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Globalizing Resilience Against War & Deterrence In The Twenty-First Century

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Preface

This Position Paper entitled "Globalizing Resilience Against War & Deterrence In The Twenty First Century' is a sequel to the Working Paper No. 03/2022 entitled "Essentiality of Resilience for National Security in 21 st Century India. It was published by PPF Centre For National Security in November 2022. While the Working paper was Indocentric in nature, the present Position Paper dwells on the global aspects of Resilience as a conceptual framework to examine whether the theoretical and practical dimensions can be applied and what recommendations can be made available to serve as a deterrence against war. In essence, this study is also a pilot project to place the theoretical construct and the architecture of ***Resilience*** can provide answer to eradicate the possibility of war and conflict in the 21 st Century and hence rationalize how ***Resilience*** can in due course of time replace Deterrence through application of weapons of mass destruction.

Based on three independent research essays by three authors viz Gautam Sen, Ravinder Pal Singh and Harinder Singh the presentation threads the spirit and the Contents of the research essays in a seamless fashion. Thus, Chapter I, introduces the context of India and China as two old civilizational states which never had contiguous borders and whose frontiers were separated by another civilization called Tibet whose vast territory served s a natural buffer between them. The uninterrupted rule by Dalai Lamas during the century of humiliation following the Opium war in 1842, following the PLA's occupation of Tibet in 1951 in direct violation of the UN Charter, the Chinese troops after taking control of Tibet's capital and the surrounding areas, also began to appear on Indo-Tibetan borders for the first time in history. As China's economic and industrial growth has far outstripped India, their military budget gap has grown wider since 1990. China wants India to remain mindful of Chinese strategic claims and concerns and maintain its hegemony in Asia by combination of containment, claims, coercion and military-economic domination.

It is here that the Essentiality of National Security Resilience (NSR) as an applied theory and policies and implementation recognize limitations of countries to sustain protracted conflicts. NSR thus requires a nation to systematically convert its economic, industrial, financial and technological resources into military capabilities, within a defined period to effectively deal with threats that emerge. NSR capacity building aims at national processes that builds ability to convert assets and industry to sustain intensity of operations in long duration conflicts, at levels higher

than what threats the adversary can bring against it in the external and internal context. Thus NSR provides the ability for Sustainable Deterrent Capability Development.

The three abstracts deals successively Globalization of International Security & Strategic Autonomy, Developing Resilience for Comprehensive Strategic Power and Building Resilience Through Military Readiness. The position Paper goes on to suggest Future Studies on Resilience. In Chapter V, the position Paper deals with Policy Deficit and Recommendations and highlights the fault lines in India's Policy making, Policy Recommendations to achieve Resilience and Strategic Autonomy, Recommendations to achieve Resilience and Capacity Building and lastly the essentiality of the Creation of NSR Research and Applied Studies Institute.

Contents

CHAPTER 1

Introduction

The Context

China and India are two old civilizations with largest populations in the world, which never had contiguous borders. Their frontiers were separated by another civilization: Tibet, whose vast and difficult territory served as a natural buffer between them. In the 18th and 19th Centuries except for some military forays launched by Indians, the Nepalese and the Chinese, Tibetans were much the political masters of their own feudal state. Tibet had uninterrupted rule by Dalai Lamas during the century of humiliation following the Opium war in 1842. Following the PLA's occupation of Tibet in 1951 in direct violation of the UN Charter, the Chinese troops after taking control of Tibet's capital and the surrounding areas, also began to appear on Indo-Tibetan borders for the first time in history. Ever since Pakistan's attack on Jammu and Kashmir in 1947 and the subsequent wars, India's military challenges had been focused on its conflicts with Pakistan. However, a tectonic shift occurred on India's security landscape in 1962. But it was China's unprecedented economic and technological growth in the last three decades, which converted its military capabilities into a major strategic concern for India.[1]

From Beijing's perspective, despite their holding the world's largest populations, relationship between India and China is not one of equals. The Chinese perception is that India being a lesser country, they don't need to accommodate her concerns. India size is seen as demographically large but with weak mobilization of its population due to its economic weaknesses and factional electoral politics. The Chinese had concluded that India had little industrial capability, or economic and financial leverage to impose costs on China.

As China's economic and industrial growth has far outstripped India, their military budget gap has grown wider since 1990. China wants India to remain mindful of Chinese strategic claims and concerns and maintain its hegemony in Asia by combination of containment, claims, coercion and military-economic domination.

1. A recent poll conducted by Morning Consult on Indian security perceptions revealed that 44% Indians see China as India's "primary military threat." And only 13 % Indians now view Pakistan as a threat, despite fighting three wars and one limited conflict in Kargil. China is the patron that also uses Pakistan as proxy to contain the Indian military in South Asia, as well testing facilities for Pakistan it's nuclear weapon at Lop Nor in 1989, and grandfathered an insurgency in Kashmir since 1990. See Morning Consult provides global survey research tools, data services and news to organizations in business, marketing, economics, and politics. Based on interview of 1,000 Indians, including officials surveyed in Oct 2022, indicates a shift in Indian perspectives on its strategic challenges, due to growing threats from China.

Essentiality of National Security Resilience (NSR)

National security resilience is an applied theory. NSR policies and implementation recognize limitations of countries to sustain protracted conflicts. NSR requires a nation to systematically convert its economic, industrial, financial and technological resources into military capabilities, within a defined period to effectively deal with threats that emerge. National Security Resilience (NSR) capacity building aims at national processes that builds ability to convert assets and industry to sustain intensity of operations in long duration conflicts, at levels higher than what threats the adversary can bring against it in the external and internal context.

The primary significance of studies on NSR Capacity building is to develop process of convergence and conversion of economic and industrial capacities into military capabilities that are sustainable and restorable. The real danger in India is the rhetoric that gets built around nations' military capabilities which tends to create false optimism in electoral and public debates in democratic societies.[2] This requires to be tempered and balanced by scientific assessment in our legislative oversight processes.

Think Tanks in India have by tradition and organizational behaviour, over the past four-five decades provide security assessments from narrow or single discipline political or strategic analyses. Whereas, national security resilience requires interpretation of a nation's economic, industrial and technological depth to convert such assets to defence policy applications. At best, capability assessments are made on GDP allocations made to the national defence sector and no more.[3] NSR theory aims to identify factors of military effectiveness which are broader than defence budget allocations for military weapons and manpower. There is clear evidence of absence of studies on how national security resilience can be developed by building comprehensive strategic capacities in nation's economic and financial resilience; advanced technology export competitiveness; and industrial conversion to meet surge in military demands in anticipation of long duration conflicts.[4] Also absent in our security studies research literature is assessment of processes for implementation of policies and alternatives. How should the NSR processes be designed and assessed. Comprehensive assessments for policy alternatives and decision-making require multi-disciplinary examinations.

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2. This flawed assessments based false optimism are not unique to democracies, considering the misreading of realities of American experiences in the operations of Bay of Pigs, Vietnam or in Afghanistan from 2003 to 2020. For that matter false optimism of Putin and his inner circle of advisors on Ukrainian resilience to take on Russian onslaught in February 2022.

3 Even as several studies have shown that military success rates are more influenced by factors such as Net GDP and Per capita income that shape military effectiveness, as opposed to assumptions of military capabilities are dependent on a country's defence budgets. To that extent, military effectiveness correlates with economic development, systems, skills and national per capita income are better indicators of military outcomes. (Michael Beckley, Military Effectiveness and Economic Development; power of Nations, International Security)

4 In the recent past, the unchallenged American power backed up the world's largest GDP and the largest defence budget, pulled out of Vietnam and Afghanistan. That means there are other factors at play, which influence military outcomes, other than power asymmetry identified by national defence budgets. One factor was common to both Vietnam and Afghanistan outcomes, the American expeditionary forces could not politically endure protracted conflicts. One has to question whether India have capacities to convert its economic, industrial resources to sustain protracted conflicts, which could get extended over long duration, as opposed to China's ability to generate military stocks for protracted conflicts? Analysts need to measure impact of Net GDP and per capita incomes, which has had historical correlation to assess a country's military effectiveness. Qing Empire had the largest GDP in the 19th Century, yet it lost to smaller European states. America, with world's most powerful military and the largest defence budget had to withdraw from wars in Vietnam and Afghanistan due to low political resilience. Unless multi-disciplinary studies are conducted in India to analyse barriers, limitations, agencies and processes for implementation, it is unlikely that capacity building optionsfor NSR can be scientifically assessed by defence analysts trained only in strategic or political studies.

NSR For Sustainable Deterrent Capability Development

Despite its large size, India will remain dependent on some power or the others for its own security. Consequently, India's ability to contribute towards global stability and international security will remain stymied. Unless a country is able to develop sustainable NSR capabilities, it will be unable to independently deter or overcome security threats that can be operationalized for indefinite periods of time. It is in this aspect of deterrence strategy, below the nuclear threshold, that Indian needs to build and implement effective NSR capacity-building strategies that can be sustained over the long term.

The NSR concept identifies seven initiatives that require building and sustaining a nation's strategic resilience by developing its national resources comprehensively. These are namely: International Security and Mutual Dependency; Comprehensive Strategic Power (CSP); Operational, Logistical and Infrastructural Readiness for Strategic Resilience; Economic, financial and trade resilience; Industrial conversion and competitiveness in manufacturing sector; Advanced technology export competitiveness; and last but not the least, essentiality of social stability and public confidence in social contract between the state and society. This essential work on NSR introduces three stand-alone chapters. These aim to approach the NSR challenges from their specific sub-disciplinary perspectives of the three contributors.

Below a brief abstract of the three sub-disciplinary arguments have been included in this introductory chapter. The lead chapter professes that India needs to build a robust inter-disciplinary mechanism to put in place specialised focus on building of a resilient state featuring secular democratic values, trust in institutions and all-inclusive and sustainable development, all of which lies at the heart of a resilient state. The next chapter focuses on India's options, processes and methodologies to develop its Comprehensive Strategic Power (CSP) and examines value addition to its security resilience by overcoming limitations in socio-economic and manufacturing sectors that retard the overall development of CSP in the domestic context. And the last chapter delves on the essentiality of building state resilience by redefining the constructs of military readiness to preserve and uphold sovereignty and territorial integrity including maritime concerns in the Indian context.

Abstract #1: Globalization of International Security & Strategic Autonomy

Super powers and major powers around the world relied heavily in the cold war period on technology that provided deterrence and hence alliance produced effective countervailing power to pit one set of political ideology against another – open market based capitalism versus state capitalism. With the introduction of the nuclear weapons, the Marxist Leninist theory propounded during the Stalin period that "*war is inevitable between the capitalist and proletariat, in theory possible, and in practice winnable, by the Communist regime because of superior weapons of mass destruction, superior motivation and superior trained manpower of their standing armies".*

As a result, much of the arms race between the East and the West, the mass production of arms and positioning of military manpower by the former Soviet Union against US and her NATO allies was based

on the theory of winning a nuclear war. However, the inevitability of a no war situation in the post Stalin era made Nikita Khrushchev to re-rationalise that "w*ar is still inevitable, in theory possible, but in practise might not be winnable"*. This was the first stage of revisionism that was unfolding in the Eastern Europe regime led by the former Soviet Union. It was Mikhail Gorbechev who realised that Soviet Union had to accept that *"war was neither inevitable, nor in theory possible, nor in practice winnable".*

Thus up to the collapse of the Soviet Union in 1991, nuclear proliferation and nuclearization occurred in and beyond the original five countries right up to North Korea and with many other nation states aspiring to be nuclear nation state and the attempt continues even today. Bi-polarity has definitely given way to multi-polarity and nation states small or large have started defining their national security perspectives based on their own national interests. By the beginning of the twenty first century, the world had transformed into an "age of uncertainty and a world in transition". It is in the recognition of this new era that the nation states found it necessary to redefine their national security perspectives and objectives. There were no definitive answers as each nation states started reeling under the weights of internal security presuppositions and external threat perceptions whether from the immediate neighbours or otherwise. While the threat of a nuclear holocaust during the Cold War prevented an all-out war which was avoided, that in the 21st century it became evident that nation states of all dimensions must find a way to avoid war at all costs.

To explore long term threats to India's strategic autonomy has become very important for India today. It entails a better understanding of the world and the need to institutionalize a mechanism to build resilience in the 21st Century India at four levels. First, it requires to create sound decision making among policy makers and a rule based participation by institutions and organizations in Indian Government. Second, the refinement and alignment of processes undertaken to arrive at the decision making by a resilient state. Third, to identify whether the processes envisioned by the state are through the conceptual lens of a developmental perspective alone, or enhancement of sheer military capabilities, or both. And fourth, the mechanism through which the private and corporate sector, as well as the NGOs and others, can participate in resilience centric decision making in an even playing ground.

India needs a mechanism to put in place a specialized focus on "resilience". For this, an assessment of a resilient society featuring democracy, trust in institutions, and sustainable development lies at the heart of a resilient state. This chapter has attempted to analyse the politics of strategic affairs in the framework of temporal history. The aim has been to place before the reader the argument that the 21st Century is turning itself into an uncertain period. Thus, nation state actors small or large have to realise the necessity to quantify their approach to increase the resilience of their individual nation states. This can be achieved through the development in the fields of economy, GDP, GNP, employment, infrastructure, health security, education and energy and environmental security. The subject is deliberated under three heads: an historical overview of strategic challenges of the 20th Century; the global security challenges facing India in the 21st Century great power competition; and, lastly, a set of resultant recommendations which prescribe as to how to achieve "strategic autonomy" for which India needs to enhance its strategic competitiveness vis-à-vis China and other authoritarian powers acting as India's adversaries.

Abstract #2: Developing Resilience for Comprehensive Strategic Power

The study on India's options, processes and methods to develop Comprehensive Strategic Power (CSP) is an under-investigated field of inquiry. The next chapter examines how to value add to India security resilience by overcoming limitations in five socio-economic and manufacturing sectors that significantly retard its CSP. These five sectors are identified on the basis of three-point criteria: its impact across a very large scale and developmental space; the scope and potential for high economic growth and efficiencies; and opportunities for promoting and supporting technological innovation. And these five sectors are namely: poverty eradication; enhancing female labour force participation rates; universalization of secondary education; generating per capita energy consumption to the levels of middle-income country; and building advanced technology export competitiveness for developed countries. Growth in these five sectors will significantly enhance a country's multiplier impact on its economy and have potential for technology investments and innovation in its defence sector. An appropriate and well administered framework of rule of law and regulations will be necessary to achieve this purpose.

The discussions on CSP raises the question whether a country can have economic resilience without eradicating poverty and breaking free of its low income trap. It suggests studies and trials to test alternative methods of poverty eradication for the country, and break out of its low income trap.[5] Even though our political leaders do not to accept the scale of poverty in India, but need to be reminded *that the rampant hunger and pursuit of self-sufficiency in armaments (Atmanirbhar campaign) are logical inconsistencies*. Unless the country launches a nation-wide R&D campaign to increase its per capita farm output and as an essential component of food security, India cannot bridge the power gap with its security threats, when two thirds of its population (950 mn) are beneficiaries of National Food Security legislations?[6] Technology innovation led growth in India's farm sector, by decreasing poverty will increase domestic consumption, generate demands and investments in industrial manufacturing sectors, as well increase the scale of its retail market, which provides a state the financial revenue for its security sector.

Next, Indian leadership also needs to acknowledge that to be able to deliver its promised potential in terms of CSP, it must focus on enhanced and effective productivity of its human capital. When compared with other post-colonial countries over the same period, India's performance has been a bit patchy and lacklustre. A security resilient country can only add productivity to its human capital through universal secondary education with a significant scale of technical knowledge and knowhow. This educational foundation is an essential building block for creating an engineering economy and industry that provides indigenous industry with technological innovation. Unless a high end engineering capacity is developed in a country's overall manufacturing sector across the country, it will not be to build value-added technical equipment and reduce reliance on imported weapons and equipment. It is the engineering potential in a country that enables conversion of indigenous engineering industry for production of military equipment to meet surge in demands,

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5 Even though India has third largest defence budget and fifth largest GDP, but 142 rank in per capita income, restrains its military acquisitions.

6 Reetika Khera, "Expnd the food safety net without any more delay" The Hindu, 10. Dec. 2022 P.6

during external military threats. Therefore, it is essential as to what role the Government could play environment and laws, holding hands where necessary to enable concerned engineering industries to be globally competitive.

It will be Necessary to Diversify energy production and import sources, including hydropower, nuclear power, coal and oil based energy. India buys oil from Asia, the Middle East, Russia, America, and other parts of the world. How easy or difficult it would be for China to disrupt India's energy supplies? By creating clusters of advanced technology R&D for export competitiveness will boost innovation to broaden its domestic technology base, improve quality control standards in its industry, and spin-offs for its military products as well.

