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Article

The Conundrum of Self-Reliance in Defence Capability in the Indian Context: A Qualitative Study

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Abstract

India relies heavily on imports to meet its defence equipment needs. Despite launching several initiatives for indigenization and self-reliance (Aatmanirbharta), India continues to head the list of the top defence importers in the world. Many innovative initiatives were taken in the recent past to boost the defence manufacturing ecosystem. The defence acquisition procedures have been revised to meet the goal of indigenization. Negative import lists have been promulgated while joint ventures with foreign manufacturers are encouraged. Still, the achievement of self-reliance in defence capabilities seems elusive. A literature review was carried out to understand relationships between various factors impacting the achievement of self-reliance in defence capability. The literature review findings highlighted major factors that impact the achievement of self-reliance in defence capabilities, such as the defence budget, military capability structure, defence technology, and procurement policies. Based on the inputs from the literature review, a qualitative study was undertaken to get further clarity on the subject. The qualitative study sought inputs from experts from the armed forces, industry and think tanks. The aspects that emerged during the qualitative research reinforced and gave new insights into factors such as the strategy to meet security threats, the defence budget allocation trends, challenges in developing critical defence technologies, the need for a vibrant defence manufacturing ecosystem, and efficient procurement procedures. Based on the findings of the qualitative study, a revised conceptual model for the achievement of defence self-reliance in defence capability has been presented.

Keywords: *Defence Indigenization, Defence Budget, Defence Technologies, Defence Acquisition.*

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1. Introduction

India is heavily dependent on imports of defence equipment and currently heads the list of arms importers globally (Stockholm International Peace Research Institute (SIPRI, 2022a). This is despite possessing a well-established defence industrial capacity since the 1950s and a defence research and development organisation (DRDO) to support the development of indigenous technologies. After the Kargil conflict in 2001, to encourage defence manufacturing, the defence sector was opened to private industries. Several initiatives, such as the 'Make in India' drive, were launched. The procurement policies and procedures were revamped with a preference for indigenous procurement following the promulgation of the Defence Acquisition Procedure (DAP) 2020. Despite all such initiatives, the vision of self-reliance in defence capability seems far from being achieved (Behera L.K., 2021). Despite all such initiatives, Indian dependence on arms imports remains high. From 2016 to 2020, 84 per cent of all arms imports were of foreign origin, including licensed manufacturing (SIPRI, 2022b). Indian defence procurement continues to be mired in slow, arduous and antiquated bureaucratic processes. Indian defence products remain of poor quality and costly despite the country's booming civil manufacturing prowess (Bitzinger Richard, 2015).

2. Literature Review

A literature review was carried out to understand relationships between various factors impacting the achievement of self-reliance in defence capability. The literature review findings highlighted key issues from which research questions were framed for the qualitative study. Those aspects are given in succeeding paragraphs.

- **Allocation of funds for the achievement of self-reliance in defence capability**

In 2021, Indian defence expenditure was the third highest in the world, with a slight increase of 0.9% from 2020 but up by 33% from 2012 (SIPRI, 2022 b). However, the Indian defence budget is currently below 2 per cent of India's gross domestic product, which is insufficient for genuine modernization to enhance the combat capabilities of Indian defence forces (Kanwal G & Kohli N, 2018). India's volatile borders with China and Pakistan require a large standing defence force. However, India does not have strategic reach due to its inadequate military capability (Tellis, 2020).

- **Indigenous Military Capability Building Structure**

Military capability essentially translates to the quality of equipment and manpower. Rapidly developing technologies such as robotics and artificial intelligence impact the nature of warfare and, consequently, the type of military capabilities that need to be built (Predd et al., 2021). Expenditure on manpower takes up a major portion of the defence budget; hence, the optimum mix of permanent and reserve manpower and supporting civilian staff is crucial (McIntosh et al., 2021). Creating indigenous military capabilities may be prohibitive; therefore, establishing security alliances with bigger or other powers is a cost-effective option to combine military capabilities and dissuade adversaries (Joiner et al., 2019). The source and nature of technology, along with employment characteristics of the military equipment, such as Western origin or Russian origin, play an important part in synergising operations and logistics, such as repair and maintenance of the equipment (Chang, F., 2022).

- **Research and Development for Indigenous Military Capability**

Many ambitious 'Make in India' programmes have failed to make headway due to poor project management and a lack of resources (Patel & Tripathi, 2022). The Parliament Standing Committee on Defence recommended the allocation of 25 per cent of the research and development funds to the private sector, academia and startups and close coordination of the DRDO with academia and the private sector (Standing Committee on Defence, 2022). The public sector enterprises have also not been innovative (Bhatta, 2018). Collaborative development of defence technologies in partnership with foreign countries is a good option to develop indigenous defence technologies (Cowshish, 2017).

- **Procurement Approaches for Acquiring Indigenous Military Capability**

Indian defence purchase procedures remain complex and long-lasting, leading to excessive delays and associated cost implications (Kumar, 2013). In addition, there is a lack of strategic direction in laying down the required military capability (Raza & Shekhar, 2021). The call is also for shifting from archaic public sector enterprises to efficient private industries. However, the establishment must incentivise the private sector with continued defence procurements (Markowski & Hall, 1998). The private sector would naturally increase competition in defence procurement, and products would become cost-optimised (Greenwalt, 2013). Electronic bidding can bring transparency and reduce procurement timelines (Sampaio et al., 2022). Finally, it is seen that local procurements often have technology challenges while foreign procurements have contractual risks, both of which have financial implications for the purchaser (Oishee K, 2021).

