement," the committee presented the following arguments for the vibrant defence industry in India. The committee suggests that "a vibrant defence industry is a crucial component of effective defence capability, and to achieve national sovereignty and military superiority. The attainment of the same shall ensure: strategic independence, sovereign capability in selected areas, cost-effective defence equipment, collateral benefits ensuing from the endeavors of the defence industry, and to reduce the life cycle cost through indigenous sourcing, facilitating life extension and upgrades of platforms and systems"(Committee on Estimates, 2018). The current preferences of policymakers in Government of India concerning defence production are to attain "military superiority" yet the amicable attitude towards tremendous defence import with stunted indigenous defence production moots a question of what purpose did the offshoot clause achieved in the Defence Procurement Policy of

India? A defence studies scholar Shane Mason in his report for The Stimson Research Center has criticized the Government of India's Defence Budget, Production, and Procurement Policy. In his critique, he states that "India's defense budget is growing at an impressive clip, but rising personnel costs are crowding out resources for modernization. Since the mid-2000s, an increasing share of India's defense budget has been dedicated to pensions and personnel costs. At the same time, capital outlays – investments in weapons systems – are decreasing relative to the rest of the budget" (Mason, 2016). And the Committee on Estimates, in their report, also mentions the imprecise attitude in their analysis of India's Defence budget 2017-18. The Committee states that "in 2016-17, Ministry of Defence spent Rs 3, 45,106crores according to the revised estimates, 1% more than the budget estimates (Rs 3, 40,922crores). This was primarily due to higher expenditure on salaries and pensions of the Army, Navy and Air Force. On the other hand, the expenditure on capital outlay was 8% below the budget estimates 2016- 17. The Government had budgeted to spend Rs 86,298 crores on the purchase of defence capital, but revised estimates provide that Rs 79,327 crores have been spent. Among the three services, the capital outlay on Army, Navy and Air Force was 11%, 11% and 5% lower than Budget Estimates 2016-17 respectively. Salaries and pensions comprise half the budget In 2017-18, salaries and pensions of the defence services form the largest portion of the defence budget (50% of the budget or Rs 1,80,823 crores)"(Committee on Estimates, 2018). Thus the considerable hindrance to the Defence Modernization in India is because "India's defense budget is growing at an impressive clip, but rising personnel costs are crowding out resources for modernization" (Mason, 2016). To support this assertion, Prof. Harsh V. Pant suggests where he takes a stance to support the references of the Committee of Estimates by stating that "India's defense modernization efforts ultimately depend on reforming and building an efficient procurement and indigenous production capability. One of the fundamental issues relate to funding allocated for national security and the share of those funds for defense modernization or capital expenditure. The defense budget in recent years has fallen to about 1.5 percent of India's GDP, with an increasing component of funding allocated towards salaries, pensions and other operating expenses. Personnel costs are crowding out resources for equipment, with India's standing army among the world's largest, second only to China's. The shrinking amount for capital expenditure leaves the army, navy and air force falling short in modernization goals with implications for India's defense posture"(PANT & DAS, 2019). To an extent, the budgetary expenses highlight the hindrance to defence modernization; now, this moots another question to examine how India can achieve a comparative advantage in Defence Manufacturing through Make in India if the capital spending is very feeble?

Now this study would proceed with an objective to highlight the structural hindrances for India's Defence Modernization. This study will also examine the already proffered query through two sections. The first section will explain India's National Security threats and its driven opportunity for modernization. Further, the arguments placed in the first section would be based on Rajat Ganguly's arguments for "India's Military: Evolution, Modernization andTransformation."Now, the second section will argue for the compelling factors for modernization and innovation in India's indigenous defence production. In the second section, the arguments will infer the Ricardian's Comparative Advantage principle to justify the need for India's self-reliance in dual-use technology's production, which would drive India's Defence Modernization. In its last section, the study will conclude by arguing that India needs to diversify its weapon and ammunition, which requires significant policy correction in Defence Acquisition and Procurement Policy to boost indigenous defence weapon production.