Abstract #3: Building Resilience Through Military Readiness

This part delves into the essentiality of building state resilience by redefining the construct of military readiness and its understanding in the Indian context. Military readiness is one of the least studied and understood concepts in the field of strategic studies and, in the absence of any significant theoretical constructs, Indian policymakers and practitioners tend to define or interpret military readiness in several ways – either too narrow or too broad. A traditional conception of military readiness is to look at it as a subset of military capability. For instance, the United States Department of Defence (DoD) defines military capability as four distinct pillars: force structures, military modernisation, combat readiness and operational sustainability. Both readiness and sustainability together explain the ability of US armed forces to deliver combat potential in crises situations. In the Indian context, the national security concerns are somewhat different; it's about securing our unresolved territorial borders and maritime interests in a difficult neighbourhood. An analytical framework to assess India's military readiness needs and plausible levels against a well-defined criterion is, therefore, an important policy imperative to build a resilient state.

Given the nature of national security threats and challenges, some of which are not clearly discernible, there is a need to build sufficient theoretical rigour and learning among India's defence policy makers and practitioners in order to contextualise and address the problem of military readiness. Three policy aspects are pertinent.

Firstly, there is a need for a pragmatic shift in our thinking and approach towards defence preparedness. India's long-standing notion of defence preparedness needs to give way to an idea of military readiness, as articulated in modern militaries, which as a construct is quite distinct from military preparedness. The former exemplifies the need of being "ready and relevant in measurable terms" at all times to deal with operational contingencies as and when they occur, while the latter simply highlights the necessity of "achieving" military preparedness levels to meet security threats, without any precision or clarity. Secondly, India's readiness needs are to be seen at two levels: structural and/or operational. Simply put, our readiness needs along the western borders are primarily operational in nature, while those in the north along the unresolved borders with China and maritime context are structural in scope. The policy makers' challenge lies in balancing these structural and operational dimensions of readiness in the armed forces. And thirdly, there is a need to view India's concerns of combat readiness through overlapping prisms of national security, foreign and defence

policy, doctrines and strategies, funding and technology, joint structures and capability, training, and culture. India's reliance on defence funding and acquisitions alone inhibits us from addressing these readiness concerns objectively. Furthermore, the process of assessing and reporting the levels of military readiness in the Indian armed forces is still in its infancy, due to lack of a publicly articulated national security strategy, readiness metrics and more importantly, strong institutional oversight.

The study strongly emphasizes that men, machines and material (3Ms) backed by money determine a state's capacity to leverage its hard power to fulfil its security objectives. Any deficiency in any of these constituents can create a structural imbalance, impacting the development of military capabilities and, in turn, the desired levels of military readiness for peace and war. India's military experience is replete with instances of unreadiness for war, when either a single or combination of these elements have had an impact on its military outcomes. India's therefore policy challenge lies in harmonizing these important constituents, both at a doctrinal and structural level, to meet the readiness needs of the three services.

For the foreseeable future, the bottom line remains that India's long-term military readiness needs vis-à-vis China need to be seen more in structural terms, rather than operational alone. Pakistan remains important as turbulent neighbour, but not as much to dilute our policy choices and options as against China.

Future Studies on Resilience

India lacks an institutionalized capacity that has oversight authority on the executive coordination of harnessing of nation-wide resources and capacity-building in various socio-economic and industrial sectors to converge on to our national security requirements. This gap is strongly felt by the practitioners and reflected also in the absence of an articulated grand strategy or a national security strategy. National Security management needs clarity of vision and any diffusion does not help.

An executive authority is required to review mobilization of civilian sectors for military applications such as: communications, transportation (air, shipping and surface), medical, food stocks, private sector industrial conversion for ammunition and major systems, banking and finance, power supplies, civil supplies, international trade and energy.

For lawmakers, policymakers and practitioners, the key question here is how should institutionalization of NSR and the capacity-building processes be initiated and implemented. The NSR Strategy would require a specialized agency for creation of resilience of the nation through the implementation of the NSR Projects. A creative agency to test and try alternatives to increase per capita farm output for food security, eradicating poverty, increase domestic consumption, generate demands in industrial manufacturing sectors, increase the scale of its retail market and service sectors, that will provide India with financial resilience for its security sector reforms.

Till India is able to achieve that state of national security resilience, Indian leaders can only provide mitigative encouragement to their military leaders, to be ready and prepare themselves for threats.

When compared with other post-colonial countries in the same period, India's performance with regard to secondary education has been patchy, lacklustre, and bereft of adequate finance. And without universalization of secondary education that builds large scale of technical knowledge and human capital, our ability to sustain security sector resiliency will remain limited. Without such essential building blocks that are required to create an engineering economy, the indigenous industry has little chances to become competitive. As the pace and costs of technological changes gets higher, without developing a high-end engineering resource in a country's manufacturing sector it might not be possible to sustain building of value-added technical equipment to reduce India's dependence on imported weapons and equipment. The broader engineering potential of a state enables conversion of indigenous engineering industry and innovation to meet surge in demands for production of military equipment and other wherewithal for meeting threats over a longer period of time.

The NSR Agency proposed as and when established would be expected to issue white papers on coordination processes between different ministries, to develop alternatives for the resilience subdisciplines. Here, the role of legislative oversight on building coherent long-term plans and capacities for consistency in readiness and resilience would be important. For instance, Lok Sabha Standing Committee on Defence could invest in accessing appropriate research capacities to examine issues of military resilience and readiness with far greater purpose and longer time horizons. In similar way, several modern democracies use legislative oversight processes, which may require confidentiality obligations. A country's national security capabilities may be called upon to deter or overcome military security threats that could be operationalized for even indefinite periods of time. As peace and stability requires mobilization-ready military, a country's military resilience requires industrial, financial and economic capacities to be built for conversion to sustain a nation's military potential.

In summary, it is argued that unless a nation formulates a grand strategy and in its sincere pursuit of that strategy designs, develops, implements effective human capital competitiveness, socio-economic and industrial capacity-building strategies for financial and technological resources, without which, it is uncertain if a nation can overcome limitations that impair its national security resilience sustainable over a period of time and without such attributes, a country cannot meaningfully contribute towards global stability and international security.

In the following pages, three contributing authors place their views. Gautam Sen writes on "Building Resilience For India's National Security: World in Transition In The 21 st Century", Ravinder Pal Singh writes on "National Security Resilience (NSR) Capacity Building:2023-2047" and in concluding presentation Harinder Singh delves into "Building National Security Resilience (NSR)Through Military Readiness".

CHAPTER II

Building Resilience For India's National Security: For World in Transition In The 21st Century

Gautam Sen

"A resilient society featuring democracy, trust in institutions, and sustainable development lies at the heart of a resilient state."

Global Strategy for the European Union's Foreign and Security Policy, 2016: 24

To explore the long term threats to India's strategic autonomy[7] has become very important for her today. It entails the understanding and institutionalize mechanism to build Resilience in the 21st Century India and also create decision making and a rule based participation by institutions and organizations in Indian Government with those from the Private and Corporate sector as well as the NGOs in an even playing ground. It is needless to repeat that in order to build a specialized focus on Resilience and an assessment[8] of the same in the Indian context may or would require institutionalized network of multi-disciplinary skills. In the limited time we decided to share the burden of ploughing through the strategic conundrum by uncovering the mosaic of "World in Transition" [9] In the first part, I will first give an overview as to what were the Security Challenges that were faced globally between 1945 and 2000 and identify how the world remained strictly bipolar till the demise of the former Soviet Union till 1991. More painful was the period between 1992 and 2000. It made the monopoly of nuclear weapons which had made the construct of superpower into a binary platform crumbled and has made Cyber space to became dominated by information technology[10]. The domination of Information Technology can be seen more clearly in the period from 2001 to the present 2022. Therefore, the world or the global order between 1945 and 2000 can be dubbed as the "World in Transition" and that from 2001 onwards till date ~~can be~~ labelled as the "Age of Uncertainty".

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7 Muraviev, A.D., Ahlawat, D. & Hughes, L. India's security dilemma: engaging big powers while retaining strategic autonomy. Int Polit 59, 1119–1138 (2022). https://doi.org/10.1057/s41311-021-00350-z and Hitendra Boradey, India Strategic autonomy through non-alignment policy, https://thekootneeti.in/2022/03/10/india-strategic-autonomy-through-non-alignment-policy/ and Monish Tourangbam "Finding Strategic Autonomy in the Quad: India's Trial by Fire" also see Appenxix A to this footnote

8 For an in depth discussion see Nation State National Security and Globalisation https://www.tandfonline.com/doi/full/10.1080/21693293.2014.914771?scroll=top&needAccess=true&role=tab.

9 This aspect is discussed in the main text of this presentation as "Historical Overview of Strategic Challenges of the 20 th Century and Global Security Challenges Facing India in the 21 st Century pp 7-10

10 For the latest See P K Mallick, Information, Cyber and Space Domain and Its Application in Future Land warfare, K W Publishers, New Delhi, March 2023.

In the deliberation of this paper, the following issues will be covered:

1. **Historical Overview of Strategic Challenges of the 20th Century**
2. **Global Security Challenges facing India in the 21st Century**
3. **Great Power Competition**
4. **Recommendations**
5. **Conclusion**
6. **Historical Overview of the Strategic Challenges in the 20th Century**
7. Nuclear weapons [11] had achieved the reputation of offering deterrence for implementing strategy in warfare. Technology and foreign policy were intricately interrelated. Herman Khan had written the "Deadly Logic" and Kissinger had perpetuated "Nuclear Weapons and Foreign Policy". Mac Arthur was the role model for every soldier in the western world while Mao and Ho Chi Minh in developing societies of South and South East Asia. There were no takers of Lenin or Che Guevara. War was divided in two levels – conventional and nuclear. Strategic Challenges have gone through three distinct phases between 1945 and 2000.
8. ***WII 1939 – 1945***
9. The impact of Technology [12] in conducting warfare was fully evident and expanded dramatically for conduct of warfare in Air, Land, Sea and Under Water. Technology decided Policy Making unleashing the power of the Atom. Possible use of weapon of mass destruction became a reality and the Strategic Challenge was to win the war.

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11 For over 50 years, but especially since the end of the cold war, the United States and the Russian Federation (formerly the Soviet Union) have engaged in a series of bilateral arms control measures that have drastically reduced their strategic nuclear arsenals from a peak of around 60,000. The most recent of those measures, the New START Treaty, limits the number of deployed strategic nuclear weapons to 1,550 per State. New START is scheduled to expire on 5 February 2021; should it expire without a successor or not be extended, it will be the first time that the strategic arsenals of the United States and the Russian Federation have not been constrained since the 1970s.*

* The New START Treaty entered into effect on 5 February 2011 for a period of 10 years. It can be extended for up to five years, unless it is replaced earlier by another agreement. Source: Federation of American Scientists. Although nuclear weapons have only been used twice in warfare—in the bombings of Hiroshima and Nagasaki in 1945—about 13,400 reportedly remain in our world today and there have been over 2,000 nuclear tests conducted to date. Disarmament is the best protection against such dangers, but achieving this goal has been a tremendously difficult challenge. See https://www.un.org/disarmament/wmd/nuclear/

12 In the long-term, nuclear weapons produce ionizing radiation, which kills or sickens those exposed, contaminates the environment, and has long-term health consequences, including cancer and genetic damage. Their widespread use in atmospheric testing has caused grave long-term consequences. See What happens if nuclear weapons are used? – ICAN https://www.icanw.org catastrophic_harmC:\Users\PPF\Downloads\What happens if nuclear weapons are used? – ICAN https:\www.icanw.org catastrophic_harm

10. ***COLD WAR 1945 – 1991***

11. Ideology takes the centre stage with Liberal Democratic form of Governance operate with Market Forces and compete with Centrally Planned Economies of Socialist Countries to establish Bi-polarity. Strategic analysis was based on privilege information leading to government monopoly in both the systems. Large reduction of numerical manpower strength of the Western Armies with focus on high end technologies to incorporate nuclear weapons "sited for all round defence" through military alliance politics of NATO to protect Western Europe by creating a ring fence around the southern tier of the Soviet Union having Muslim population through SEATO, CENTO. EAST AND WEST represented by the US and the Soviet Union prepared for three and half wars at the height of Cold War. SALT-I, 1991, SALT-II, 1993,,CTBT,1996, PTBT(Partial Test Ban Treaty, 1963), NPT July 1968, entered into force Mar 1970, Review and Extension Conference was carried out in1995 and was decided that Treaty should remain in force indefinitely. ABM treaty was concluded on May 1972, Treaty on the Reduction and Limitation of Strategic Offensive Arms (SART-I, 1991), START-II was initiated in 1993 but did not come into force, Similarly Treaty on Conventional Armed Forces in Europe(CFE, 1990) was also carried out. Soviet Revisionism during the Cold War period – Stalin to Khrushchev to Gorbachev ultimately to the balkanization of the Soviet Union in 1991. Proliferation of nuclear technology and nuclear weapons spread in other nation states and the world became multipolar.

12. Challenges during Cold War[13] was to (1) Avoid nuclear holocaust (2) Defining periphery and limit the periphery of Deterrence which explains the interplay between Non-proliferation and proliferation doctrine.

POST COLD WAR 1991 – 2000

What were the conceptual issues? The question was to ask if a new world order emerging.[14] Did it indicate the end of the existing agenda because of the end of an perceived permanent enemy and the loss of Bipolarity due to the Soviet balkanization. Would the world in transition lead to the demise of the Nation State as a unit of International Relations and Politics? Will Emerging European Integration lead to the architecture of a Super State? What will be the fate of Political, Economic, Fiscal, Exchange Rate Mechanism, Migration, and Environment. Does Europe replaces former Eastern Bloc? What was Europe's world vision? In the so called New World Order will it witness the:

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13 See "5 facts you need to understand the new global order" https://www.weforum.org/agenda/2018/01/five-facts-you-need-to-understand-the-new-global-order/

14 Frederick Kempe, Op-ed: A new world order is emerging — and the world is not ready for it. APR 3 2022,https://www.cnbc.com/2022/04/03/.Also seeMuzaffer Ercan Yilmaz, The New World Order": An Outline of the Post-Cold War Era, Alternatives Vol 7 No 4 Winter 2008, https://dergipark.org.tr/tr/download/article-file/19517. Also see Colin I. Bradford, Perspectives on the future of the global order, 4 May 2022, https://www.brookings.edu/blog/up-front/2022/05/04/perspectives-on-the-future-of-the-global-order/

a. Demise of the Collective leadership

b. Demise of State Capitalism

c. Technology and Development

d. Technology and Ethics

e. Demise of the welfare state

f. Rise of the individual

g. Evolution of International Political Economy –Regime theory, trans-nationalism

h. Nation State, Society, Identity

i. Technology and trans-nationalism

j. Governance

- People including Human Rights
- Government including Bureaucracy
- Technology including environment

In Management, what will happen to

- International Organisations
- Resource Distribution
- Ethics and Values

In Strategic Considerations, what will be the

- Concept of Power
- Concept of the Use Of Force
- Waging of Humanitarian Wars
- Demise of Classic deterrence
- Cost effective paradigm

Will the new Paradigm of Integration work through

- Exchange rate mechanism
- Guarding Intellectual Property Rights

- Ensuring Energy Security

Will the International System after Soviet Demise do

- Damage assessment
- Shift from Strategic nuclear to nonstrategic dimension Ecology environment, pollution, energy and the Rights of the Unborn
- Assess the future of CIS and China
- Future of Russia and the role of Europe
- Future of Asia and the role of China
- How Clash of Civilizations at Macro level will act with Bias.
- How at Micro levels clash of/conflict between ideologies to be replaced by conflict between religions and differing ethnic groups
- How Emerging China as a major power operate

Global Security Challenges facing India in the 21st Century

It becomes abundantly clear in 2022, that the notion that Russia and China would integrate into the liberal international order is out of even imagination. It is rather the other way round in the international arena where we are witnessing the advent of a new era of intensified great power competition. This great power competition is different than that which existed during the Cold War and up to the beginning of the 21st century and the collapse of the Soviet Union and emergence of China as an economic and military power.

While the US has maintained its leadership as a superpower with her European allies and Japan, India has been emerging a[15]s an important player in the global order with the fastest growing economy, showing potential to be self-reliant with capacity building for resilience also in non-military arena like containing the COVID pandemic,

Two Scenarios

If we measure today's security environment by what was expected a decade or so ago, it is clear that the United States is facing near worst-case scenarios on both great power competition and transnational threats. This is compounded, moreover, by a negative synergy between them that makes each even more dangerous and difficult to deal with.