3. Methodology

The research questions for the qualitative research were framed based on the key aspects that emerged during the literature review, as given in the preceding paragraphs, to obtain further insights into the factors affecting self-reliance and defence capability. The following research questions (RQs) were considered for getting qualitative inputs for further study and analysis:

RQ 1. Is building self-reliance in defence capability essential to face geopolitical threats and safeguard national interests?

RQ 2. Would allocating the required defence budget, promoting indigenous defence R&D, and setting up a vibrant manufacturing system lead to self-reliance on defence capability?

RQ 3. Will pursuing self-reliance in defence capability lead to overall savings in defence expenditure in the long run?

RQ 3(a). Should the defence budget be pegged at 3 per cent of the GDP, as the Standing Committee on Defence (2018) recommended, to build the required defence capability and achieve self-reliance?

RQ 3(b). Will an enunciated national security strategy and military doctrine with the essential Indian military capability ensure adequate defence budget allocation?

RQ 3(c). Can the revenue budget be reduced through measures such as payment of salaries/ pension of retired defence civilians by other ministries or financial institutions and paying proportionally only for the retained manpower in short-term military service, such as the "Agniveer scheme" to increase defence capital budget availability?

RQ 3(d). To reduce salary and pension budgets, should the military pensionable age be increased to 60 through transfer to non-combat, logistic units and defence civilian posts, since healthy life expectancy in India is growing beyond 70?

RQ 4. Is establishing security alignments with big powers an option to reduce overall defence budget expenditure and meet grave external security threats, especially from a superior adversary?

RQ 4(a). Will concentrating on emerging technologies such as AI, robotics, and cyber security, which require lesser budgets, lead to pursuing new warfare doctrines based on autonomous and long-range weaponry and hybrid warfare and optimum budget utilization and growth of indigenous capabilities?

RQ 5. Will limiting state-of-the-art equipment imported by the Indian Armed Forces to a fixed percentage help the indigenous industry focus on the balanced quantity of military hardware and make them invest in matured defence technologies to upgrade and replace current equipment?

RQ 5(a). Does the general unsuitability of imported equipment for Indian warfare concepts, weather, and terrain conditions make developing indigenous equipment necessary?

RQ 6. Will the reorganization of indigenous Defence R&D efforts, including restructuring of DRDO, streamlining of R&D of defence public sector companies, and earmarking of specific R&D budgets for the private industry, lead to the achievement of self-reliance in defence technologies?

RQ 7. Will simplifying procurement policies result in greater participation of indigenous industries in defence procurement since the long-drawn-out procurement processes disincentivize domestic industries from participating in defence procurement?

3.1. Qualitative Analysis Respondents.

A panel of potential experts was chosen to address the above research questions. The experts were selected based on their professional background and experience in defence procurement. Senior defence officials, both serving and retired, with intimate knowledge of defence procurement were contacted. Due to the subject's sensitivity, many sought an assurance of anonymity, and seven senior defence officials agreed to provide their responses. Two CEOs from private industry and two 'think tanks' were added to the respondents list. The questions were given to the selected list of experts on a digital platform to give their viewpoints without restrictions on the length of their responses. The list of respondents is given below.

Senior Defence Officials	Industry Leaders	Thinktanks	Total
7	4	2	13

Table 1. The list of respondents.

Source: By Author

4. Qualitative Response Analysis

The responses from the expert for each question were tabulated and summarised. The similarities in responses were clubbed together to bring coherence and flow. Objective responses were highlighted in the summary. There were contrarian views for each question, too. They have been listed separately. The summarised responses are given below each question.

RQ 1. Is building self-reliance in defence capability essential to face geopolitical threats and safeguard national interests?

Most respondents agreed with the need for India to be self-reliant in defence capability to safeguard its national interest due to the country's geopolitical threats. The aggressive posturing by inimical countries makes India need to be self-reliant in defence to deter their devious designs. India needs to develop self-reliance in defence equipment since long conflicts need indigenous capability to ensure the sustenance of its defence forces and surge in equipment demands. Developing the required defence capability is obvious for India to maintain its strategic autonomy and exert its regional power status. A robust defence industrial base will contribute towards exports, contribute to the economy, and enable power projection.

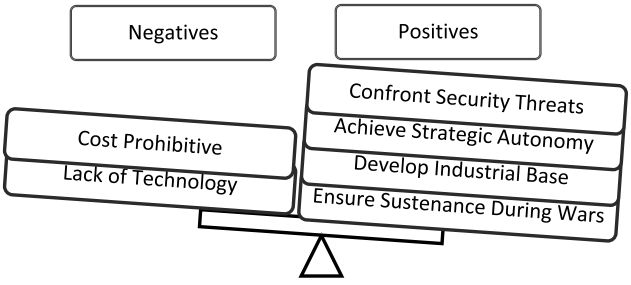

Figure 2: Need for Self-reliance in Defence Capability

Source: By Author

However, few respondents expressed apprehension that the goal of complete self-reliance is difficult to achieve and would be unaffordable. They felt that it is difficult for nations to achieve complete self-reliance. No country other than superpowers can be said to be self-reliant. There are many challenges in developing niche defence technologies. It is also cost-prohibitive. The state of India's defence R&D is far below global standards. If Indian defence forces buy only equipment made in India, they would fall behind the curve and be forced to use obsolete technology platforms, adversely affecting national security.