India's Defence Modernization: Push and Pull Factors

The Indian aerospace and defence (A&D) market are among the most attractive globally, and the Government of India is keen to leverage such global opinion to promote investments into the sector. However, the indigenous capacity to exploit this market potential by allowing adequate local production was mainly with Defence Laboratory and

Institutions like DRDO. However, efforts were made to utilize this market potential. But the bureaucratic red-tapism (Economic Times, 2018) and complex business conduct of rules often created magnified hurdles to the indigenous defence production project's investment; for example, complete production of the Light Combat Aircraft Tejas took several years from the 1980s' to the successful demo in 2017. To fuel more to the concerns, the most debated issue in India's Defence Modernization to achieve self-reliance is that "the Indian defence industry's import-export the ratio is inferior to countries with a much smaller defence industrial base" (Assocham and PWC, 2014). A recent report by SIPRI in its yearbook 2020 states that "India's spending of $71.1 billion ranked it as the third-largest spender for the first time" (SIPRI, 2020), and Rajat Ganguly in 2016 argued that "Military transformation means something more than simply a revolution in military affairs"(Ganguly, Indian military transformation in the twenty-first century, 2016). To create a revolution, adequate investments are precedential, and to serve this purpose, the Government of India has constituted Technology Development Fund (TDF). TDF was to promote self-reliance in Defence Technology (indigenous production) as a part of the Make in India initiative. The Committee on Estimates that the TDF "has been established to encourage participation of public/ private industries especially MSMEs so as to create an ecosystem for enhancing cutting edge technology capability for defence application. The scheme covers funding through grants to industry that may work in collaboration with the academia or research institutions to carry out innovation, research and development"(Committee on Estimates, 2018).

Rajat Ganguly notes that in the post-cold war era, India's Security and Strategic planning, along with China's growing assertiveness, it has included "India's spending on defence and its military transformation was also influenced by the situationprevailing in Afghanistan and Pakistan"(Ganguly, India's Military: Evolution, Modernisation and Transformation, 2015). Optimistically, Shane Mason signifies that India is doing well to increase its capital expenditure by stating that "India increased defense modernization spending after the 1999 Kargil War and Operation Parakram in 2001-2002. Overall defense spending increased 30 percent between 1999-2005, and capital outlays rose from 21 percent to 38 percent of the budget"(Mason, 2016). An inductive inference when made with the writing of Rajat Ganguly where he states in the last two decades (almost coincides with the Post-Kargil Era) "the Indian military has focused on procuring modern high-tech weapons for all three services. The main aim of these procurements has been to give the military not only a more robust defensive capability but also to enable the military to project offensive power in India's immediate region and beyond, to mobilize quickly and launch counterinsurgency and special operations, and to undertake humanitarian missionswhen required. The three services are also developing and revising their strategic doctrines to reflect better upon the key changes to India's immediate, regional and global strategic environments, their rising prowess and the various tasks and challenges confronting the forces" (Ganguly, India's Military: Evolution, Modernisation and Transformation, 2015). From a Classical Realist perspective, the steady increase in the capital expenditure in the defence budget can understand that "India has long faced security threats which call for rebuilding its armed forces, but poverty and limited access to modern weaponsrestrained military capability and strategic choices. A decade of sustained economic growth is removing the financial constraints on national power" (Dasgupta & Cohen, Arms Sales for India: How Military Trade Could Energize U.S.-Indian Relations, 2011).It is also to be understood that India has incorporated a clause in its procurement policy for defence modernization which is critical to emphasize because for modernization India has exploited several gaps to move beyond capital expenditure. India, in its defence procurement policy, has a clause titled "Offset Clause." The primary objective of the offset clause is "to leverage the capital acquisitions and technology to develop Indian defence industry by (i) fostering development of internationally competitive enterprises, and (ii) augmenting capacity for Research, Design and Development related to defence products"(Ministry of Defence).

However, in 2020 the Ministry of Defence (India) informed the Parliament that they are

amending the Defence Acquisition Policy to state that there would no offset in the contracts involving parties of Government-Government, Inter-Government, and Single Vendor. But the offset is not entirely scrapped as it is applicable for other contracts involving multi-vendor parties. In that observation, the Special Secretary and Director General (Acquisition) explained the reason for this policy shift by stating the buyers who committed to the acquisition contracts are not obliging to the offset requirement, thereby amending the applicability.To understand the rationality of such policy correction, Rajat Ganguly then argued that expanding the defence relation with larger defence producing countries is imperative for modernization. To quote Rajat Ganguly's postulate, he claimed that "To speed up the Indian military's development and modernization drive, the Indian government paid attention to expanding defence relations with a large number of countries" (Ganguly, India's Military: Evolution, Modernisation and Transformation, 2015). The expansion of defence relations beyond military exercises regularly includes technology transfer. To liberalize impediments and enable hassle-free defence relations, the revision in the offset clause could be justified. But there is another perspective to introspect what other prescription needs would be considered when the offsets are overlooked. Because self-reliance does not moot indigenous-based production by being in isolation. It needs to be discussed, which would be illustrated in the second section. The push and pull factors for the Defence Modernization would be possible if the Government of India pushes the required capital expenditure to the desired limit. Simultaneously liberalizing specific clauses like Offset would pull more technology transfers that adequately foster modernization.