15 See an excellent perspective on the HRD aspect for India at https://www.researchgate.net/publication/284736175_Challenges_facing_India_in_the_21st_century_An_HRD_perspective/citation/download. Also see Siwach, R.S. "India's Security in the 21st Century: Challenges, Management and Futuristic Directions." *Indian Journal of Asian Affairs* 16, no. 1/2 (2003): 145–58. Also see India's Security in the 21st Century: Challenges, Management and Futuristic Directions R.S. Siwach http://www.jstor.org/stable/41960508.

Over the past decade, China and many other authoritarian states have become both more repressive at home and more assertive abroad. Unlike in the 1990s and early 2000s, they are willing to use hard power to push back not only against the United States but other adversarial states to them like India and the lesser powers in South East Asia by making South China Sea as pivot for their actions militarily and diplomatically to achieve their objectives. Against India, China has almost stated as categorically as possible when dealing with the international border issue that "what is ours (China's) is ours and what is yours(India) is negotiable" Fearful that liberal democracy and the US led international order and supported by her NATO partners, will undermine their regimes, they are systematically seeking to create an international order safe for autocracy, which includes shaping and interfering in the politics and society of democracies. Both China and Russia have started wooing every "Illiberal" democracies around India and the United states in specific case is also no exception. China's strategic rationale of countries through which the Chinese Belt and Route is being fashioned to basically to extend her hold by sheer financial means and making them enter the debt trap.

Meanwhile, COVID-19,[16]which is by no means the most lethal form of pandemic we could face in our lifetimes, has claimed over two and a half million lives, including those of over 500,000 Americans and equal numbers in India, and cost more than $26 billion in the US and a similar amount to India if we take into account the purchase power parity between the dollar and the rupee. It has simultaneously upended the lives of billions of people around the world and broiled the domestic politics and economies of key countries in ways that will have repercussions for years to come.

Indeed, the COVID-19 crisis illustrates the negative synergy between great power competition and transnational threats—one that fundamentally changes both for the worse. The autocratic nature of the Chinese regime and its paranoia about its hold on power and standing in the world made it less likely to cooperate with the international community. It covered up the virus in the crucial early months and continues to withhold vital information from the World Health Organization. The current pandemic highlights the way in which China has increased its influence in international institutions in ways that damage the interests of other nations. And, independently of Chinese behaviour, the more nationalistic outlook of governments around the world has undermined the type of international cooperation we are used to witnessing in a crisis and reinforced the sense that every nation is fending for itself.

The pandemic will have long-term strategic consequences for every nation state globally and will leave an undeniable impact on the global international order. While the United States saw a 3.5% economic decline in 2020 and other democracies saw even more staggering losses, China's economy grew by 2.3%. By one measure, China has gained five years on the United States and will now become the world's largest economy by 2027 rather than 2032. Early talk of China's "Chernobyl moment" has long passed, and it is now clear that the Chinese government believes it has emerged stronger from a global crisis for the second time in fifteen years (the first occasion being in the aftermath of the financial crisis). China took this opportunity to dramatically increase its geopolitical assertiveness: it cracked down on Hong Kong; it clashed with India;

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[16] WHO reported that On 30 January 2020 COVID-19 was declared a Public Health Emergency of International Concern (PHEIC) with an official death toll of 171. By 31 December 2020, this figure stood at 1 813/ 188. Yet preliminary estimates suggest the total number of global deaths attributable to the COVID-19 pandemic in 2020 is at least 3 million, representing 1.2 million more deaths than officially reported. https://www.who.int/data/stories/the-true-death-toll-of-covid-19-estimating-global-excess-mortality

and it has embarked on an ambitious diplomatic effort to increase its influence overseas through the selective distribution of medical supplies and vaccines. It is also likely that the long-term effects of the pandemic will be to plunge parts of the developing world into crisis and place severe downward pressure on defense budgets not only that of the U.S. but her allied countries, including in Europe and significantly that of India too which has been dubbed as one of the top largest growing economy in the world The pandemic reveals that issues we traditionally think of as fostering cooperation are, in our world, more likely to take on competitive characteristics. To take another example, the race to mitigate climate change may also become its own area of competition between the United States and China on one hand and now specifically with India too. While the United States and Europe will be competing with China for a technological edge on innovations to produce a carbon-neutral economy and for access to raw materials (magnets, batteries, high-performance ceramics, and LEDs, among others) India will have to compete equally on the key domain as world's manufacturing hub. In some of these areas, the United States and Europe are at risk of dependence on China. In case of India it is alarming when one takes into account the trade deficit between the two is in excess of a $100 billion and rising in favour of China. Hence it is critical to ensure that the free world become more self-reliant when it comes to the decades-long effort to develop clean technology.

It is commonplace for experts to talk about strategy prioritizing traditional threats or transnational threats. What we need today, however, is a comprehensive strategy that not only tackles both, but recognizes the linkages between the two, and the way in which these threats undermine our interests and the international order. The crises of 2020 demonstrate that every nation state large or small, major or lesser power be prepared for a world with more severe and frequent global shocks, against a backdrop of emboldened adversaries and limited cooperation between the major powers. This certainly means competing strategically with China as well as Russia more so with the ongoing situation emerging from the Ukraine crisis. It also means that India currently as the most populous country in in the world must take concrete steps at strategic levels to arrest the growing asymmetry with China, dependence on Russia for military products and steps to limit the fallout from the pandemic in the free world.. As the United States and its allies must prepare to deliver public goods, like global public health, in this environment, which will likely mean building new coalitions of the like-minded, so is the role of India important to assist the illiberal states and take them away from the economic dependence on China.

Contending Revisionist Powers

While it is necessary to contemplate a world in which the United States and its allies compete with China and other autocratic regimes beneath the threshold of war, we cannot lose sight of the professed traditional mission of post-war U.S. strategy: to deter aggression by adversaries. This, too, has become more complicated as great power rivalry has intensified and the entry of emerging democratic powers like India coming up in the centre stage of world events, its growing influence on world politics and a leading actor in international political economy.

We often think of revisionist powers as countries hell-bent on global domination, like Nazi Germany or the Soviet Union. But revisionism rarely manifests itself with all-out war. Revisionist states traditionally

go after the non-vital interests of their great-power rivals, because this generally doesn't provoke the type of retaliatory strike that attacking a vital interest would. Threatening non-vital interests—for example, by attacking a non-ally—leaves the status quo power torn over how to respond and whether retaliation is worth it.

Of course, the term "non-vital interest" is somewhat misleading. It only holds true when viewed narrowly and in isolation. While annexation and unprovoked invasion like the case of Ukraine clearly constitute a breach of the peace and threaten vital interests of nation states, seizing small rocks or strips of territory poses a more ambiguous threat. Such moves appear to be of limited strategic importance, until, in the aggregate, they acquire much greater value. At the outset, the fact that no treaty has been breached and the territory seems to be of limited importance is highly significant to the dynamics and psychology of any given crisis. It is precisely the small strategic value of the contested territory that causes the dominant power to refrain from going to war over it at an extraordinary cost, one that would be vastly and inversely proportionate to the value the dominant power places on the disputed territory.

This is not a new problem. It is textbook revisionism, and it poses the most complex problem a major power can be confronted with. The purpose of revisionism is to make deterrence extremely hard and to encourage rival great powers to accommodate them diplomatically or to limit their response, to the point of being ineffective. While a regular security dilemma between two status quo powers can be addressed with reassurance and transparency, a revisionist power will not be satisfied with the restraint of others.

The most important piece of the post-war world order is not the United Nations or international financial institutions, important as they are. It is healthy regional orders. It will be truism to accept that America's greatest success after World War II was to create a system in Western Europe and North East Asia that brought an end to German and Japanese imperialism and provided the basis for shared prosperity. One has to accept as a realist that If those regional orders fall apart, so will the global order. A war between China and Japan, for example—the world's second and third largest economies, would have massive repercussions for the global economy. A Russian incursion into the Baltics catalyzed by Ukraine crisis would raise the risk of nuclear war between the world's two largest nuclear powers.

It should come as no surprise that China and Russia are regionally focused. After all, major powers are usually primarily concerned with their immediate environment rather than abstract notions of global leadership. But it is the vulnerability of regional orders that makes the global order vulnerable. If there is a major challenge to the international order, it is most likely to occur at the regional level. It is for this reason that Russian and Chinese activities in their neighbourhoods are more reflective of their approaches to the international order than of their explicit policy on global issues, although those are also important. Ultimately, a country's willingness to Honour the norm against territorial conquest is much more important than its compliance with the dispute settlement mechanism of the World Trade Organization or voting weights at the IMF.

Great Power Competition

The concept of global security [17] is in the foremost position in the minds of international relations policymakers and government officials in most countries. However, the maintenance of global security only bears true significance for the so-called 'great powers'. These powers have the ability to influence the international stage in one direction or another, change the lives of millions, and control the future. In his book The World after the Peace Conference, Toynbee describes the concept of a great power as "a political force exerting an effect coextensive with the widest range of the society in which it operates" (Toynbee, 1926). In other words, a great power is a nation that has enough scope to successfully exert its own influence and interests on the international stage. In a critique of Toynbee, it would be good to argue that not only does a power need to have the necessary resources and political will to exert itself across the world, but also needs to have the recognition of being a great power by other foreign states and societies. As an example, Estonia in the modern-day cannot send troops to remote corners of the world or lead international coalitions at the United Nations, due to its limited resources and lack of ability to do so. By comparison, the United Kingdom does. Metaphorically, it has a seat at the table, and other states recognize the ability of the United Kingdom to impose itself on the international stage, therefore making it a global power.

In this context, it can be argued that great power competition amongst the great powers does threaten global security by analysing three major global powers: the United States (U.S. or America), Russia, and the People's Republic of China. Each of these countries has the ability to exert itself on an international stage as well as domestically, which is in coherence with the critique of Toynbee. Although, unlike the United States, Russia and China aspire to 'steal' America's position as world hegemon. Their ambitions to be the undisputed world power, currently, are just ambitions. As long as the United States, either in prosperity or decline, remains the world hegemon, the threats to security posed by China or Russia will remain constrained regionally, therefore not being a menace to global security.

The examination of great power competition being a threat to global security will be analysed by first looking at the United States. It will argue that due to the loss of American economic, manufacturing, and

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[17] Global security includes military and diplomatic measures that nations and international organizations such as the United Nations and NATO take to ensure mutual safety and security. Global security, instead, has five dimensions that include human, environmental, national, transnational, and transcultural security, and therefore, global security and the security of any state or culture cannot be achieved without good governance at all levels that guarantees security through justice for all. Security, like peace, identity and other terminologies in that fold of international political theory has attracted many definitions. Unfortunately, many contributors approach these concepts from their own ideologies. Hence, broad areas of description of the term "security" exist. If defining security is that elusive, there is little wonder why operating within its coverage is so fluid. In the name of security, people and governments have taken actions where intended and unintended outcomes have become difficult to handle. Because of its seeming lack of conceptual boundary, security, as a concept, is used to entice and whip up patronage for many political projects both at the state and international levels of politicking. Hence, Paul D. Williams argued that "security is therefore a powerful political tool in claiming attention for priority items in the competition for government attention". The following references will be useful: Williams, Paul D. ed. *Security Studies: An Introduction*, Routledge, UK, 2008. Makinda, Samuel M. *Sovereignty and Global Security, Security Dialogue,* 1998, Sage Publications, Vol. 29(3) 29: 281-292. McSweeney, Bill. *Security, Identity and Interests: A Sociology of International Relations*, Cambridge University Press, 1999. Human Security Unit, United Nations Office for the Coordination of Humanitarian Affairs, *Human Security in Theory and Practice* (http://hdr.undp.org/en/media/HS_Handbook_2009.pdf). Musarrat, Jabeen. *Governance Divide*, Pakistan Horizon, The Pakistan Institute of International Affairs, Karachi, Vol. 56, No. 4, 2003. Beres, Louis Rene. *Terrorism and Global Security: The Nuclear Threat*, Westview Press Inc., 1979.

technological supremacy versus the other great powers, and its imperial overstretch, a term that will be scrutinized later on within the scope of this essay, they run the risk of no longer being the world hegemon; therefore, risking global security in the process. The second great power considered will be Russia. Russia's great power competition will be gauged by its recently adopted policy of sovereign democracy, and how that affects its diplomatic relations with American policies, as well as how their natural resource exports influence the attitude other nations have toward Russia. The third nation to be assessed is China. China's growing economic entanglements and its 'soft power' strategies are generally considered to be a large threat to not only the position of America but also world peace. Though, as long as America remains the world hegemon, neither China nor Russia, will truly threaten global security, however much these countries wish to become the world power. Overall, the essay will take a Machiavellian view of great competition, meaning that the urge to compete and crush inferior nations is inbuilt in the concept of international relations. The 'victory or death' mentality of this world view means that the idea of great power competition, or even interaction, is a significant threat to global security and peace; this therefore would mean that with the diminishment of America, the preverbal 'vultures' have begun to circle waiting for their 'time in the sun'.

Firstly, the discussion around great power competition threatening global security must start with discussions around the world's current, or now former, world hegemon — the United States (U.S.). The U.S. has been the sole world power since the fall of the Soviet Union in 1991 and has been a strong presence on the international scene, arguably, since the end of the First World War. Currently, the United States' position no longer looks as solid as it has in previous decades, which invites other great powers to attempt to become the world hegemon, therefore threatening global security.

The primary factor in arguing for the U.S.'s decline causing great power competition with the other great powers, and therefore, creating an unstable world, is the loss of the gigantic economic gap it has over other nations. For many years the U.S. was the predominant economic power in the world, especially with the collapse of the Soviet Union; the U.S. and the world viewed American economic power as unstoppable (Grunberg, 2005). However, with the emergence of China, the European Union, and India as possible economic rivals, the U.S.'s position is far from the one it had in the late 1990s. Kemp argues that due to the transfer of America's industries overseas, they became reliant on foreign powers and, therefore, diminished their position in the eyes of international powers. (Kemp, 1990). Kemp's analysis of the U.S. economic situation is, I believe, largely correct. For example, U.S. plastics manufacturing has largely moved into West Asia, especially China (China Briefing, 2011). America's howling out of its manufacturing and industrial base diminishes its status as a world hegemon because, no longer having its industry in its national territory, this allows China to gain a better position over America. The Sino-American industrial relationship is one of deceit and Machiavellian jostling due to the underhandedness of this dispute. As long as America is the dominant power in this relationship, however, global security will be largely secure as China will not dare to challenge America's power in open confrontations; China will wait until America is no longer a world hegemon.

Finkelstein argues that, unlike previous industrial revolutions that America has experienced, it will not be able to keep up with the 'Third Industrial Revolution' as he puts it. He argues that the U.S. will fail to

grasp the opportunity to revolutionize its society and institutions in line with the technological innovations going on elsewhere: the invention of the computer, fibre optics, and improved missiles for example (Finkelstein, 1992). Although Finkelstein's analysis is now out of date, he hits on a crucial point relating to the attitude of American economic policy. Though America, unlike Finkelstein's viewpoint, maintained its position as a leader in technological development, it blundered the opportunity to limit other great powers in also improving their technological capabilities. For example, Russia's recent development of the Tsirkon 3M22 Missile, a hypersonic missile, has caused large concern on the international scene (Cole, 2021). This development of highly advanced military equipment is a by-product of America's failure to successfully maintain its technological dominance in the world. A decline of American technological hegemony is a large and consequential event for the concept of global security. Without However US is taking steps to retain its technological dominance,. Consequently the global Technological Competition will be highly contested. The lack of fear, as seen in previous decades, allows other great powers, namely America's enemies, but also her allies, to challenge or subvert the world's peace in an attempt to profit from the existence of a power vacuum, which, therefore, threatens global security.

The economic, technological, and manufacturing situation of the United States is not hopeless. Additionally, it is good to remember that a declining nation is not a dead one, and recovery is always possible. In his book, End This Depression Now!, Krugman argues that strong and decisive economic stimuli must be made in order to pull America up from the depression it was in during the Obama administration (Krugman, 2013). If America manages to reverse its decline, then global security will be solidified. A stronger America would cause nations like China or Russia to not have the capabilities or desire to threaten global security without risking the reaction of America.