RQ 2. Would allocating the required defence budget, promoting indigenous defence R&D, and setting up a vibrant manufacturing system lead to self-reliance on defence capability?

Most respondents believed that budgetary allocation would remain the backbone of any capability development programme, and the cost of R&D also needed to be factored into it. Indigenous military capability must be built collaboratively with the defence forces, industry, and academia to build a vibrant and robust defence R&D and industry ecosystem. The private sector should be energized in defence production, and R&D by the private sector needs to be encouraged. Suitable financial support should ensure confidence in final procurement from indigenous manufacturers.

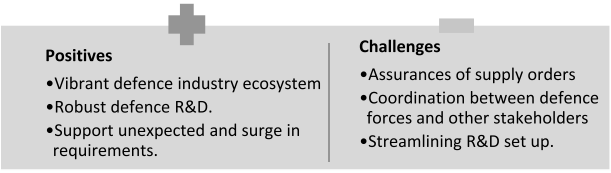

Figure 2: Outcomes of budgetary support for achieving indigenous defence capability

Source: By Author

There were contrarian views that a defence industrial ecosystem could only be established based on assured orders. With budgetary support and sure orders on the successful development of the products, the development and production agencies can invest their resources optimally. A few respondents felt that resource allocation is not the sole reason for the lack of achievement of self-reliance in defence technology and, consequently, in defence capability. Adequate resource allocations and funding were provided to DRDO, but it has failed to deliver.

RQ 3. Will pursuing self-reliance in defence capability lead to overall savings in defence expenditure in the long run?

Most respondents felt that relying on imports is costly and that pursuing self-reliance in defence capability will lead to savings in defence expenditure in the long run. In-house production would be cost-effective and easy to ramp up when needed, especially during the unexpected start of hostilities or a surge in a conflict. However, imports may sometimes be necessary to tide over non-existent or below-par locally-made products temporarily. Once matured in the indigenous ecosystem, a lower technology spectrum will undoubtedly bring larger benefits with the same budget.

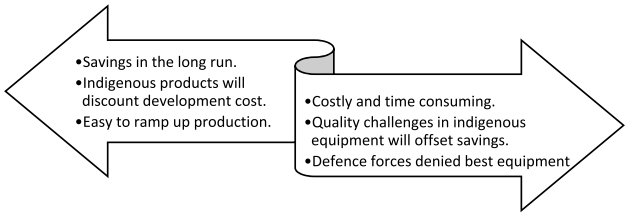

Figure 3: Savings in defence expenditure from the pursuit of self-reliance.

Source: By Author

There were opposing viewpoints that building indigenous defence capability is costly, long-drawn and time-consuming. Niche technology-based equipment or systems developed indigenously will cost more and must be imported. Also, the poor quality of indigenous equipment will offset savings, if any. Therefore, it is better to import critical and high-technology equipment to equip the forces, which could even be a percentage of the overall holding of the equipment. The building of indigenous capability, being a long-drawn process, may be carried out parallelly with imports to meet immediate requirements. The road map for local production may be a mix of self-reliance and collaboration with reliable partners.

RQ 3(a). Should the defence budget be pegged at 3 per cent of the GDP, as the Standing Committee on Defence (2018) recommended, to build the required defence capability and achieve self-reliance?

The majority expressed the view that it is necessary to benchmark a high percentage of the GDP for defence capability building, considering the current drive to achieve self-reliance in complex defence technologies; the present allotment of less than 2% of GDP is barely sufficient to manage priority procurements and for modernization of defence forces. While the allocation of 3% of GDP for defence requirements may be a rough guide considering past allocations and positive trends in our national GDP, the provision should be flexible since there is always the possibility of a surge in defence

requirements given emerging geopolitical situations or for induction of niche and expensive technology or equipment. The security situation along India's borders makes possessing a deterrence capability essential. For procurement of the latest weapons and armaments to achieve such a capability, more GDP allocation is necessary, considering the capability and expenditure on defence.

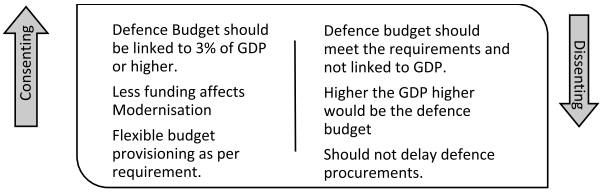

Figure 5: Fixed percentage of GDP for Defence Budget Allocation

Source: By Author

However, there were a few contrarian opinions that the defence budget should not be linked to a percentage of the GDP but should meet the security needs. The core need is to keep growing the GDP and not the percentage of budget allocation. It is also felt that the current budgetary allocations are sufficient for 'Committed Liabilities', leaving a marginal share for modernisation. A guiding percentage of GDP must not be laid down for defence budget allocation. Even if laid down, it should not delay procurements that affect operational preparedness in defence capabilities.