India's Defence Modernization: Compelling Factors

The domination of Russia's import to India's Defence Arsenal has pushed India to spend its sizeable share of the capital expenditure on the up-gradation of those weapon systems. Still, India's attempt to "to enhance the Indian military's reconnaissance, precision-strike, and command and control capabilities, which are cornerstones of the so-called Revolution in Military Affairs" (Ladwig, 2015). Though it seems to be strategic when excluding the opportunity cost, which drains the capital expenditure towards the Russian Imports' upgrades in India's Arsenal, there is a drawback when taken into factors given in table 1. The Russian Arms dominance in South Asia, especially vis-a-vis India and China, stands at 56% and 76% respectively of theirs total arsenal capacity. When literature traced about the means of China's defence modernization, they sufficient argues that an offshoot of research on the scrapped Russian Imports in China's Arsenal caused innovation in China's defence production; thereby, moots a possibility of greater interoperability services like China offering cheaper upgrades or replacement or innovations to the other South Asian Countries with the Russian Arms. Another scholar quotes illustration of how China had achieved interoperability and modernization, where he states that "Chinese weapons systems produced before the late 1990s included the J-6, J-7, and J-8II fighters (the J-6 and J-7 were, respectively, licensed-produced versions of the Soviet MiG-19 and MiG-21 fighters), the JH-7 fighter-bomber, the Silkworm anti-ship cruise missile (ASCM), the 600-km range DF-15 and the 300-km range DF-11 surface-to-surface missiles (SSMs), and the Type-035 Ming-class submarine (a licensed-produced version of the Soviet Romeo-class)"(Bitzinger, 2015). Further when these observationsare inferred by rationalizing the arguments propounded in the US's Department of Defense Report on China's Military Power, where the report states that "the PLA's objective is to become a world-class military by the end of 2049—a goal first announced by General Secretary Xi Jinping in 2017. Although the CCP has not defined what a world-class military means, within the context of the PRC's national strategy it is likely that Beijing will seek to develop a military by mid-century that is equal to—or in some cases superior to—the U.S. military, or that of any other great power that the PRC views as a threat. As this year's report details, the PRC has marshalled the resources, technology, and political will over the past two decades to strengthen and modernize the PLA in nearly every respect"(Department of

Defense, USA, 2020). Read along with the Ricardian's perception of the theory of Comparative Advantage, there would be an assertion mooted to state that China is "objective is profit maximization or, in more sophisticated versions, wealth maximization, that is, the maximization of the net present value of future"(Hunt & Morgan, 1995) and China is able to pursue this enormous maximization significantly due to its precedence for the "economic development as the central task and the force that drives China's modernization across all areas, including its armed forces"(Department of Defense, USA, 2020). Table 1 depicts that India has considerably decreased its arms import; the timeline of these changes is between 2010-14 and 2015-19. At the same time, there is a modest increase in China's imports. Several scholars observe this modest increase in China's imports. But some scholars believe that "Chinese arms imports fell from US$3.54 billion in 2005 to US$1.4 billion in 2014—an indicator that China is getting closer to realizing its long-cherished goal of self-sufficiency in arms acquisition"(Bitzinger, 2015). However, the modest increase in import share in the earlier stated timeline is primarily because China's recent policy for its defence industries mainly aims to secure more dual-use technology. China can explore more potential of having their satellite variants that serve both military and peaceful activities. The increased import of dual-use technology and recent tangible progress in China's Space Mission draws another inference from the comparative advantage principle that China intends to achieve "the superior innovativeness of market-based economy" (Hunt & Morgan, 1995) and further intends to "hold a comparative advantage in different goods"(Oatley, 2019). What rationality is achieved through such posture is that though the China import several dual-use technologies but these technologies are utilized to enhance its stealth capacity; thereby, China benefits and attains its ultimate self-reliance of being a "World Class" military.