Furthermore, the American web of alliances and military engagements has caused its 'empire' to experience imperial overstretch. In the Rise and Fall of the Great Powers, Kennedy argues that the term imperial overstretch is when the power in question has "a vast array of strategical commitments which had been made decades earlier" (Kennedy, 1988). This assessment of a great power being overwhelmed by its obligations fits with the current position of America very well. Since the Second World War, America has, either intentionally or otherwise, found itself with international commitments that have a global reach. This concept is echoed by Burbach and Tarbell who argue that America aims to spread the Neo-Liberal model to "less sophisticated" nations (Burbach & Tarbell, 2004). This attempt to impose American ideology can be seen throughout the last century. The Vietnam War, military coups in South America, and U.S. military occupations in the Middle East are examples of this attempt to eradicate opposition to the American worldview. As a result of these incursions, America has worn its military capabilities too thin. If America's military might is stretched too thin across the world, or at the very least diminished, then the effects on the globe's security are significant as it leaves a power vacuum in less stable parts of the world where the U.S. has, depending on your attitude toward America, either occupied or liberated. This power vacuum will soon be occupied by another great power, causing conflict, disputes, and possible violence, which would cause global security to be in peril.

This idea of the U.S. being in terminal decline is challenged by Lieber. He downplays the urgency to fix America's problems. He argues that America, as well as previous world hegemons, has experienced decline and then rebounded from that decline (Lieber, 2012). This argument does carry ~~with it~~ some weight. For example, when the British Empire lost the Thirteen Colonies it was costly, being the most populous proportion of the Empire at that time (Canny, 1998, p. 92). However, even due to this significant loss, the British Empire went on to dominate the world, regaining its losses with the East India Company, Suez, and Hong Kong. This suggests that the U.S., though in decline, could, if it had the political will, reverse its misfortune, and regain its position as an undisputed world hegemon, therefore, solidifying global security. However, even if the U.S. could reverse its decline due to its imperial overreach, the weakness America currently displays in its armed forces, especially after the chaos of the withdrawal from Afghanistan, highlights to other nations that it is no longer a force to be respected. Similar to the U.S. decline in technological and industrial capabilities, a lack of American presence causes the globe to be less secure as it invites competition to become the world hegemon.

Secondly, the position of Russia must be considered when debating whether great power competition threatens global security. Russia is an exceptionally traditional nation and has always, in my opinion, been separated from the powers of central and western Europe. This feeling of separation has caused Russia to become distrusting of The West — it forever wants to be 'part of the gang' and but enjoying the independence being ostracized brings with it. These two sides of Russia, Russia the West and Russia the mysterious, are the fundamental crux of its foreign policy, security tactics, and diplomatic actions.

In his book, U.S. Regime Change and Great Power Assertiveness, Tsygankov argued that the position Russia currently takes on the West is an attempt to protect European values and assert its sovereign democratic rights (Tsygankov, 2016). He argues that Russia views the world, and especially Europe, as a collection of independent states which have the right to govern themselves. I would argue that this is a largely correct analysis of Russia's position. In the now-famous speech at the 2007 Munich Security Conference, Putin fiercely defended Russia's right to maintain its sovereignty and argued that a unipolar world, the idea that world power stems from one state, was no longer feasible (President of Russia, 2007). This idea of a multipolar world is a cause for concern for the concept of global security. Without a strong and decisive centre of world power, the globe will descend into different nations acting in their interests, devoid of any supranational authority that can properly keep the world peace.

Also, Russia's current position in Europe has been stronger than it has been in previous historical periods. The fall of the Soviet Union, in 1991, brought with it nine years of political struggle and uncertainty. However, under the leadership of Putin, Russia has managed to turn its fortune. The new Russia should be a concern to the West, especially to the European Union. Lucas argues, quite correctly, that Russia's position in Europe is advantageous for its political and foreign policy, that being the upkeep of its democratic sovereignty, due to its strong oil and gas exports (Lucas, 2014, p. 213-217). The strong natural gas exports are mainly to Germany (Rystad Energy, 2020; Gazprom Export, 2021). This fact is significant, due to the broader ramifications between Russo-German relations, and to a greater extent, relations between Russia and the European Union. In a somewhat hypocritical move, Russia has managed to diminish the sovereignty of

Germany, as well as many other oil and gas-dependent countries in Europe, to bolster its position on the world stage. In the context of great power competition threatening global security, an observer should not be surprised when dealing with hypocrisies in international relations. Russia's stranglehold on Germany, and other states of the world, is a cause for concern for the security of the world, as it allows Russia to act without proper international backlash. This could be seen in Germany's tepid response to Russia's incursions into Ukraine in 2013-14 (Spiegel, 2014). Russia's position in having such a large natural resource to export to Europe is a symptom of a larger problem. If a sovereign state can dictate through force, coerce, or manipulate another sovereign state into either acting or not acting in their interests, it poses a threat to global security, as it allows a state to act separately from the global community. If one great power can use Machiavellian tactics, such as manipulation and coercion, against another great power to achieve its strategic goals it causes a threat to global security. A state with all the power can wield significant damage to global security.

Overall, I would argue Russia's position is not one of massive international concern. The Russian threat, or what Westerners perceive it to be, is not the massive bogeyman as it was in previous decades. With the Soviet Union dead, the Russian psyche must be one of defence first due to its massive loss of perceived friendly territory. And with NATO's expansion into what Russia could perceive as its sphere of influence, the West risks igniting tensions that shouldn't exist. Perhaps the duality that Russia seems to have only needs to be coaxed out to be a cooperative member of the European Community. A cooperative Russia would benefit not only peace in Europe but also global peace.

Lastly, when dealing with great power competition threatening global security, the role of China must be analysed. China has a rich and complex history and culture; from the Qin Empire to Xi Jinping, China's civilization rivals that of even the great Empires of Europe. As Kissinger argues, in his book On China, the Chinese view themselves as having a national destiny to be, not only the dominant power in Asia but also the world hegemon (Kissinger, 2012). And with China's recent diplomatic feelers in the international arena, incursions into the South China Sea (Sevastopulo, 2021), and threats against Taiwan (Patel, 2021), they, like Russia, are testing the will of the West – but more specifically the United States. However, some argue that China cannot, and can never, become the world hegemon due to economic failings and domestic crises.

Though China boasts, and can rightly do so, of being the second-largest economy in the world (Research FDI, 2021), its economic capabilities are not as impressive as first thought. With Chinese economic modernization came, similarly to the United States, international obligations. As Li argues, China has become too interdependent and connected to the world economy to be a major threat to global security (Li, 2004). This is somewhat correct as a great power like China cannot invade or wage a war on another power, whether it is against a minor power bordering China or a great power overseas. Concerning Li and similarly the American industry, China has developed an overreliance on the importation of minerals from Africa (Devaland, 2009). This overreliance on a foreign power's resources, in this case, minerals, is a large cause for concern as, like the ability of Russia to manipulate other European countries, China is influenced by another power.

Though China might not be able to threaten global security in the military sense, the great power jostling can be felt through diplomatic and financial means. China's attempts to wield soft power, to develop its position on the world stage, could be a cause for concern for global security. Dumbaugh (2008) is correct when arguing that China's infiltration of world organizations is an exercise in soft power. With China joining the World Trade Organization in 2001 (WTO, 2001), and it is looking more likely that China will join The Trans-Pacific Trade pact (Reuters, 2021), just to name a few organizations, it suggests development in their soft power strategy. Its attempts at increasing its obligations, and thereby increasing the quantity of great power competition, have become more and more obvious. However, though China has undoubtedly advanced its position since the fall of the Soviet Union, I would argue that the threat China poses to global security through its competition with great powers, is largely minimal — and will be confined to China's immediate proximity. About Kissinger's argument, Hoo views Chinese foreign policy, during the Xi regime, as being fiercely China First (Hoo, 2018). This could be a problem for both global security and how other states interact with China, as a China that views whatever it does as infallible, it leaves no wiggling room to either compromise diplomatically, or avoid international crises: Therefore, risking the escalation of conflict. Though China does not yet possess the title of world hegemon, but its ambitions most definitely include that. The attempts, as Dumbaugh (2010) argues, to infiltrate world organizations is an attempt, like the United States, at spreading their influence to a greater extent than without these organizational groups being there. But, as long as the U.S. is the world power, then that impedes China, or for that case Russia, from becoming the world hegemon.

Overall, China's ambitions to become the world hegemon are undoubtedly there. The incursions into the South China Sea and the rustlings of overtaking the United States as the largest economic power are indications of this desire. Although, this desire will remain simply a dream as long as America remains top dog. The world may see significant threats to its security in regional areas (Indian-Chinese border, South China Sea, Korean Peninsula) in China's bid to become number one, but as long as the United States can maintain its position, global security will remain together.

Conclusion

The concept of great power competition threatening global security is undeniably obvious, the horrors of the 20th Century are simple reminders of this fact. However, with a world hegemon, those threats are far less significant, almost negligible. American power has and hopefully will, continue to bring order to the world. Though China and Russia, and other great powers, may envy the U.S. and wish to replace her as world hegemon, it is unlikely they will do so. As long as America can be more Machiavellian than that the other powers and retain its national cohesion, global security will remain secure for the foreseeable future.

Recommendations

To achieve Strategic Autonomy, India needs to enhance its strategic competitiveness vis-à-vis China and other authoritarian powers. In that regard, the following recommendations are made:

1. Pursue military modernization to continue to reorient India's defense policy toward dealing with major power competitors. The United States must also integrate initiatives to improve strategic competitiveness with efforts to rebuild the domestic economy after the pandemic, including a strategic approach to technological innovation and reducing the vulnerability of certain sectors of our society to interdependence with adversaries. Strategic thinking must also be integrated across all relevant government agencies and departments.

2. Next, competition with China in a positive and affirmative vision of the free world, which we would continuously work to strengthen and improve. This would include: increasing the free world's resilience to pressure and shocks from authoritarian states; protecting democracy and the rule of law from illiberal forces; coordinating on technology policy; enhancing cooperation on transnational challenges such as climate change and global public health; and developing a suite of capabilities to shape the international order. It must also involve an ambitious and proactive effort to help free societies and like-minded partners recover from the pandemic, including in the developing world.

3. Continue to deepen Indo-US alliance and partnerships in the Indo-Pacific, including by focusing on deterrence by denial, improving the credibility and resilience of the Indian. presence in the region, encouraging cooperation between allies and partners, assisting allies and partners in responding to external coercion and interference, deepening cooperation with US, Japan, Australia and South East Asian countries as it balances against China, and time has come to strengthening ties with Taiwan.

4. Reform the defense spending target for India to incentivize European allies to invest in civilian as well as military capabilities—such as new technologies—that would enable them to compete with China.

5. Facilitate a national conversation about the type of strategic competition that India want to engage in. Great power competition is not a strategy in itself; it is a condition that we must cope with in all of its dimensions. We are still at a relative early stage in identifying different strategies of competition.. Over the next ten years, India must refine and develop thinking on the objectives of the competition and the means to accomplish these accordingly.

Acknowledgement

While composing this position paper, I have not digressed from the research method by adding the many essential footnotes. However, I will be remiss if I do not acknowledge the numerous other writings of scholars, professional in the field, US Congressional Research monographs, UN Reports and number of independent papers on the subject. I have taken the liberty to quote and rearrange their thoughts to provide seamless output in this deliberations which has not appeared so far to my known knowledge. I would like to acknowledge all the authors whose work has enriched my understanding and assessment.

Notes

CHAPTER III

National Security Resilience (NSR) Capacity Building:2023-2047

Ravinder Pal Singh

Background

India and China – Neighbours and Rivals

Over the centuries, India and China did not have common borders neighbours. The region had three civilizational states: China, Tibet and India. In the event of China occupying and reducing a civilizational state Tibet, which was the buffer between the two, China became India's neighbour. Ever since India's Independence, its' security concerns have emanated from Pakistan, except for 1962 border conflict with China. As India's border with Tibet have remained un-demarcated, threats from China will get activated as and when it suits China. The Chinese in the past three decades have followed Deng Hsiao Peng's advice that: "China should hide our capacities and bide our time; be good at maintaining a low profile; never claim leadership." In this period, China has eradicated poverty and food scarcity; grown its economic and industrial manufacturing capacities; developed competitive military technologies for making and exporting weapons. The Chinese comprehensive power has grown more than five times stronger than India's. Consequently, it has developed a perception of invincibility of Chinese military power. This communicates deterrence through strategies of coercion, military intimidation or containment.[18]

Three elements that drive Chinese nationalism are: one, never again would the Chinese suffer the experiences of the Century of Humiliation (1839-1949) at the hands of foreigners. Two, the Chinese led by the Communist Party of China (CPC) has to correct the historical wrongs where territories on its borders had been seized during the colonial period. Three, hubris of wealth, power and influence that creates public optimism in China, as a super power in Asia, drives its public support for the Communist Party. The Chinese strategy is to play Weichi or Go in their power relations. A 2500 years old board-game, which avoids direct confrontation with the main challenger, in this case, the USA. Instead, use strategies to strengthen one's position by gaining advantageous spaces that are not intensively contested. If China's main challenge remains the United States, then it will need to avoid getting into the proverbial Thucydides trap.

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[18] Writings : Xuetong Yan, Scholars at CICIR, Tsinghua University, China Academy of Military Sciences, et al.

China recognizes sovereignty of states, but it does not recognize equality of states. It has created legal instruments to support an assertive security policy such as recent China's Border Security Law of 1 January 2022. It empowers local commanders to restore perceived territorial loss of the colonial periods, which includes Chinas claims to a much larger exclusive economic zone by creating artificial Islands in the South China Sea.[19] In the Asian region among China's bordering territories, Japan and India, are perceived to have potential to contest the Chinese power. Japan's Treaty alliance with the US and a stronger industrial and technology base gives it economic resilience. The Chinese analysts, assess India as a 'lower hanging fruit': a large demographic power, but low on in terms of military, industrial or economic strengths, and a weak political mobilisation of the Indian society, which is seen as fractious vis a vis China's capabilities.[20]

Till 1990, the two economies were at par, but Chinese leaders raised their country's human productivity through secondary education and economy through poverty eradication. In contrast, over the past seven decades, the Indian leaders have been into rhetoric and re-electability, at the cost of country failing to build resilience in its economy and societal capacities. The evidence of India failing to convert the World's largest demographic asset into an economic strength is in World's fifth largest economy, failing to lift itself from World's 142 ranking of per capita income?

1.1 Significance of National Security Resilience

The intent and purpose of National security resilience is to develop a nation's capabilities to sustain higher intensity of conflicts and endurance to impose prohibitive losses to the aggressor. Perceived risks of such losses, could deter an aggressor nation.

National security resilience capacity-building should aim to develop sustainability in a country's military effectiveness to outlast and overcome its threats. It requires policies, processes and implementation structures that institutionalize convergence of military capabilities and the nation's food security, its industrial, economic, technological and financial capacities for strategic autonomy. It may require creating structure of national security resilience agency for convergence with nation's socio-economic development.

Our country has experienced seven decades of socio-economic policies which have been driven more by electoral opportunities, rather than a coherent and coordinated implementation of such objectives. The limitations in and the yawning gap in India's socio-economic performance has resulted in the threat differential that it faces. It requires India to identify additional security imperatives from selected socio-economic sectors, on the basis of scale, scope and multiplier values through innovation. Unless coherence is developed in India's national income and consumption through a focus on increasing our country's revenue and financial resiliency, simply comparing annual GDP allocations to national defence, reveals inadequate grasp of how nations fail or build their weapons and technology acquisitions for its strategic autonomy.

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[19] Although China uses the term "jurisdictional seas" to describe contiguous zones to its exclusive economic zone (EEZ), and make claims on Islands outside its EEZ, such as in the SCS and in continental shelf. The term is not recognised in International Law.

[20] Xue Tong Yan, op cit.

The threat that India now faces is evidence of failure to build its economic growth. On the contrary, three decades of economic growth has made China into an invincible power in Asia, that clearly aims to contain India, as a subordinate actor. Unless our apex level policy-makers begin to implement our country's socio-economic objectives with clearly defined outcomes and timelines, unless they implement processes for convergence in India's economic and security sectors, and unless we understand multi-dimensional character of national security concerns in uncertain futures, India would continue to languish as a resilience-deficit actor? Unlike India, the Chinese do not view their dispute in terms of territorial or cartographic issues, but as an impediment in its hegemony. As this perception creates threat uncertainty, the paper explores approaches to build strategic resilience. Resilience Studies needs to develop into a significant field of inquiry to systematically analyse security sector resiliency is dependent on social, economic, financial, industrial and advance technology sectors.

The emerging multi-polar world order, also indicates essentiality of resilience studies, with limitations in controlling the duration and scale of conflicts recedes with diminished bi-polar order of the Cold War period. The Russian-Ukraine conflict of over past one year, does not indicate that wars of 21st Century are likely to be short sharp affairs, like the India-Pakistan or the Arab-Israeli conflicts. While Israel's access to US weapons stocks from its patron's weapons holdings and inventories consumed could be recreated by the American industrial capacities. India requires different planning parameters and capability building in cases of a future India-China conflict getting into grinding and protracted struggles.