RQ 3(b). Will an enunciated national security strategy and military doctrine with the essential Indian military capability ensure adequate defence budget allocation?

Most respondents believed that a clear national security strategy and military doctrine are essential to guide strategic, structural and functional aspects of defence capability. As its derivative, the national security strategy and the military doctrine will certainly provide greater orientation towards acquiring capabilities. The military doctrine would influence the entire spectrum of military capabilities requirements per the current geo-political situation and threats. It will also be the first step in pursuing an all-inclusive defence R &D and a production and procurement plan. However, there is a need for political will and consensus to support the development of military capability in line with the national security strategy.

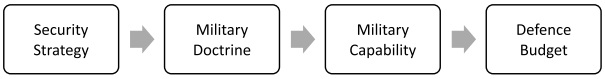

Figure 4: Impact of Security Strategy and Military Doctrine on Defence Budget Allocation

Source: By Author

Some respondents argued that no direct link exists between national security strategy, military doctrine, and defence budget allocation. The allocation of the defence budget depends on the availability of funds and the national economic priorities and may not be dictated by national security strategy. National security strategy is merely an indication of intent which may or may not be in the public domain. However, clarity in the desired defence capability required for the nation makes it easy for the government to plan and allocate appropriate funds for defence.

RQ 3 (c). Can the revenue budget be reduced through measures such as payment of salaries/ pension of retired defence civilians by other ministries or financial institutions and paying proportionally only for the retained manpower in short-term military service, such as the "Agniveer scheme" to increase defence capital budget availability?

Respondents generally agreed that expenditure on manpower is a necessary commitment in the armed forces. However, there is substantial scope for innovative measures to address the salary and pension outgo to reduce the defence revenue budget. The pension component of defence civilians is much higher than that of the pension component of uniformed personnel due to their extended service periods. A scheme to separate the burden of pay and pension of defence civilians from the pay and pension of uniformed personnel may be considered. Human resources are the most important component of the armed forces, and schemes like 'Agniveer' to reduce

the revenue outgo, among other benefits such as increased employment to rural youth, are much needed. However, introducing such policies should not adversely affect the capability of the armed forces due to the reduced engagement period. Lateral absorption of defence personnel into other government departments, paramilitary forces and Central Armed Police Forces is a better choice.

Few respondents stated that a nation's defence cost alone cannot be weighed on economic cost. While defence cost-cutting measures may be introduced for economic reasons, knee-jerk actions may be detrimental to the functioning of the armed forces. Revenue expenses related to salaries and pensions are central to maintaining the morale of the defence personnel. Better salaries and pensions help bring more volunteers to the armed forces. If saving money reduces the effectiveness of the armed forces, it should be avoided.

RQ 3(d). To reduce salary and pension budgets, should the military pensionable age be increased to 60 through transfer to non-combat, logistic units and defence civilian posts, since healthy life expectancy in India is growing beyond 70?

Most respondents felt that the proposal to laterally transfer personnel of combat units after a certain period of active service could be evaluated and implemented without compromising the stakeholders' morale and motivation. The induction of well-experienced combat personnel to logistic units could energise them and also make the logistic units more efficient and empathetic in their performance of duties. Some apprehensions were expressed about the proposal's feasibility since logistic units also get deployed in difficult conditions, though the nature of duties would be less strenuous. Therefore, some respondents felt that the transfer of combatants may only be carried out to defence civilian posts as military non-combat roles also need physical fitness to operate in field conditions.

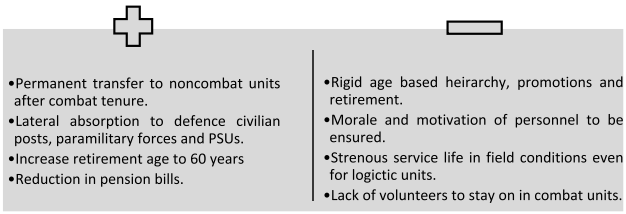

Figure 6: Management of Manpower

Source: By Author

Managing all personnel serving up to 60 years in various fields would require careful analysis and practical implementation. Transferring combatants to non-combat roles with retention of seniority may upset the structure and functioning of logistic units. The implementation may be very complex initially and may take a long time to make the flow of manpower from combat units to non-combat units on permanent absorption smooth and organised. The superannuation of all personnel on a permanent cadre at 60, subject to medical and physical fitness, would make the armed forces a good career option. In the long run, it would also reduce pension bills since the period of drawing a pension would be substantially reduced.

Some respondents felt that the lateral transfer of combat personnel after stipulated short service to defence civilian posts is a more feasible option with assured full pensionable service than transfer to non-combat units within the defence forces. Retaining core personnel may pose challenges since very few may decide to stay on due to the strenuous nature of the combat duties, and most would like to move to civilian posts.

RQ 4. Is establishing security alignments with big powers an option to reduce overall defence budget expenditure and meet grave external security threats, especially from a superior adversary?