Table 1 Comparison of India and its Neighbour on Arms Import

Country	Share of Arms Import. (%)		Percentchange from 2010-14 to 2015 -19	Main Suppliers (Share of importer's total imports) – 2015-19. (%)		
	2015-19	2004-14		1st	2nd	3rd
INDIA	9.2	14	-32	Russia (56%)	Israel (14)	France (12)
CHINA	4.3	4.4	3.3	Russia (76)	France (8.8)	Ukraine (6.9)
PAKISTAN	2.6	4.5	-39	China (73)	Russia (6.6)	Italy (6.1)
BANGLADESH	1.6	0.9	93	China (72)	Russia (15)	UK (2.4)
MYANMAR	0.7	1.1	-32	China (49)	Russia (16)	India (14)

Source: Sirpi Yearbook 2020

To attain self-reliance, India needs to be objective by stating its path for reliance. Under the Atmanirbhar Bharat's initiative, the Ministry of Defence has released its indicative list where players would be encouraged to bring innovation for modernization. In a press release by the Press Information Bureau that "A DRDO delegation met with Raksha Mantri Shri. Rajnath Singh today to apprise him about 108 systems and subsystems which have been identified for designing and development by the Indian Industry only..... This initiative will pave the way for the Indian Defence industry to develop many technologies towards building an Atmanirbhar Bharat.DRDO will also provide support to industries for design, development and testing of these systems on a requirement basis"(Ministry of Defence, 2020). Further to aid self-reliance, the Government of India has announced an embargo of several products which the Government believes that the "aim behind the promulgation of the list is to apprise the Indian defence industry about the anticipated requirements of the Armed Forces so that they are better prepared to realize the goal of indigenization"(Ministry of Defence, 2020). It must be understood that most of the products on the embargo list consist of technologies called SONAR, RADAR, Floating Docks, and Simulators etc., which are of dual-use potential. As China has a piecemeal dependence on dual-use technologies for its modernization, India's Atma Nirbhar for defence industries has a definite

aim to attain self-reliance for dual-use technology. However, there needs a colossal policy correction to facilitate self-reliance in India's defense industry, and the mandates of offset clauses are not obliged by the external party is also worrisome. Some scholars always argued that "key drivers of India's military modernization were lessons learned from past wars"(Ganguly, India's Military: Evolution, Modernisation and Transformation, 2015). But the criticism mooted by Lt. General H.S. Pang that "India's foreign policy and cultural pacifism also did not allow us to become a major arms exporter" (Panag, 2020). In his commentary article, Lt. General H.S. Pang quoted several episodes witnessed in his official capacity, and in that one, he states that "India discarded the French AMX 13 tank — considered obsolete — for want of refurbishing capability of our defence industry in the mid-1970s. It was bought by Singapore as junk and refurbished with a modern fire control system and a 105-mm gun. I saw these tanks fully operational in 2006 when Singapore was carrying out joint training with us at Babina". In this argument, Lt General H.S. Pang (retired) emphasized that India does not properly exploit decommissioned or scrapped technology's potential for modernization. Nevertheless, this section concludes by stating that India, in its self-reliance, should aim for Atmanirbhar in dual-use technology to attain comparative advantage to secure a niche place in international export promotion in world trade. However, utilization scraps and decommissioned defence technology and means to exploit offset condition is imperative for modernization.The lacunae exploited are the compelling factors along with caveat for India's defence modernization.

Concluding Observations

There has been a continuous debate on preparedness for India's defence modernization bottlenecks owing to several traditional and non-traditional threats to India's national security, adequate defence readiness is critical to safeguarding the country's national interests. Creating and buying innovative complex weaponry with high end technologies are imperative to ensure that the armed forces' demands and requirements are met. Mooting India's Defense Modernization as a central theme to this study, a comprehensive analysis on the push, pull, and compelling factor to India's Defence Modernization are explained with arguments justifying the need for dual-use technologies which would earn India anunique position in the International Defence Trade market. But the obstacles associated with the policymakers to fructify the offset clause further moots a concern of how India can capitalize in the defence modernization on a mission mode to attain self-reliance. Thus, this study suggests that India's Defence Procurement Policy needs revision to add a third category to favour the offset clause through its documental analysis methodology. The existing procurement policy favours only two classes of defence procurement which are "Buy (Global" and "Make and Buy"; this study proposes a suggestion of having a third category called "Buy, Research, and Make." This suggestion for a third category fosters a new ecosystem where the decommissioned, scrapped, and new multi-vendor deals must commit specific requirements. The decommissioned and scrapped defence technology shall be utilized for research mainly through pools of MSME of how to attain modernization of control, firing, and sensors system. Such prompt research on decommissioned and scrapped technologies could be treated as a "dual use technology". And the research-driven on such technology would aid innovation along with the necessary revision to the offset clauses would guide India towards generic research. A clarity shall be understood that the primary reason for suggesting a shield in the offset clause is to enable reciprocity in the defence cooperation based on technology procurement. Thus, this study concludes by highlighting that India's defence modernization needs adequate research and technology transfer which offset clause would facilitate by ensuring reciprocity. Such reciprocal defence procurement would diversify India's Defence Potential to nurture comparative advantage in many defence technology productions and provide capabilities to attain Atmanirbhar Bharata.

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