National Security Resilience (NSR) capacity building aims at national processes and ability of converting assets and industry to sustain intensity and duration of conflict, at levels higher than what threats can bring against it?

Need for Public Discourse on Building India's National Security Resilience (NSR)

In the context of the foregoing discussion, a public discourse is needed to frame the significance of NSR in terms of capacity building needs in India. Primarily to understand the challenges and barriers; potential value, the policies and practices required for building resilience in security sector's capacities to impose prohibitive damages to the aggressor in the Himalayas and in the Indian Ocean Region. The public discourse should examine the changes required in the state's institutional capacities and in the industry; economy, financial and technology sectors to supplement India's NSR requirements. It will require institutionalizing two steps: one, processes to integrate, facilitate and implement cost efficient decisions for NSR to converge with opportunities in India's economic, social and security sectors. And two, if India were to build NSR as a national initiative, how would one coordinate a whole of society approach?

If NSR is defined as enhancing national productivity and resources to convert into capacities for deterrence, that should aim to create realistic perception of risks of prohibitive losses to the aggressors, both military and political. What sectors need to be modified to enhance socio-economic productivity that will add to security sector resilience? What kinds of national legislation, public or private institutions or special

purpose implementation vehicles will be required to sustain NSR capacity building. A mutually reinforcing relationship between NSR and the need for country's strategic autonomy would balance India's arms acquisition capability building with views of socio-economic policy-makers.

Aims, Approaches and Initiatives for Enhancing Comprehensive Strategic Power

Chinese strategy for containing India is in three forms: one, keep the LAC un-demarcated and unresolved to use the border dispute to lean on India: indicators were at Galwan, Doklam and Somdarung Chu. Two, increase calibrated pressures on the LAC by deploying PLA divisions in strength, as and when opportune, because majority of Indian population resides closer to border regions making India relatively vulnerable along the LAC. As opposed to China, it's population Centers are well away from the LAC. (INDIA-CHINA POPULATION DENSITY CHART). In this strategy, elite capture in the buffer states of Nepal and Bhutan, joint training of their armed forces and the PLA. And three, stretch Indian military-industrial capabilities to its breaking points in handling the combined threats of China and its long standing South Asian proxy: Pakistan.

Even without a conflict on its Western borders, half of India's security assets have already got locked down by this collusion. [21] Consequently, policy challenges that confront India will find this threat asymmetry getting wider, and India's capabilities will need to endure these threats in times to come. Among the Chinese aims in maintaining confrontational pressures on India could be three to begin with: one, dissuasion and risks of openly aligning with the Quad against China; two, India's sovereignty is accepted, but only as a subordinate actor to China, recognizing the latter's hegemony in Asia and Indian Ocean Region; and three, influence India to replace its pursuit of strategic autonomy, with a policy of unapologetic attention to China's concerns.

Consequently, India's security policy-makers need re-assess some of the fundamental assumptions of national security. Do they need to build national security resilience to sustain intensity of operations in time frames longer than threats can bring against India?

This leads to questions on initiatives required to build convergence of nation-wide resources of economic, industrial and technological resilience to balance the power asymmetry with the primary threat: China, without diverting its resources from socio-economic concerns? A corollary to this question would be how established security assumptions monopolize professional views and resist interrogation to change?

Three illustrations of unverified narratives are being discussed: One, operational logistics stocking capacity required for intensive war fighting. Two, public discourse that keeps calling for increase in GDP allocations to defence budget for military power instead of looking at value alternatives to enhance security

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[21] As the Chinese regard India as a threat, that is why an un-demarcated border gives them an open opportunity for political military containment operations. Containment is a war strategy is culturally conditioned by the Han Chinese tutored in Sun Tzu's Art of War "keep the enemy under strain and wear him down" p.99 "Agitate him and Probe him" p.152 (Samuel Griffiths, Watkins Publishers 2005).

sector resiliency. Three, comparative impact of GNP or PCI on building military effectiveness. It needs to be noted, that assessments of national power are different from assessments of military effectiveness.

Studies on NSR theory intend to contribute to developing policy frameworks for building an eco-system that supports national security resiliency through convergence of wider strategic and developmental capacities. The scope of such narratives will be broader than, the current GDP allocations to defence budget type assumptions that are applied in our defence threat narratives. The debate needs to be wider to include policy and processes that have remained neglected for national security resilience building.

Thereafter, the need will be to debate the concept, framework and structures of NSR to define a National Action Plan for implementing NSR strategies. What kinds of eco system of process research, training initiatives and performance evaluation parameters are necessary for creating NSR capacity building plans? For example: relationship of poverty eradication and achieving educational standards with NSR; power generation for competitive manufacturing and building advanced technology export competitiveness on military industrial conversion capabilities. Reducing dependency of critical industrial and mineral imports and build capacities to absorb economic shocks.

Selected Pillars for Building Capacities in National Security Resilience (NSR)

To develop a practical shape and provide a formative understanding of NSR framework, it is suggested that to begin with, following eight pillars could be discussed to focus on:

(i) Rethinking dependency of strategic autonomy on national security resilience in view of changing nature of conflict, such as: wars of attrition, controlled intensity of military coercion and intimidation, cyber-attacks on nation's commercial privacy. Walking the balance between politico-military isolation, dependency in absence of India developing strategic autonomy through industrial economics. Impact of multi-polar world to reduce conflict management capabilities of former super powers.

(ii) Operational resiliency to sustain conflict endurance. NSR and military capabilities required for border regions and Indian Ocean region (IOR) to deter Chinese perceptions of invincibility with probability of imposing significant military risks and costs to the aggressor. Stocking policy; replenishment and operational sustainability in the context of long duration conflicts; limitations of manpower in handling sophisticated equipment; repair and restorability. Impact of multi-polarity on conflict planning and stocking time-lines based on the past experiences.

(iii) Enhancing Comprehensive Strategic Power (CSP). Examine limitations of assessing national security resilience in terms of allocation of the GDP to the defence budget. Examine implications of low per capita income (PCI) on constraints in arms and technology acquisitions? Impact assessment of selected initiatives to be pursued in Socio-economic, industrial and advanced technology sectors for building national resilience for CSP.

(iv) Economic capacities for national security resilience: Conversion of economy, industrial, technology sectors. Country's abilities to absorb conflict-related shocks on economy's primary, manufacturing and service sectors for provision of essential goods and services.

(v) Financial Sector Resilience: Integrated financial planning, trade diversification; financial system resiliency stability to absorb shocks of long duration conflict; ability to reconfigure and recover to restore financial services.

(vi) Impact of social polarisation on national cohesion; de-radicalisation of social fault line an essential national security imperative? Pursuit of exclusionary welfare-ism for electoral gain that could undermine trust and resilience in the society.

(vii) Conversion of national industries and assets to meet surge in military demands on war mobilisation. Institutionalisation of private sector industries and asset conversion for major equipment and warlike stores for prolonged mobilisation required for grinding and protracted operations.

(viii) Identify and develop advanced technologies through integrated commercial and operational deployment of entrepreneurial finance to provide cost-effective innovations to sustain export competitiveness in these emerging technologies. Discuss delivery and R&D limitations of advanced technology open competition development model, instead of an exclusive control of public sector R&D model.

Hypothesis to Interrogate Three Narratives

Decision-making is often attended by cognitive bias, group beliefs or confirmatory bias. These get pronounced in the cases of military opinion offered on security matters, which excludes scientific interrogation of multi-disciplinary experts. Cultural or affinity bias also lead to developing preferred outcomes in judging situations through group-beliefs. To build resilience capacities, decision-makers have to consciously reduce impact of such bias by scientific interrogation of national security narratives, even if it runs contrary to the establishment's professional opinion.

Keeping in mind the bias operating in identifying national security imperatives, the paper examines national security resilience as a dependent variable on a country's economic, industrial and technological capacities by examining three narratives:

- One, adequacy of operational logistics stocks for ten days of war-fighting at intense battle rate (as confirmed to Parliamentary Standing Committee for Defence).
- Two, should assessment military effectiveness be estimated on the basis of GDP allocations to the defence budget or assessment of national military power should combine net GDP and PCI growths of a nation;
- Three, should nation's strategic autonomy and national resilience dependent on advanced technology export competitiveness and industrial capacities.

Narrative 1: Sufficiency war fighting stock for prolonged conflicts?

If assumptions of Chinese scholars on invincibility of the PLA,[22] are examined as a consequence of China's economic development, this is also a major contributor in building China's military capability to sustain for long duration conflicts, which would get prolonged by absence of bi-polar restraints witnessed in the Cold War period. Indian military's assumption may not get scientifically validated when logistics stocking policy is planned for ten days of intense fighting. How would a military enable adequate operational flexibility and sustainability, if conflicts stretch out for a longer duration without industrial conversion capabilities to meet surge in demands?[23] However, planning remains dependent on group-beliefs and affinity bias.

Narrative 2: Limitations of GDP allocations for assessing Military's effectiveness or combination of Net GDP and PCI?

It is generally assumed that military power is a product of the size of a country's GDP allocations to defence budget to serve as a proxy indicator of the state's military power. Consequently, defence budget is often used as for a nation's military capabilities. It needs reiteration that GDP is only an aggregation of goods and services indicating a country's economic performance for a particular year. Allocations of the GDP to defence sector are indicators of military's burden on society for that year, among other burdens, such as Health and Education etc.[24] The World Bank, which funds country's development programmes, and the IMF, which gives large loans to states to avoid debt defaults needed a norm to assess a country's viability to repay on criteria such as: its GDP growth rate; current account and trade deficits, balance between defence and development expenditures, allocations to other discretionary expenses, etc.[25] To enable discussion on restraints on discretionary expenditure on the military, as ratio of GDP, these institutions began using defence budget data for purposes of norms setting. For inexplicable reasons, India's defence community, began to link India's GDP's allocations to defence budget as indicator of military power. In the last decade, India' defence budget ratios of GDP have ranged between 2.9% to 2.5 %, while Indian defence experts sought allocations of 3% of GDP to the military expenditure, assuming that increase in such allocation will build hard power for national security.[26]

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[22] Chinese scholars compare national power in terms of four indicators namely: Military, Economic, Industrial and Demographic power. In assessment of early 21st Century State Power Structures for China, France, Britain, Russia, Japan, Germany and India, China is assessed strong in all the four indicators, whereas, India is assessed strong in terms of military and demographic power only. Xue Tong Yan, "Rise of China and Its Power Status" Chinese Journal of International Politics, Vol. 1, 2006, 5–33, pg 21.

[23] Deposition of VCOAS, Lt Gen Sarath Chand at the meeting of Parliamentary Standing Committee in March 2018, because of paucity of funds to stock arms, ammunition, spares are limited for 10 day intensive war. "Indian defence forces out of funds, won't sustain 10-day war, says Parliament Standing Committee". Gurung , India Today. 14 Nov 2018 and *Shaurya Karanbir (14 Mar 2018).* "Shortage of funds a big worry, says Army to Parliamentary Panel". The Economic Times. Retrieved 14 Nov 2018.

[24] Indian defence budget as a ratio of the country's GDP has ranged between 2.89% to 2.5 % in the last 10 years. India defence experts suggest that Indian government should allocate 3% of its GDP to the defence sector expenditures. See Statista.com and India's Defence Spending in Seven Charts Times of India 30 Jan 2021. http ://timesofindia.indiatimes.com/articleshow/8060025.cms?utm_source=contentofinterest &utm_medium=text&utm_campaign=cppst.

[25] Interviews with staff from the IMF Policy Development and Review Dept. and the World Bank's, Post Conflict Unit: these ratios were developed as information tools to discuss balance between external debt and defence budget. However, both these institutions are wary of using these linkages, being a touchy issue beyond the remit of both these institutions. However, the international and national socio-economic debate tend to use these linkages to restrain military expenditure demands

[26] See statista.com and India's defence spending in seven charts Times of India, 30 Jan 2021, Gen Kalita interview???

As these arguments are not driven by verified analysis, Think Tanks argued for the increase in defence budgets to 3% of GDP, without exploring scale of threats or options to meet them. Consequently, public belief was established that an increase of GDP allocations to India's military expenditure will add to its military effectiveness. Annual GDP may fluctuate with boom or bust cycles due to inflation, stock markets or financial and oil sectors etc. The GDP indicators are not stable, even as a country's debt increases or its natural resources deplete, the GDP can rise or fall precipitously in free market economies. Therefore, using GDP as sole assumption of military power is logically inconsistent.[27] It indicates influence of confirmatory bias and group beliefs among India's security analysts.

A process which uses GDP to decide a country's annual military and technology acquisitions (factors of hard power), will continue to have limitations of coherence and predictability in long term plans. However, a stable and steady indicator of allocations to hard military power from an economy can be developed from its per capita income levels, and related factors that influence a country's socio-economic resilience.

As decisions to acquire major weapons or technologies are at the State's discretion, such decisions get constrained by competing socio-economic demands. Therefore, use of GDP allocations as an exclusive indicator does not provide accurate or empirical proxy to develop national security resilience. A country's public needs to understand constraints of financial indicators on acquisition of military capabilities and effectiveness. For that reason, NSR capacity building policies needs to implement convergence of selected socio-economic factors that also build the society.

Narrative 3: Strategic autonomy is dependent of NSR which is dependent on PCI

Wars are started, fought and progressed over a variety of assumptions, foremost among these are false optimism. At times, decision-makers assume that diplomacy can develop strategic autonomy for a country without developing its NSR capacities. At times, disputes quickly escalate into wars because security and diplomacy decision-making operate in separate silos often leading to false assumptions that military power can provide the desired political objectives.[28] Confirmatory bias in political decision-making process often results in mistaken assumption of its military's power, specially where diplomatic, economic, financial sectors have not developed coherent assessment process with defence sectors.

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[27] See Joseph Stiglitz, "GDP Is the Wrong Tool for Measuring What Matters," Scientific American https://www.scientificamerican.com/article/gdp-is-the-wrong-tool-for-measuring-what-matters/ As economists focused on the intricacies of comparing GDP in different times, across diverse countries and constructing complex economic models that predicted and explained changes in GDP, they lost sight of the metric's shaky foundations. Experts seldom studied the assumptions that went into constructing the measure—and what these assumptions meant for the reliability of any inferences they made. Instead, the objective of economic analysis came to explain the movements of this artificial entity. GDP became hegemonic across the globe: good economic policy was taken to be whatever factor increased GDP, the most. The study by Amartya Sen, Jean-Paul Fitoussi and Joseph E. Stiglitz, "Mismeasuring Our Lives: Why GDP Doesn't Add Up." New Press, 2010, assesses the limits of GDP as a measurement of the well-being of societies, for example, how GDP overlooks economic inequality, that shows how most people can be worse off, even though GDP income is increasing.

[28] Recent examples: President Putin's assumption of replacing the present Ukrainian Government with a favourable one was based on their General Staff's assumption that operations against Ukraine will get over in two weeks time. US troops surge in Afghanistan by President Barrack Obama in 2009. Some earlier examples are: the Bay of Pigs in Cuba in 1961; the US Army surges during the Vietnam War. Setbacks suffered by the Indian Government's forward policy in NEFA and Ladakh was in absence of efforts to build sustainable national security resilience.

Assessments on post-conflict outcomes show relative accuracy in measuring comprehensive power when per capita income (PCI) is coupled with Net GDP Costs: (after excluding expenditures on costs of production of goods and services; welfare; internal security and domestic policing). Such studies show a more accurate proxy for military effectiveness, as the side with higher Net GDP and PCI, has won nearly 70% of disputes and 80 % of wars.[29] Reasons for finding a higher PCI as a more accurate proxy of military effectiveness are because high PCI countries have: a higher standards in education and better technology diffusion in its civilian economy.[30] This enables it to have manpower efficiencies in military equipment maintainability and serviceability of transportation fleets, as well as restorability of equipment damaged in adverse battlefield conditions. Better education also enables training of a larger number of military volunteers to operate complex weapons systems in shorter time frames. Higher PCI also enables larger mobilisation military manpower to innovate new technology intensive systems for reconnaissance, surveillance, target acquisition and precision engagement (RSTAPE).