Most respondents thought it may be impossible for India to counter a strong and aggressive China. Facing threats on its own without friends and allies may not be prudent in the global comity of countries. Forming a strategic alliance with like-minded countries would be beneficial in reorienting their own

defence capability to address specific threats rather than creating a comprehensive defence capability with large defence spending. By systematically and ingeniously picking areas of defence capability building, the overall defence expenditure can be optimised to have financial savings as spinoffs.

However, there were apprehensions about establishing security alignments with big powers to reduce defence expenditure since such arrangements come at a great strategic cost. The current situation in India's northern borders and areas abutting its exclusive economic zone makes strategic alignment with other powers advantageous in putting pressure on the bigger and more capable adversary. The evolving security alignments were formed mostly due to the converging strategic interests of the countries involved. However, how far these countries will come forward to actively render military and other support in case of an outbreak of hostilities is a moot point. Therefore, acquiring self-reliant deterrence capability would still be necessary to cater for all eventualities and consider the security alignments with similar strategic interests as an enhancement tool for posturing.

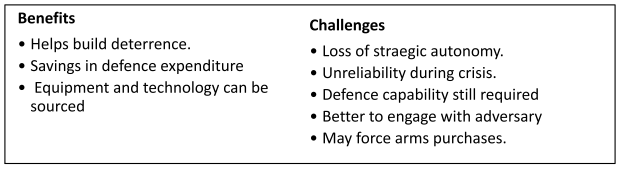

Figure 7: Security Alliances with Bigger Powers

Source: By Author

There were also diverse views that while efforts are being taken to align and enter defence alliances with other countries to counter the larger adversary, India must pursue the path of dialogue and reconciliation to improve relations with China. In the final analysis, India will have to fight its own battles and build its own credible self-reliant defence capability to thwart the aggressive designs of China and make any such adventure prohibitive. Few respondents felt that security alliances might also coerce India to purchase weapons and technologies from the partners to ensure compatibility for joint operations. These purchases may lead to increased expenditure and dependency on those countries. A credible deterrence comes with a strong internal defence capability.

RQ 4(a). Will concentrating on emerging technologies such as AI, robotics, and cyber security, which require lesser budgets, lead to pursuing new warfare doctrines based on autonomous and long-range weaponry and hybrid warfare and optimum budget utilization and growth of indigenous capabilities?

Cheaper drones and autonomous systems have transformed the battlefield dynamics in the ongoing conflict in Ukraine. Inexpensive FPV drones, modified from commercially available drones, are successfully used against sophisticated and expensive platforms such as battle tanks and air defence systems. After the extensive use of costly weapon platforms reminiscent of the Gulf Wars initially and hybrid warfare using unconventional tactics, a new form of remote warfare using missiles and weaponised suicide drones has taken hold. The current warfare is witnessing extensive use of surveillance devices and AI to gather intelligence coupled with ingenious use of UAVs and electronic warfare by both sides to degrade each other's military capability. Most of the new technologies used in the Ukraine war have not been developed exclusively for defence uses, with enormous costs, as with most defence equipment. The war also saw the use of commercial LEO and MEO satellites, especially the Starlink System, for military communication and other purposes. Most of the development in such transformative technologies is spearheaded by giant commercial organisations with little or no government or defence establishment support. Using commercially developed technology for military use would be a cost-effective way to save defence expenditure. Products such as the FPV drones and loitering ammunition for one-time use are cheap, and their production can be scaled up in times of hostilities with little infrastructure. Their upgradation can be done based on commercial development.

However, few respondents have highlighted that conventional weapon, such as artillery guns and missile systems with longer ranges, which are being used to great impact in the Ukraine conflict,

are not replaceable. They need to be augmented and upgraded. One factor is the integration of new technologies, such as UAVs for surveillance, target acquisition, targeting and post-strike analysis for these long-range weapon systems. FPV drones with limited range in the front line may be inexpensive. However, developing robust UAV platforms for surveillance would not only be expensive but would require constant upgradation due to the threat of passive electronic countermeasures and active anti-UAV systems. Commercially, technologies like AI and robotics have made one facet of warfare inexpensive. Therefore, a balanced focus on developing emerging and conventional capabilities may be more appropriate.

RQ 5. Will limiting state-of-the-art equipment imported by the Indian Armed Forces to a fixed percentage help the indigenous industry focus on the balanced quantity of military hardware and make them invest in matured defence technologies to upgrade and replace current equipment?

The respondents felt that as a guiding principle, it may be helpful to the indigenous industry if a percentage of procurement is fixed for local procurement and not import. The knowledge of the certainty of the indigenous procurement may incentivise local industry to invest in the technology. It is also possible that indigenous industries may partner with foreign firms for joint manufacture or transfer of technology to manufacture the product locally. Once imbued with basic technology, the local industry can get involved in manufacturing spare parts and MRO activities to strengthen self-reliance. Further, the Indigenous industry may gradually become proficient enough to take up system or sub-system upgradations of the imported product, enhancing self-reliance in defence capability.

Importing defence equipment depends on the necessity and urgency of acquiring the desired military capability. Hence, curtailing a certain percentage of the imports and fixing the quantum of local procurement has to be done judiciously and progressively. It will be challenging to lay down a certain percentage for local development since the existing domestic capability has to be analysed from infrastructure, technical, and timeline angles. However, the impact of the decision to resort to local procurement and restrict the import volume on operational capability and combat preparedness has to be carefully considered. While self-reliance must be pursued to develop the indigenous industry, the armed forces must not be deprived of the best equipment, and they should not have to wait for the maturation of indigenous technology. Limiting state-of-the-art equipment will compel the use of outdated equipment, reducing the armed forces' war-fighting capability.

Some respondents felt that the lack of cutting-edge technology and manufacturing capabilities compared to developed countries would be the most limiting factor in relying on local industry. It must first be ensured that local firms are in a position to manufacture quality products. Limiting imports without ensuring the building of capability by local firms will prove to be suicidal. Giving freedom to defence PSUs in business conduct and making them more competitive instead of working under bureaucracy could be a good starting point. Few respondents felt that considering current industrial capability, imports may have to remain at 60 to 70%, which could be reduced aggressively, with meticulously planned induction of local weapon systems and equipment in the next 30 years, to 20 % or even less.

RQ 5(a). Does the general unsuitability of imported equipment for Indian warfare concepts, weather, and terrain conditions make developing indigenous equipment necessary?

The respondents believed that all imported equipment had to be adapted to suit Indian conditions so that they could integrate it into India's defence philosophy and perform optimally in Indian conditions. The military equipment available for import is developed and manufactured to meet the requirements of countries possessing advanced military-industrial complexes. All imported equipment is mostly developed for employment in cold areas and can handle topography and weather obtained in Europe. During the procurement process,

the technical specifications of the equipment to suit Indian conditions are invariably incorporated. This equipment must be modified suitably to operate in desert terrain with very high temperatures. Also, the high-altitude areas of the Himalayas demand specialised modifications to operate in the rarified atmosphere. These alterations are mostly built over the existing product. Hence, for the customisation of Indian conditions, additional costs are added to the overall procurement budget.

While pursuing indigenous development of equipment, the peculiar Indian conditions and war-fighting philosophy that dictate the technology and functional specifications of the products can be incorporated at the beginning of the development process. This would ensure value engineering to optimise the cost of the product from the conceptualisation stage itself. However, due to the unavailability of technology, such projects may take considerable time. Therefore, joint development of defence products with foreign technology may be the best solution.

Few respondents thought that defence products are robust and capable of operating in all types of weather and terrain. In all the wars, Indian defence forces fought with imported weapons and equipment, which performed well. Therefore, the imported equipment cannot be considered unsuitable for India's different weather and terrain conditions. Even for operating in high-altitude areas with challenging conditions, the equipment requires only minor add-ons and special maintenance procedures. The procurement process involves technically qualifying the product to meet stringent environmental factors. The foreign manufacturers keep all such requirements and are amenable to modifications to meet Indian conditions. To fight wars, Indian defence forces must have access to the best equipment available in the world, and the imported equipment can be tuned to be used in varied Indian terrain and climatic conditions, though the cost may be high.

RQ 6. Will the reorganization of indigenous Defence R&D efforts, including restructuring of DRDO, streamlining of R&D of defence public sector companies, and earmarking of specific R&D budgets for the private industry, lead to the achievement of self-reliance in defence technologies?

The respondents opined that Indian defence R&D is far below global standards. The defence R&D efforts in the country need to be optimised to ensure synergy of effort and reduce the high budgeting requirements of defence R&D along with the employment of skilled human capital for self-reliance in defence technologies. Integrating all stakeholders, such as the defence forces, industry, public and private sectors, defence R&D institutions, defence PSUs, and academia, is essential for developing indigenous defence technology.

Some respondents felt that mere allocation of funds to private industry would not result in breakthrough R&D since the private industry cannot take up defence R&D. Incorporation of academia, especially the top academic institutions of the country like IITs and IISc, in defence R&D efforts and encouraging careers in defence technology research through internships and research scholarships are imperative to invigorate the defence R&D. Seeking transfer of technology from foreign firms has not worked. The option is to go in for joint development. The private sector may be more suitable for joint R&D with foreign partners to speed up the flow of technology and self-reliance in defence technologies. However, suitable institutional oversight from the security point of view has to be ensured.

DRDO should spearhead defence R&D since it has an adequate infrastructure with well-established laboratories in all the required technological areas across the country. However, ensuring thorough control and monitoring of the defence R&D projects under DRDO at the highest level, including by the user services, and focussed efforts to hire the best brains in the field to create the required human talent pool is essential for result-oriented R&D. Some respondents felt that restructuring the DRDO is not required. The organisation's functioning requires improvement to make it more efficient and accountable. The acquisition and induction of the developed product into the defence forces, after validation of meeting the parameters and necessary certifications, will

only complete the loop for the achievement of self-reliance in defence technology.

RQ 7. Will simplifying procurement policies result in greater participation of indigenous industries in defence procurement since the long-drawn-out procurement processes disincentivize domestic industries from participating in defence procurement?