In terms of technology R&D and industrial resilience, a country with higher PCI has higher utilisation of machinery and equipment (M&E), thereby develop flexible manufacturing of products to export competitive standards by converting its precision engineering industries. Consequently, during intense operations, these industries can meet surge in demands for weapons and spare parts. A country with higher PCI also have advanced technology R&D sectors to innovate new weapon systems for rapidly evolving battlefield counter measures in shorter time frame. Consequently, countries with higher PCI will have technology-industrial convertibility advantages and deploy their financial, economic and technology strengths to for national resilience. Countries with large GDP and large manpower can provide larger mobilization potential, but not necessarily, military efficiencies or effectiveness. Evidence on the question is clear: can country's economy sustain its military capabilities and war fighting resilience? Enhancement in China's military potential is a consequence of its per capita income building up since early 1990s. China's rapid industrial development, led its ability to modernize PLA and build-up of its military technology potential and from there its security sector's resilience.[31]

In view of the foregoing, it is incredulous that Indian military planners continue to assume adequacy of logistics stocking at scales of intense fighting rates of ten days for the entire army? Would this scale of stocking, provide its military with adequate operational sustainability, should circumstances of conflict stretch out for a longer duration?[32] There is a need to implement the correlation of country's higher PCI and

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[29] Michael Beckley, Power of Nations: Measuring What Matters. International Security, Vol. 43, No. 2 (Fall 2018), pp. 40-41.

[30] Michael Beckley, "Economic Development and Military Effectiveness," The Journal of Strategic Studies, 19 Feb 2010, pp. 50-53.

[31] Xue Tong Yan "Rise of China and Its Power Status"" Chinese Journal of International Politics, Vol. 1, 2006, 5–33, pg 21. Chinese scholars compare national power in terms of four indicators namely: Military, Economic, Industrial and Demographic power. see: Early 21st Century State Power Structure for China, France, Britain, Russia, Japan, Germany and India. China is assessed strong in all the four indicators, whereas, India is assessed strong in terms of military and demographic power only.

[32] Deposition of VCOAS, Lt Gen Sarath Chand at the meeting of Parliamentary Standing Committee in March 2018, because of paucity of funds to stock arms, ammunition, spares are limited for 10 day intensive war. "Indian defence forces out of funds, won't sustain 10-day war, says Parliament Standing Committee". Gurung , India Today. 14 Nov 2018 *Shaurya Karanbir (14 Mar 2018).* "Shortage of funds a big worry, says Army to Parliamentary Panel". The Economic Times. Retrieved 14 Nov 2018.

it's capacities to augment its military's combat effectiveness.[33] As arms acquisition decisions are not obligatory but discretionary expenditures, these are restrained by competing demands on public finance for allocations for poverty eradication; human development, education and health projects. In countries with higher PCI, such competing socio-economic demands are weak and financial feasibility of arms acquisition decisions is higher.

A comparison of military technology/firepower PCI indicators

To understand contribution of a country's PCI to its military effectiveness, a comparative assessment is made on the ratio of military budget to a country's holdings of six major weapons systems and technologies for: reconnaissance, surveillance, target acquisition and precision engagement (RSTAPE).[34] Four countries are compared namely: France, UK, Germany and India: (i) similar sized economies in terms of nominal GDP; (ii) similar sized defence budget allocations. Three countries show a higher firepower/technology ratio to its military's manpower. Whereas, the fourth country India, has a lower firepower/ technology ratio to manpower, because of having the lowest PCI in the sample of four. This comparison demonstrates correlation of higher PCI to larger scale of firepower/ technology intensive equipment in their military as opposed to manpower. Except India, other three countries: the UK, Germany and France, show a greater balance in their PCI and military budgets.

India is unable to sustain ratios of higher value of technology/firepower to manpower ratios because of its low PCI. This explains India's limitation in acquisition of weapons systems that are lower in cost and uncertain efficiencies obtained from the former Soviet Union, creating a politico-security dependency on the Soviets/ Russians, which continues to the day. As any arms acquisition dependency undermines a country strategic autonomy, therefore one can conclude a correlation a low PCI has with low NSR and consequently, a low strategic autonomy. And the opposite holds true as well: that a higher PCI enables a higher NSR as it allows acquisition of sophisticated arms and technology for military effectiveness, and thereby, facilitates strategic autonomy. The large inconsistency in the bar chart shows India's PCI and its defence budget has an imbalance in its NSR capacities.[35]

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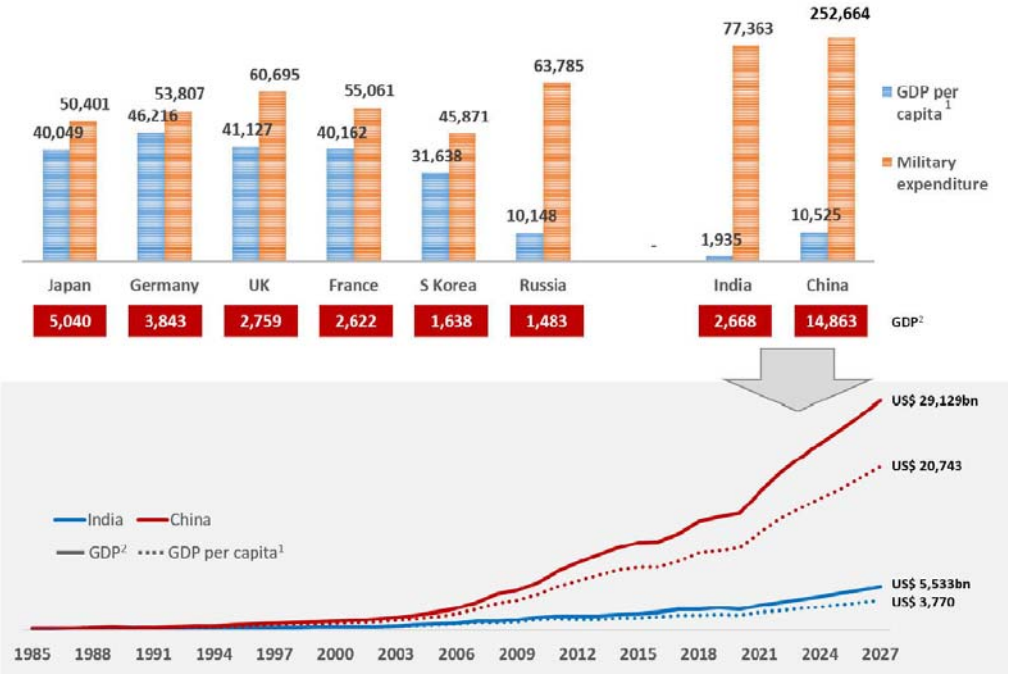
[33] Because of small demands of military applications technologies and components require smaller production runs. This requires large scale commercial of the shelf (COTS) applications equipment for military products to reduce its R&D costs by economies of scale. Examples: the US Army requirements for hand held communications and use of satellite surveillance and reconnaissance led to development of mobile phones and digital camera using space-based photography. The US Government, Defence Advanced Research Project Agency (DARPA) developed the internet communications which was required for optimum application of precision targeting combination of fire units over wide areas. Industrial Microchips were developed for cruise missiles and F 14s of the USAF; the US Navy needed development of system for location of its submarines and other assets at sea, which led to the GPS.

[34] The UN Register of Conventional Arms 1994 identified six destabilising major weapon systems, namely: naval combat ships; combat aircraft and helicopters; tanks and fighting vehicles; artillery and rocket projectors; and missiles for tactical and strategic applications.

[35] India is an anomalous situation: its GDP is the 5th highest in the World. Source https://worldpopulationreview.com/countries/countries-by-gdp However, in terms of India's per capita income in 2021 assessed at $2,191, it holds unenviable rank at 144th position out of 194 economies in terms of its per capita income. Sources https://statisticstimes.com/economy/country/india-gdp-per-capita.php.



Following examples explain correlation higher PCI with military effectiveness and firepower:

- India's decision to acquire 126 Rafael aircraft was based on the government issuing an Acceptance of Necessity (AON) to the IAF. However, due to competing demands because of India's low PCI levels, the Government reduced this AON and acquired only 36 aircraft.[36]
- A similar rationale is found in the UAE's purchase of 80 Rafael aircrafts. The decision was facilitated by UAEs higher PCI of 37,500 USD (18 times higher than that of India's), even though it's GDP of 358 bn USD is less than one eighth of India's GDP.[37]
- Another example of decision-making in a country with higher PCI, such as Germany's decision to acquire weapons and technology after the Russian offensive on Ukraine in February 2022. Within one month, Germany increased its defence budget to 102 bn USD. This was financially feasible, because of Germany's PCI is among the highest in the world (25 times higher than India's).

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[36] The IAF had a capability void between the performance of the LCA and its heavy weight air superiority fighter Sukhoi 30. An operational necessity was expressed for an aircraft with capabilities of long range bombing, electronic warfare, and to launch air to air BVR missiles. This operational void requires a medium weight multi role aircraft, which led the Cabinet Committee on Security to approve the IAFs original AON for 126 Rafaels aircraft. However, India could buy only 36 aircraft at USD 7.5 Bn, due to competing demands of poverty, gender inequity, public health and illiteracy etc. These important socio-economic considerations impose constraints on arms acquisition allocations and consequently military effectiveness. As a result, India continues to have an operational void due to shortage of funds for multi-role combat aircrafts.

[37] United Arab Emirates GDP per capita - 2022 Data see https://tradingeconomics.com › united-arab-emirate.

India's decision-makers need to note that simply increasing the GDP allocation to defence budget will make only perfunctory difference to its security sector's resilience. If country's security needs require reduction in its arms acquisition gap with that of its threats, for doing that, it has to enhance its PCI. The chart illustrates the growing gap between China's PCI and that of India's, enabling the former to acquire a higher scale of weapons and equipment.

Convergence of Military and Economic assets for Comprehensive Strategic power

3.2 Based on the criteria of scale, scope and innovative multiplier values: the paper examines five illustrations to understand options to enhance per capita income, such as: i) poverty eradication; ii) female labour force participation rates; iii) educational competitiveness for human factor productivity; iv) India's long-term energy development initiatives for competitive manufacturing; and v) capacities for advance technology exports.

To understand China's unprecedented economic growth, one needs to compare, the Chinese reforms 1978 with India's in 1991. The Chinese combined three factors of production: land, labour and manufacture of durable capital goods to focus on poverty eradication. To enhance its Female Labour Force Participation Rates (FLFPR) through range of initiatives from providing safety of Female workforce, training in appropriate skills in horticulture, non-farm agri-tech in rural sector and enhancing their educational standards China also gave boost to secondary and tertiary levels of education. Capacities were built to boost renewable solar power generation along with wind, nuclear, hydropower for very large-scale energy generation to reduce the costs of production was less due to economies of scale and increase the consumption of its manufactured goods for its large domestic market in China. Later this shifted to technology value-added exports.

The focus of India's economic reforms in 1991 was on liberalization of the economy to address India's immediate balance of payments problem; increase job opportunities; incentivise foreign direct investments; eliminate state monopolies and controls on industrial licensing; deregulate the industrial sector to boost manufacturing sector; make Central public sector units more competitive; to liberalise investment to boost private sector role in Information Technology exports. These reforms led to urban wealth creation. A trickle-down effect of this growth, which was expected to lift larger population out of poverty did not happen.[38] Three decades later, 60% wealth has got concentrated in the top 12% population, and 40% of national income is held with bottom 88% working classes. Without increase in consumption capacities of the largest segment of population, the demand for manufactured goods hasn't grown to India's potential, neither the retail market nor the service sector. The illustration shows income distortion has impaired India's per capita income and its GDP growth, restricting availability of public finance for investments and infrastructure, that's how 1991 reforms, resulted in jobless growth.

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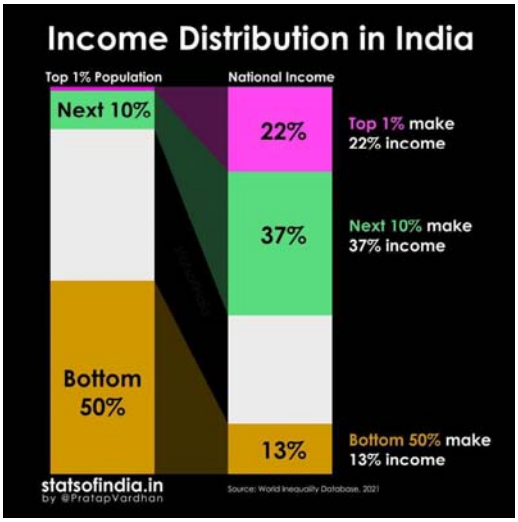
[38] Reliving Landmark 1991 Economic Reforms. https://www.thehindubusinessline.com. article35547510



Three decades later, with different policy emphasis laid by India, while China emphasised poverty eradication, Female Workforce Participation Rates (FLFPR) and compulsory education up to 9th Class, their comparative outcomes are evident in growth of their GDP and Per Capita incomes.[39] India is among the most unequal countries in the world with rising poverty and income gaps between the poor and the rich.[40] India's iniquitous growth has led FAO estimates that 70.5% of Indian population is unable to afford a healthy diet, which costs Rs 243 a day.[41] As population growth indicators are estimating India to have 1.54 billion in 2047, failure to implement sustainable agriculture and horticulture plans will seriously impair India's food security resilience. If Indian policy makers focus on poverty eradication, it would lead growth in consumption and retail market. In turn, it will create demands in India's manufacturing industry for: clothing; housing and construction; energy; transportation; household goods; food security; health and education sectors, which in turn will increase the size of service sector. Last 20 years data shows a low growth of Middle class as percentage of population[42] and evidence of post-1991 reforms reveals, a small impact on the growth in Middle Class India. Despite the vaunted claims of consumption capacity of India's growing middle class, the country's per capita income has remained a low growth. This is another indication of confirmatory bias in India's executive administration.

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[39] China GDP 1960-2022 Macro trends https://www.macrotrends.net/countries/CHN/china/gdp-gross-domestic-product and India GDP 1960-2022 Macro Trends https://www.macrotrends.net/countries/IND/india/gdp-gross-domestic-product

[40] World Inequality Report 2022: Lucas Chancel, Thomas Piketty, E. Saez and G. Zucman also informs deteriorating quality of official data.

[41] Govind Bhutada, "Mapped: 3 billion people cannot afford a healthy diet.'' The UN Food and Agriculture Organization (FAO) 2020, assessed healthy diet is one that meets daily energy needs and requirements of the food and the country's dietary guidelines. Affordability is estimated by comparing the cost of a healthy diet to income levels in the country. The diet is deemed unaffordable the cost exceeds 52% of an average household's income. https://elements.visualcapitalist.com/3-billion-people-cannot-afford-a-healthy-diet/

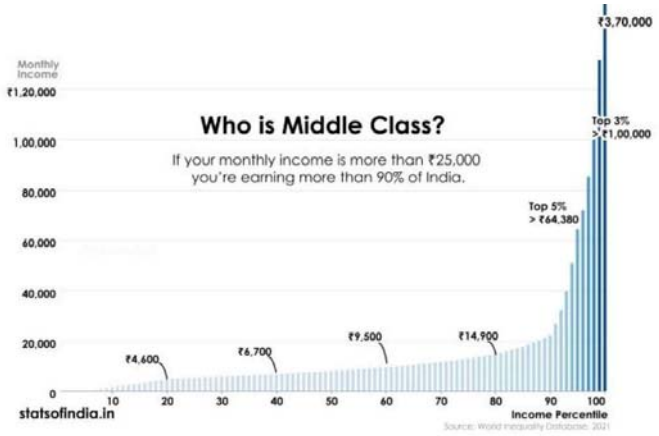
[42] Frome 2000 to 2018, the Indian middle class population grew from 1.2 % to 5.7%. In the same period, the Chinese middle class grew from 3.1 % to 50.7%. Thomas Lee, Lived Change Index shows China attach much more importance on politics of human development? https://www.quora.com/Why-does-China-attach-so-much-importance-on-politics/answer/Thomas-Lee 1181?ch=15&oid=319273660 &share=76e28922&srid= nX3wX&target_type=answer

No government in post-independence India has shown success in poverty eradication or enhancing country's low per capita income, which is currently ranked at 144 as evidence of limitations in India's public service implementation methods. Trained in traditional methods of revenue collection, India's administrative services continue with their colonial model of public service delivery. It has not built specialisations and remains ill-equipped to meet the challenges of the times ahead. As low Per Capita Income impairs spending on weapons and technology acquisition, India's planners need to identify these two policies as imperatives of national security resilience. There is a need to test different implementation options in a large country like India, one-size-fits-all method has not proven successful.

Five Socio-Economic-Industrial Sectors for India's National Security Resilience

Poverty Eradication

India as the World's largest Below Poverty Line (BPL) and poverty vulnerable population (PVP). It has 380 mn BPL population (daily earning less than two USD or Rs 4800 per month). India has 210 mn. PVP population (daily earning less than five USD or Rs 12000 per month) and India's average national per capita income is estimated at 2000 USD or Rs 16000 per month).[43] Data of World Inequality Database indicates the scale of poverty in India. It has remained neglected by successive Governments of India, evidenced by absence of dedicated poverty eradication programme. Continuing with a low Per Capita Income, it has brought us to a state of low National Security Resilience.



China's poverty eradication and skill development programme was launched in early to mid-1980s aimed to eradicate its 800 million poor population. Over the past three decades, China had invested 20 billion USD in its poverty eradication targeted programmes at Village levels and precision targeted programmes at Household levels. It had over the years, deployed 2.8 million trained staff for poverty eradication, out of

[43] The need is to identify for alternative solutions for diverse scale of poverty eradication, UNDP Multi-dimensional Poverty Index 2021: "Why raising income alone won't end Poverty", Times of India, Delhi, Oct. 13, 2021; "Hard to Count", but poverty in India is falling, Times of India, Delhi, 13 Oct 2021; Times of India, Delhi, 25 Nov 25, 2021; "Poverty in India is on the rise again", The Hindu, 4 Aug 2021; and "Alarming Hunger or statistical artifact?" The Hindu, 18 Oct 2021.

which 800,000 expert staff continue to live in villages.[44] At the current estimates, China has only 3% of its population below the poverty line.[45]

With colonial models of public administration with civil servants staffing various Whitehall-type ministries has demonstrated failure in eradicating poverty in India in the past 70 years. Consequently, there is a need to develop alternative methods of delivering poverty eradication objectives. It requires a poverty eradication national plan and an empowered at National Agency for Multidimensional Poverty Eradication and Development (NAMPED). This agency must assess barriers, limitations, opportunities and respond flexibly to causes of poverty and deprivation in different Tehsils and villages.

It would require India to train around 600,000 village level poverty assessors and master trainers for delivery of agri-tech skills required in the villages, at Agriculture Universities and specialised training colleges. The required skills should enhance farmer's enterprises in protected cultivation (PC) horticulture; fisheries; poultry; dairy parlours; solar power generation for operating farm machinery and food processing etc. to add towards farmers income through value added agri-businesses. The master trainers would need to set up pilot projects in each village for training at village schools. Targeted poverty eradication should focus on poor villages and precision eradication should target poor households.

Enhance Female Labour Force Participation Rate to best national averages.

How would female employment and women empowerment initiatives add value for national security resilience? It requires broader wisdom to span barriers in implemnting value addition to national security resilience through enhancement of Female Labour Force participation rates (FLFPR). It requires our cultural resistance to change in assessing barriers, limitations and opportunities in broadening the female work force participation as well as, equalising compensation levels of the male labour force. Basic question is how revenue generating vocations can add to female per capita income from a state level of 55% already achieved by Himachal Pradesh, from the current national levels of 19%. Incidentally the neighbouring state of Punjab has FLFPR of only 9 %. The challenge is to develop public understanding on the linkages between national security resilience and this underutilised asset of India's female labour force.

For example, challenging questions for implementing ways to enhance FLFPR in India *leads us to* McKinsey **2015 studies, where scholars** examine woman's work roles and the potential economic impact of advancing women's and gender equality measure at state levels. India's Female Empowerment Index (Femdex) for the leading states provide a useful indicator of what is achievable in three different parts of the country, namely: Mizoram 0.70; Kerala 0.67; and Himachal Pradesh 0.63, **a conservative North Indian state. It** has achieved the highest FLFPR of 55.7 %. It is estimated that full 60% participation for India could

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[44] China: What is Targeted and Precision Poverty Alleviation Part II? https://youtu.be/LFOkRykYAeg

[45] See Wang Sangui, Li Zhou, Ren Yanshun," The 8-7 National Poverty Reduction Program in China: The National Strategy and Its Impact" Institute of Agricultural Economics Chinese Academy of Agricultural Sciences 12 South Zhongguancun Street, Beijing 100081, P. R. China

potentially add 2.9 Trn. USD to its economy in 2025.[46] Another Mckinsey study 2018, estimates **that an increase in 10 percentage points of FLFPR, will have multiplier effects on the Indian economy which could potentially add $770 billion to India's GDP by 2025.**[47]

Educational development for economic and human factor productivity

In the decade of 1950s, China, South Korea and India were at similar levels of education standards. As early as 1960s-1970, China emphasized a policy of nine years of compulsory schooling and started with elementary schools in every village; junior high school in every township, and senior high schools in every commune. In 1960s, China gave priority to removing illiteracy and ensuring universal compulsory school education, thereby created huge educated work force that helped in industrial reforms of the 1978.[48] In this period, India emphasized higher education in its elite engineering institutions like the IITs. India introduced free compulsory education, in the shape of Right to Education only in 2009. By mid-1980s, China had achieved Gross Enrolment Ratio of 100%. By 2018, India's literacy rate was at 74%, whereas China by this time, had already achieved 96.8% literacy rate.[49] It must be noted that literacy measurement standards of the two countries also use different yardsticks.

Impact of China's education-linked productivity can be studied in different sectors. An assessment of value addition of education to the workforce productivity in national agriculture sectors can be assessed from inputs-output comparisons of China and India. Even though India has more arable land than China, buts its annual per capita output and per acre yield of staple grains, wheat or rice continues to lag behind that of China's: [50]

- Workforce to Agri-yield ratios: Indian population engaged in agriculture is 42%, and output is approximately 300 bn USD, or 19% share in its 2.7 trn economy. China's population engaged in agriculture is 8%, and output is 900 bn USD or 7.9% share in its USD 10.5 trn economy.
- Agriculture Yields In 2020 Wheat yield: China was 2.4 bn tons and India's was 1.8 bn tons. In 2019 Rice yield: China 211.4 mn tons India 177.6 mn tons. In 2017 per capita annual consumption of

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[46] Ashwini Deshpande, Ashoka University, The Mckinsey Global Institute, "Power of Parity: Advancing Women's Equality in India, Nov 2015, P.2. The question for arms acquisition experts: if the gap of 35 percentage points between the FLFPR of Himachal Pradesh and India is bridged, the country could add annually 2.7 Trillion USD to its GDP. If the Government pegs defence budget at 2.5% of GDP, can it putatively allocate additional 72.5 bn. USD to its annual budget for acquisition of 18 squadrons of Rafaels?

[47] Jonathan Woetzel, et al The Power of Parity: Advancing Women's Equality in Asia Pacific McKinsey Global Institute, April 23, 2018: p. 99.

[48] Cai Lei, "Did Mao Industrialize China" https://www.quora.com/Did-Mao-industrialize-China/answer/CaiLei 2?ch=15&oid=382389532&share=e34cbfca&srid= nX3wX&target_type=answer

[49] Naveen Kumar and Vinitha Varghese, "China has 20-year edge. The question is can NEP help India improve education quality, UN University paper" https://theprint.in/india/ education/china-has-20-year-edge-but-nep-can-help-india-improve-education-quality-un-university-paper/1030680/ and Adult literacy in China 1982-2018 see Statista: https://www.statista.com › Society, Education & Science. World Bank defined literacy as people aged 15 and above who can read and write.

[50] Janus Dongye Qimeng, "Does China produce enough food to feed its populace or does it have to import food?" https://www.quora.com/Does-China-produce-enough-food-to-feed-its-populace-or-does-it-have-to-import-food/answer/Janus-Dongye-Qimeng?ch=10&oid=132745322&share=d02f67e3&srid=h0lwZ&target_type=answer , data extracted from Statista: China GDP and India GDP, FAOSTAT, Virtual Capital, Helgi Library and Govt of India Ministry of Statistics and Programme Implementation.

vegetables in India was 81 kg and China was 324 kg. China has successfully adoption of modern horticulture technologies such as green houses and hydroponics.

- China invested 5.6 times the amount spent by India in 2018 on agri-R&D and Agriculture Knowledge and Innovation System (AKIS). An impact assessment study of investment and subsidies on agriculture GDP growth and poverty alleviation, revealed that the highest impact is from agriculture Research and Education (R&E). Indian agriculture experts have also advocate learning from China's agriculture research and education systems.[51]

- Four examples illustrate contribution of rural high school level education in China has made to success of its agriculture sector reforms.[52] These include: i) Agriculture Price Reforms provided incentives for farmer's choices which resulted in 47% increasing in agricultural output. ii) Productivity Growth Reforms aimed at improving per hectare productivity in the farm sector; iii) Market Liberalisation Reforms gave strong incentives to farmers to adopt new technologies; iv) Agriculture Research and Education Delivery Reforms to develop rural non-agriculture farm (RNF) skills. The relative efficiency of these reforms was laid by growth in secondary education in the rural sector which in turn led to growth in China's agriculture productivity.

- Along with dedicated poverty eradication programme launched by China in mid-1980s, rural education and RNF skills building enhanced its female labour force participation rates to around 65%, that led to China's rapid growth after 1990. The RNF skill-building provided additional income outside farming; improved farm productivity; lifted rural labour and marginal farmers out of poverty; reduced the demand on subsidies; improved drip irrigation and solar power consumption.

- To increase spending on Agriculture Research and Education (R&E), required overcoming a major barrier of rural education levels in India's growth of agriculture R&E knowledge for application at farm levels. The lack of rural sector education in India continues as a barrier to growth in our rural non-farming and agricultural sector GDP is shown by trajectories of growth in the agriculture production corresponds with GDP growth in China and India is traced over six decades of failure in the charts below.[53]

- The evidence is clear that: growth in per capita income and national security resilience is dependent of growth in agriculture R&E knowledge and investments rural technologies in India.

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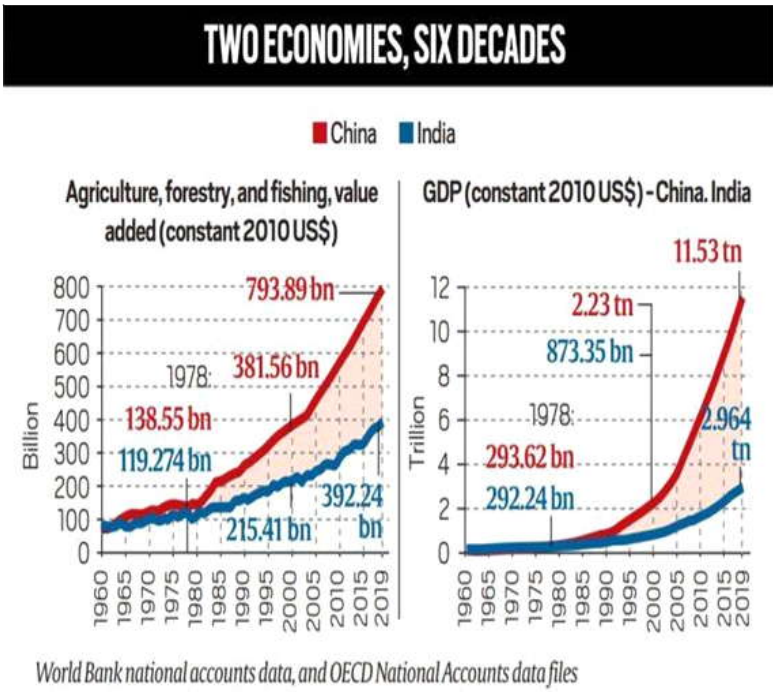
[51] Gulati Ashok and Shakshi Gupta, "India Can learn Lessons from China " https://www.financialexpress.com/opinion/india-can-learn-agri-policy-lessons-from-china/1748398/ Financial Express, 29 Oct 2019. The study estimated that for every rupee invested in agri-R&E, GDP increases by '11.2, and for every million rupees spent on agri-R&E, 328 people are brought out of poverty.

[52] Ritesh Jain, "How China's 'Real' Economy Beats India In Wealth Creation," Outlook India, 27 Jan 2022https://www.google.com/search?q=Ritesh+Jain%2C+%E2%80%9CHow+China%27s+%27Real% 27+Economy+Beats+India+In+Wealth+Creation&oq=Ritesh+Jain%2C+%E2%80%9CHow+China%27s+%27Real%27 +Economy+Beats+India+In+Wealth+ Creation&aqs=chrome..69i57j35i39.12399j0j 4&sourceid=chrome &ie=UTF-8

[53] Agriculture Reforms in India and China: Comparative Analysis March 2021 https://samjhao.com/UPSC/agriculture-reforms-in-india-and-china-comparative-analysis.



Even though the State governments in India had launched rural development programmes, but their effort is marked by indifference. The reasons for rural poverty in India is the Government's failure in creating dedicated methods of delivery of four services: i) rural education; ii) delivery of RNF skills and agri-R&D; iii) multi-dimensional poverty eradication; and iv) initiatives to enhance Female Labour Force Participation Rates (FLFPR) in Villages.

Practical initiatives are required, for example: a 15-year programme for rural secondary education can use 6 million college graduates as school teachers. As paid volunteers to teach at village schools for one year on completion of their college graduation and vocationally trained to help on multi-dimensional poverty eradication programme.

As rural education and agriculture R&E are among the factors that led to China's agriculture growth and success in rural non-farm economy, India's leaders need to realise that India's per acre yields of major crops paddy, wheat, grains and pulses continues to be less than that of China, Bangladesh and Myanmar. Yet the Minister states that there is no slowdown in agriculture research activity, but misses the major point of limitations remain in the Government's inability to develop its delivery mechanism for agriculture R&E to farmers.[54]

[54] See "India's Paddy, Wheat productivity lower than China's" see Business Standard 22 March 2013. Authors meetings with Haryana Agriculture Minister Shri OP Dhankar 18 May 2015, Agriculture University, Hissar, and research on agriculture R&E services delivery with IARI Scientists at Aggrinnovate Centre and Centre for Protected Cultivation, Pusa Institute 2016 to 2020.

Clearly the preparation for national security resilience in India starts with re-designed implementation of rural education, agriculture R&E, RNF and FLFPR skills to enhance agriculture productivity and rural economy.

Examples of South Korea's educational policy and planning of 1970s-1980s are noteworthy, a country which had started from a lower per capita income base is now a member of OECD. Its priorities to invest in education have facilitated its technological competitiveness:

- One, it aimed at universalising secondary level education. By 2019 nearly 50% of its adult population (between 25 to 64 years) had achieved Tertiary education levels.[55] In 25 years, from 1980s to 2005, South Korea made five-fold increase in its Gross Enrolment Ratio (GER) for tertiary education.
- Two, in 1980s the South Korean government began to strategically invest in human capital development through STEM education, research and technological innovation. With estimated outturn of two third graduates were in STEM subjects.
- As a result of these policy directions and achievements, South Korea achieved phenomenal economic and technology growth.
- A Nikkei study identified ten fields of emerging technologies that are being competitively commercialized. Country rankings describe their comparative standards in these selected fields of emerging technologies. While China leads in the nine technology fields, South Korea ranks among the top three in nine fields:[56]

1. Artificial Intelligence: China; USA; S. Korea; Japan; Germany.
2. Quantum Computing: USA; China; Canada; Japan; Ireland
3. Regenerative Medicine: China; USA; S. Korea; Japan; Switzerland
4. Autonomous Driving: China; USA; Japan; S. Korea; Germany.
5. Block Chain: China; USA; S. Korea; Japan; Germany.
6. Cyber Security: China; USA; S. Korea; Japan; Israel.
7. Virtual Reality: China; USA; S. Korea; Japan; Germany
8. Lithium ion Batteries: China; Japan; S. Korea; USA; Germany.

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55 L. Yoon, Education level of adult population South Korea 2019" Statista April 14, 2022. Deepti Mani and Stefan Trines, "Education in South Korea" Oct 16, 2018.

56 See Nikkei study 2017 https://qph.fs.quoracdn.net/main-qimg-a34bddea8f26d62ee49fb4b68c6d5ec0-lq Machine Intelligence, Artificial Intelligence, Data Analytics, Machine Learning, Deep Learning, and Predictive Analytics are techniques that could radically change our world. Two new developments from China are: "Zuchongzhi 2.1," is 10 million times faster than the current fastest supercomputer and its calculation complexity is more than 1 million times higher than Google's Sycamore processor. China has reached quantum septillion times faster than the world's fastest existing supercomputer. IBM has created the world's largest superconducting quantum computer as of 2021. According to the Xinhua News Agency, China is developing new light-based quantum computer prototype, "Jiuzhang 2.0," with advantage in a superconducting quantum computing system.

9. Drones: China; USA; S. Korea; Japan; Netherlands

10. Conductive Polymers: China; Japan; S. Korea; USA; Germany.

What should political leaders do in countries that are technology followers and want to catch up in these fields? ####

There is a need build specialized educational facilities in R&D on emerging technologies to reach competitive international standards. For example, since mid-2000, trends in Information Technologies developments indicate an exponential global growth and information diffusion developed from analog to globally connected data, media and info-graphics. For the first time in human history, huge amount of data is becoming open source and available to anyone. Societies with large science-based manpower with STEM education will be able to deploy benefits from this information explosion to innovate for new growth opportunities provided by connected data.