Most of the respondents were of the view that the procurement policies need further streamlining and simplification. The current procurement policies and procedures are intertwined in the voluminous Defence Acquisition Procedures 2020 document, which makes it difficult to comprehend. The initial policy section has been revamped and simplified with clear procurement categories such as 'Buy Indian', 'Buy Indian IDDM (Indigenously Designed, Developed and Manufactured) and 'Buy and Make Indian'. However, the procurement procedure sections have detailed processes to be followed by service headquarters for each type of procurement, which appear to be complex compliances and bureaucratic processes. These aspects need to be separated from the policy document and simplified. However, the online government marketplace GeM, used extensively in public procurement by the defence forces and other defence institutions with procedures such as reverse auction to pit the contractors against each other to bring down costs, is not mentioned. Simplification of procurement policies will result in greater participation of indigenous industries in defence procurement since the long-drawn-out complex procurement processes disincentivize domestic industries from participating in defence procurement. Too much simplification may lead to corruption and deterioration of the procurement process.

The concept of the lowest bidder and squeezing the commercial quotes in tenders through measures like reverse auction impact the quality of the products. Since the cost of products is lowered to win the contract, compromises in quality parameters invariably happen, leading to unsatisfied defence forces and imposition of penalties on the contractor. Though competition is required to ensure the best value for public money, superior technology and quality must be preferred in defence procurement. The complex system, wherein the user, the procurement agency, the quality assurance agency and the sanctioning authority are different, compounded by the necessity to follow rigid procedures and fear of vigilance agencies, makes timely procurement and incorporation of quality parameters challenging. Perhaps there is a need to create a team of well-qualified procurement staff with extended tenures for each stakeholder in defence procurement.

5. Discussion

The qualitative inputs from experts with diverse backgrounds, such as defence, industry, and think tanks, have helped synthesise coherent facets in achieving self-reliance in defence capabilities. It has given further insights into the subject but is generally in line with the literature review. There was a noticeable similarity in the responses across the spectrum. However, there were a few contrarian views on balancing and moderating the interpretations of all the specific questions addressed to the expert panel. The major factors that emerged from the qualitative study are given in succeeding paragraphs.

5.1. **Defence Self-reliance**: Defence capability building depends on factors such as geopolitical threats and national strategy.

5.1.1 **Geopolitical Threats**: There was an overall agreement about the need for India to be self-reliant in defence capability to safeguard its national interest due to the country's geopolitical threats. To face geopolitical threats, India must take measures to be self-reliant in defence capabilities. If a country depends on other nations for defence, it can get exploited in times of crisis with disastrous consequences. Foreign powers are guided by their interests and would not be reliable in times of need.

5.1.2. **Military Strategy**: Military strategy and doctrine are essential to guide the development of indigenous defence capabilities. The defence fund allocation would be based on the defence capability that needs to be built

based on the military strategy and doctrine of warfighting. The defence budget would remain dependent on overall fund availability and economic priorities; however, the country's economic progress makes it crucial to have a strong military.

5.2 **Allocation of Defence Budget:** The key element is allocating requisite funds to support the development of defence R&D and manufacturing infrastructure. Defence R&D has to be encouraged to develop niche defence technologies and products. Significantly, the private sector has to play a major role in boosting defence production capacity. However, the industry must have adequate supply orders to develop defence manufacturing capabilities.

5.2.1. **GDP**: Procuring the latest weapons and armament fund allocation of a high percentage of GDP is needed. Due to positive GDP trends, 3% of GDP for defence is a minimum requirement to face geopolitical risks or to induce new weapon systems. However, there were views that budget allocation should not be pegged or limited to a per cent of GDP but allocated as per armed forces' requirements.

5.2.2. **Revenue Expenditure**: Expenditure on salary and pension of personnel is a necessary commitment. However, there is a scope for innovative measures such as transferring civilian salaries and pensions to other ministries to reduce the revenue budget. To reduce salary bills, increasing the pensionable age of uniformed personnel to 60 years, like civilian counterparts, could be evaluated and implemented without compromising their morale and motivation. Highly experienced defence personnel could later be absorbed into other Govt/PSU organisations and paramilitary forces.

5.3 **Utilization of Defence Budget**: In the short term, pursuing self-reliance in defence equipment will be more costly than imports, considering the need for investment in building the requisite R&D and manufacturing infrastructure. However, in the long run, it would be better to develop in-house production capabilities since it would become cost-effective and lead to self-reliance in defence capabilities. There were contrarian views that, considering the volumes, it may be cheaper to import than to develop indigenous capabilities.

5.3.1. **Security Alignment Implications**: Security alignments seem essential to provide deterrence against superior adversaries and for supporting the development of defence capabilities. As such, relying on one side of the global power equation will not ensure security and survival. It would severely compromise India's strategic autonomy and could involve India in unnecessary conflicts. It would, therefore, be necessary for India to achieve self-reliance in critical technologies. Security alignments with big powers would essentially entail the achievement of military deterrence rather than significant military equipment or technology support.

5.3.2. **New Warfare Methods**: A new form of remote warfare using missiles and loitering ammunition drones has dawned. There is also extensive use of surveillance devices and AI to gather intelligence and improve targeting of the adversary using electronic warfare and UAVs. Most new technologies are commercial and developed by larger corporations, but they have found their way into defence as cheaper but effective solutions. New technology can enhance the existing capabilities over a short period over an inferior enemy but not for a longer duration on an equal or superior enemy.

5.4. **Defence Imports.**

5.4.1. **Suitability of Imported Defence Equipment**: All imported equipment is developed and manufactured by countries with advanced military-industrial capabilities to meet their requirements. Hence, they must be adapted to suit Indian conditions to integrate into India's defence philosophy and

perform optimally in Indian conditions. During the procurement process, the equipment's suitability to Indian conditions is invariably evaluated. These equipment are then modified to operate in deserts and high-altitude areas requiring specialised modifications. These alterations are mostly built over the existing product. Hence, for the customisation of Indian conditions, additional costs are added to the overall procurement budget.

5.4.2. **Restricting Imports to Promote Self-reliance**: Allocating a percentage of procurement for local procurement and not import would incentivise local industries to invest in the technology. It would also promote partnerships with foreign firms for joint manufacture or transfer of technology to manufacture the product locally. With basic technology prowess, the local industry can manufacture spare parts and set up MRO facilities, furthering self-reliance. The limit for import should be based on the capability of the indigenous industry and should be incremental. Limiting imports should not weaken defence preparedness.

5.5. **Revamping Defence R&D**: Defence R&D institutions, especially the DRDO, must be made more efficient and accountable. DRDO should be restructured and made stronger by inducting professional management. R&D efforts in the country must be optimized to ensure synergy of efforts and reduce high budgeting requirements of R&D as well as limited HR capital for carrying out such research. However, allocating funds alone will not guarantee self-reliance, accountability and time-bound projects are keys to success. The private sector and academia, which currently cannot support defence R&D, must be funded adequately.

5.6. **Streamlining Defence Procurement**: Procurement procedures require simplification and improvement. The current procurement policies and procedures are intertwined and complex, making them difficult to comprehend. Though policies have been revamped and simplified with clear procurement categories, the procurement procedures appear to be complex compliances with bureaucratic processes that must be followed. The primacy of technological edge over cost must be incorporated into the procurement process to acquire state-of-the-art or contemporary technologies. Quality and cost-based selection should be introduced across entire procurements. The recently introduced reverse auction requires review since it compromises on quality. Quality is a prerequisite for procurement, and cost is the basis.

5.7. **Conceptual Framework**: The qualitative research findings have reinforced the conceptual model's findings and development during the literature survey. The interplay between geopolitical threats, requisite defence funding, optimisation of defence budgets by long-term self-reliance development and forming security alliances, the impact of new warfare and defence imports and streamlining of defence R&D and procurement in achieving self-reliance in defence capability have been established. The refined conceptual framework is given below.

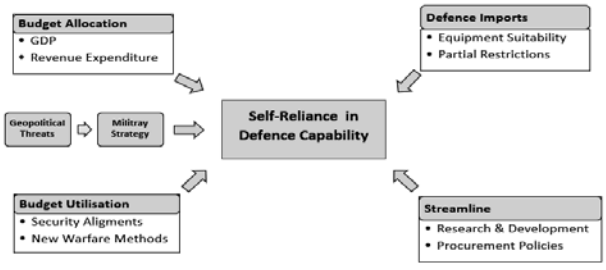

Figure 8: Revised Conceptual Model for Achievement of Defence Self-Reliance

Source: By Author

6. Conclusion.

The qualitative research revealed several factors that impact achievement and self-reliance in defence capability. The current geopolitical threats India faces due to its belligerent neighbours and resultant military strategy and warfighting doctrine make it

incumbent to strive for self-reliance. The allocation of the required defence budget is essential to build the indigenous defence capability. Building Indigenous defence capability may be prohibitive in the short term. However, it would be cost-effective in the long run and provide strategic autonomy. It is essential to optimise defence expenditure by reorienting revenue expenditure and entering into security alliances with bigger powers, though it may impact strategic autonomy. Emerging technology and new warfare methods would also impact defence expenditure. Pursuing dual-use technologies would help offset expenditure to a large extent. It is also necessary to look holistically at imported equipment and its suitability and cost impact for customisation to Indian conditions. Incentivisation of local industries by earmarking a certain percentage of imports for local procurement may also help to encourage self-reliance.

The points mentioned above provide insights into the steps needed to achieve self-reliance in defence capability in India. The geopolitical threats and regional ambitions make it critical for India to acquire the requisite military capability. The inputs of this study on the management of defence funding, development of technology and industry ecosystems and revamping of procurement procedures could be useful.

7. Limitations

The experts who participated in the study are senior serving and retired defence officers and industry leaders from public and private sectors, including MSME startups and think tanks. Considering the confidentiality of the subject, the respondents were requested to disclose only information in the public domain. Hence, there may be slight variances in the actual state of affairs. Also, due to the subject's sensitivity, there have been some reservations about expressing their views freely. The assurance of maintaining the anonymity of the respondents helped to seek their detailed responses.

8. Future Research

Though the responses have considerable congruence, a quantitative study involving a larger pool of respondents would help get greater insights into the peculiar nature of India's defence procurement. Despite possessing considerable capacity in civil manufacturing, nearly 70 per cent of defence requirements are imported. Based on such a study, giving valuable inputs to the authorities involved in procurement decision-making and the procurement process would be possible.

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