As digital transformation picks up pace, demands for different types of digitally connected workers: operators, engineers, executives in the field, working from remote locations will drive this growth? The Digitally Connected work force will reduce human errors; increase productivity; enable efficiencies of time and costs; improve safety standards of workers; enhance decision-making, and 24x7 work monitoring in sectors such as: oil & gas; quality control in industrial and vehicles manufacturing; construction; chemical production; mining and metals; air and seaports; telecommunication and power utilities etc.[57]

As emerging field information driven digital technology revolution, no economic activity or information warfare will remain untouched by this new technological competition, both industrial and military. New technologies would enhance worker productivity through data and AI controlled processes; smart sensors; Internet of Things (IoT); and cloud computing.[58] New market opportunities would enable interaction between the manufacturers and customers. To increase their competitiveness, countries will have to facilitate trans-border regulatory data protection and privacy compliance across the global markets.[59]

Among the challenges that India's tertiary education policy face are how digital transformation will improve productivity and unlock new efficiencies by training and deploying "Connected Workers" in the next three decades? If demands for skills in digital expertise remain unmet by India, it will impact a country's performance, export earnings and per capita productivity.[60] Therefore, country's tertiary education policy has to create digitally connected knowledge workers of the future. Whereas, India's new education

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[57] Jeff Desjardins, "History of computer science applications and Evolution of Media: https://www.visualcapitalist.com/history-computer-science-one-infographic/; June 2018. See Jeff Desjardins, https://www.visualcapitalist.com/evolution-of-media-data-future/ July 7, 2022.

[58] See Nick Routley, 5 Mega Trends Fuelling The Rise of Data Storytelling, https://www.visualcapitalist.com/data-storytelling-megatrends-infographic/ July 5, 2022.

[59] The EU President, Ursala Van Leyden at Raisina Dialogue April 2022, emphasized the need for India to develop data privacy laws and data protection standards to be harmonized with EU, as these countries are complying with European Data Privacy Regulations. However, the law in India is still in the process of debate. See "Where is the Law" Times of India, 2 Aug 2022, p. 22. Data Privacy Law in India is expected soon says Ministry of Communications, Times of India, 20 Sept.2022.

[60] Katie Jones, op.cit Note 37. Katie Jones, Connected Workers: How Digital Transformation is shaping Industry's Future? https://www.visualcapitalist.com/connected-workers-digital-transformation-future/ Virtual Capitalist July 2020

policy 2022 is silent on this assessment. Does it reveal limitations in our policy making, implementation emerging realities?

Unless India makes large scale investments in STEM education, financial accounting and technology management, it will be wishful to expect higher returns on investments in digital and informational economy in decades to come. As per 2016 estimates, the global out turn of STEM graduates was the highest in China: 4.7mn, followed by India's output: 2.6 mn.[61] An assessment of quality of this out turn can be identified by international rankings in technology innovation. Views of a leading Aerospace and Defence manufacturer working in India needs to be noted: "there is a long way to go to improve the quality of technological education of the workforce in India."[62]

India's political leaders must not repeat failures of the 1960s, and a lackadaisical education policy. For a country like India with its huge baggage of illiteracy, low levels of secondary education, there is need to think of alternative policy delivery and implementation methods, such as special purpose implementation vehicles (SPIV) instead of relying on colonial era models of delivering educational services. Our repeated policy failures will affect not only national productivity, but India's national security as well.

Developing India's Advanced Technology Exports Capability

What should be India's Long-term objectives of advanced technology capacity building and why? How should development of advanced technologies for military applications integrate with advanced technologies for export markets? China's is competing with the U.S., Japan and other advanced technology global supply chains. It's export competitiveness and domestic consumption in the 25 key advanced technologies, seeks markets for both military and commercial applications. India needs to implement methods that span China's pursuit of advanced technology R&D, and stay competitive?

Seventeen advanced technologies were identified on the basis of global investments in their military applications. Considering the costs of development, a low scale of military demands and rapid obsolescence in military applications, these technologies were found to have wider applications in sectors such as: communications, health, transport, energy, precision manufacture and information technology. Ubiquitous usage of advanced technologies for commercial applications needs to be developed for export markets to reduce costs and risks of R&D; enable economies of scale; sustain competitive and innovative technology standards; and global marketability. It requires India to develop an advance technology R&D exports capacity building strategy, facilitated by entrepreneurial finance to invest in both the domestic and export markets. The 17 advance technology fields and some of their commercial applications include:[63]

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61 Which Country is technologically more advanced? https://www.quora.com/Which-country-is-technologically-more-advanced-China-or-Japan

62 David Zeigler VP, Dassault Systemes, "Technology skilling vital for aerospace and defence sectors", The Hindu, 2 January 2021.

63 For a detailed discussion of these technological fields and their applications, see "Preparing for our Future: Developing a Common Strategy for Key Enabling Technologies," EU Commission Staff Working Document SEC(2009) 1257, September 30, 2009; and Ravinder Pal Singh, "Identifying Key Technologies in Major Weapon Systems," in The Transfer of Sensitive Technologies and the Future of Control Regimes, (New York and Geneva: United Nations Institute for Disarmament Research, 1997). Ravinder Pal Singh, Building Advanced Defence technology Capacities in Carnegie Study "Getting India Back on Track" Random Publishers, 2014

1. Air-Breathing Propulsion: Aerospace, UAVs, aircraft power generation.
2. Rapid Prototyping and 3D printing: manufacturing, industrial design, housing and construction, machine tools and health sectors;
3. Semiconductors and Microelectronic Circuits: Automobiles, telecommunications, computer industries, and industrial robotics.
4. Passive Sensors Firefighting; health care; pollution control; engine diagnostic tools; mining; industrial and chemical safety monitoring and satellite-based imaging, communications, weather forecasting and environment measurements.
5. Composites and Nanotechnology Materials Aerospace, wind power, development of environment friendly materials, fisheries, transport and construction.
6. Signal Processing Neural network applications, security surveillance, medical diagnostics, and automatic machine tools.
7. Simulation and Modelling Undersea geophysics and prospecting, petroleum exploration, virtual prototyping, and simultaneous design and manufacturing-phase engineering. ecological sensitivity measurements.
8. Advanced Software Air traffic control, ship design and construction, deep-sea mining, health care, computer security and cryptography, electrical power generation, and surface transport. Radar
9. Artificial Intelligence and Robotics: automated manufacturing, health management, traffic safety, and remote detection of chemical effluents, financial and banking sectors, smart cities; Industrial robotics: hazardous material handling, automated manufacturing, deep-sea exploration.
10. Parallel Computer Architecture Computer-aided design, engineering simulation, weather forecasting, petroleum and electronics research.
11. Quantum Communications & Photonics Encryption in Financial sector, Banking, E commerce, Medical diagnostics, high-speed computing, laser detectors, local area networks, and transoceanic cabling.
12. Computational Fluid Dynamics Aerospace; welding and soldering; and production of silicon wafers, circuit boards, machine tools, and gas turbine parts.
13. Data Fusion Public Administration, Urban planning; pollution control monitoring; climate, crop, and geological analysis.
14. Weapon System Environment Pollution control; weather forecasting; and oceanographic, space, and geological research.
15. Pulsed Power Electricity production and advanced medical equipment.
16. Hypervelocity Projectiles Commercial space launch vehicles.

17. Superconductivity Energy distribution, non-invasive diagnostic surgery, magnetic resonance imaging, and high-performance computing.

Among the limitations of building up national advanced technology R&D capacities are:

- First, a shortage of trained and experienced manpower for carrying out advanced R&D projects from the stages of concept definition, design, development, production, and independent verification;
- Second, lack of advanced technology infrastructure of international quality control standards for R&D testing, trials and market incubation and;
- Third, limited access to entrepreneurial finance and institutionalized system of convergences to support R&D with their attendant costs and risks of failure.
- Fourth, limitations in technology innovation standards to access to competitive international markets in the OECD countries. ###

If India were to compete with China in terms of R&Ds in advanced technology sector, then instead of making rhetorical claims as and when a new product is made, there is a need to carry out a comparative assessment of limitations across wider fields such as: scale of manpower with research abilities in advanced technologies; scale of innovation and patents; value of technology exports in OECD markets; identify capability gaps and policy reasons that has enabled China's comparative success. For example, if policy needs a focus on ways to develop high quality of manpower training for advanced technology R&D, both in terms of scale and standards required, China has not only increased research outputs from its own universities, but launched initiatives for 'brain gain'. It has been able to motivate highly qualified, talented and experienced engineers researching in the US and West Europe from diverse specialisations by offering R&D facilities that match international standards. A Chinese Returnees (CR) programme was launched to attract overseas Chinese working in Artificial Intelligence, information technology, telecommunications, aerospace and biotechnology through research grants and R&D support. Increasing number of CRs are now making significant contributions to China's academic and R&D in the Chinese Academy of Sciences; Chinese Engineering Academy, and at over 110 R&D Entrepreneurial Parks and 8000 start-ups. China's Silicon Valley has set up 4500 Technological ventures.

Chinese students with Ph.D. degrees from U.S. universities were earlier inclined to stay back, resulting in long-term brain drain. In the past decade, policy changes led to increase in Chinese researchers returning from developed countries, thus boosting China's global scientific knowledge exchange. For every 10 Chinese students studying abroad, there are 9 students returning home.[64] To understand the policy differences, comparable schemes in India need to be investigated to identify and select advanced technology fields, their R&D manpower standards and availability.[65]

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[64] Ritesh Jain op cit.

[65] Rup Narayan Das, 'Engaging the Diaspora: Experiences of India and China' IIC Quarterly Autumn 2021 pp. 123-124. Ramalingaswami Re-entry Fellowship offered by Ministry of S&T for disciplines like biotechnology, agriculture, health sciences, energy and environment, etc

What could be done to build India's R&D advanced technology capability?

The Consortium should focus on advanced technology R&D and manufacturing capacities for products or components for spin-on to be used for India's technology requirements.

To create Eco system of the aforementioned advanced technologies, create a Consortium of R&D clusters in these 17 advanced technologies needs to be developed with R&D manpower streaming from the IITs and colleges of engineering research. These clusters should be integrated with Centres for Excellence (CoE) for testing and quality control: with access to defence and commercial products for international and domestic markets through R&D spin ons and spin offs integrated with manufacturing hubs of precision engineering units, start-ups, incubation labs and Intellectual Property Rights (IPR) firms. The CoE should institutionalise access to entrepreneurial finance for venture capital (VC), private equity (PE), Angel investors and banks with technology focus; and support R&D costs and risks with offsets obligations.

A country's technological resilience is reflected in its technology export earnings and innovations in the emerging technology fields in both industrial and military applications. In the Global Technology Innovation Index rankings, China is among the top 25 ranking countries, while India holds 66th rank.[66] In this regard, Indian policy makers could take the following initiatives:

- In the Consortiums of Advance Technologies, in each field of create the CoE need to have Technology Innovation Centres (TIC) for collaborations with countries with higher innovation standards.[67] The TICs should be local contact points for international technology innovations experiences, to spread these practices, among the members of the Consortium members and defence industries in the country.

- Political bi-partisan support is required to build long term advanced technology policies and plans based on market principles for convergence of commercial and military export markets. An independent performance audit should regularly assess commercial sustainability and international competitiveness of India's advanced technology eco-system; assess barriers and limitations in exporting to technology markets in the OECD countries; and opportunities to build joint R&D collaborations between the international developers and Indian start-ups?

- It is time that India takes serious initiatives to broaden the scale of its research output from the academia in the aforementioned fields to increase its R&D manpower base. It would require output of several thousands of scientists and engineers trained to research in these advanced technology fields. It is important to attract highly qualified and experienced overseas Indians and international experts specialising in R&D engineering research in these fields.

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66 Wipo INSEAD CornellGlobal Innovation Index.pdf Box 4 pp. 19, 20, 21.

67 Technology Innovation Centers should develop policy and decision-making training programmes for political leaders, Government and business executives in areas such as: tertiary education development for advanced R&D; technology business regulatory environment; technology knowledge creation and diffusion and innovation; sustainability of financial credit, investments for technology trade and competition; business and market sophistication; industrial design standards for High technology exports; Creating technology goods and services for international markets, etc.

- In the current India's R&D system, foreign companies holding propriety R&D rights, seek Joint Ventures in India to access the large-sized Indian market. Unless India-based R&D entreprises, develop partnerships with global R&D companies for market access, Indian R&D will not come of age to sustain competitive defence technologies.
- Indian companies who join projects in the advanced technology consortium could begin with developing and specialising in advanced technology components or assemblies for global supply chains and build experience in technology trade and markets. After developing this competence and capabilities, the Indian companies would be in a better position to graduate to the stages of developing joint ventures for manufacturing complete products.
- India's public sector technology R&D labs have to overcome limitations of state monopoly and control on combat systems R&D, such as: 'Triple Hatted' control of R&D projects and funds that limits competition and innovation. Monopoly control exercised by the DRDO's DG, Secretary R&D and Scientific Advisor (SA) being the same person. The current Defence R&D system is a monopoly by controlling allocation of MoDs R&D funds. It deters private enterprise; reduces oversight, monitoring and scrutiny of technology outcomes; reduces incentives for creating leapfrog technologies; preference of the MoDs R&D bureaucracy is to work with the assured Indian military market rather than venture into international competition. India's defence R&D model undermines competitive alternatives; lacks in long term financial planning to converge military's threat assessment with technology development plans. As the model does not provide a predictable funding model for the R&D projects, it is difficult to develop commercial investment opportunities thus inhibiting barriers for VC or Angel investors to enter military R&D labs.[68]

Developing India's Energy Sector

The goals set by the Indian Government for replacing fossil-fuel based energy by renewable energy aims to generate 500 GW of non-fossil fuel capacity by 2030. Its revised guidelines that incentivises thermal generation companies to provide renewable energy generation capacity, under the existing Power Purchase Agreements. As the costs of renewable energy generation is less than that of thermal energy, it provides gains sharing incentives between the power generator and distribution companies by bundling these two energy sources.[69] With increasing commercialization of renewable energy technologies, the cost of solar power in India is nearly half of the cost of electricity from nuclear power plant.

India has achieved the targets of its installed solar capacity of 50 GW in February 2022. It now aims to triple its renewable energy capacity from installed 157 GW in 2022 to 500 GW by 2030, of which 60

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[68] Reasons for lack of investments by the private sector in defence R&D discussions with former Defence Secretary 14th June 2022.

[69] Ministry of Power: Mission 500 GW by 2030, "India takes one more step to reduce carbon emission and reduce the cost of power to consumer." See post of Press Information Bureau, Delhi, 16 Nov 2021

per cent will be from solar power.[70] An investment of 225-250 billion USD would require to meet this target. Without focussed government support for technological development, it will be very difficult to match China's energy production levels. India needs to span the solar energy production and consumption gap with China, the only country similar in demographic scale, in 2020 per capita consumption in China was 28072 Kwh, India was less than one fourth at 6438 Kwh.[71]

India's limitations in increasing its solar power generation capacity is dependency on import of critical raw materials like lithium, cobalt, and nickel used for the production of solar panels and other renewable technologies. China controls 75% of World share of solar panel manufacturing and its demand is increasing by 36.4%. whereas, India share is only 7%. The government needs to find answers to building up India's share of global solar panel manufacturing capacity is at 1.3%, whereas China's share has been raised to 84%.[72]

China wants to reach its climate targets by 2060 as set in the Paris Agreement, with 80% of its electricity coming from Carbon free sources. It is therefore scaling up its capacities for mega production not only for itself, but to create a sufficient scale of production for several other countries to become dependent on supply from the Chinese sources. As China aims to develop 75% of global supply renewable energy equipment: solar panels, solar turbines, EV batteries etc, it is buying up most of the related raw materials to dominate the global supply chain. Investments in nuclear energy are seen as stabilizing mix of energy sources, for which China wants to build 150 nuclear reactors.[73]

There is a need to examine safety, scalability and economics of small modular reactors (SMR), and development for Hydrogen clean energy technologies is emerging new challenge, which requires Indian R&D in the public and private sector, to prevent a situation of being left behind.[74]

Summary of Arguments

While a state can purchase advanced technologies from the other states, only developed economies with higher Per Capita Income and high-quality engineering R&D skills can develop benefits from advanced technologies. This requires a large and well-trained R&D work force to innovate and adapt commercial products to the requirements of the military.

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[70] See Bharath Jairaj and Niharika Tagotra, "India's solar capacities: Milestones and challenges", The Hindu 15 March 2022https://www.thehindu.com/sci-tech/energy-and-environment/indias-solar-capacity-milestones-and-challenges/article65227709.ece and Moody's report: https://economictimes.indiatimes.com/industry/renewables/india-needs-225-250-bn-investment-to-meet-its-2030-renewable-energy-targetmoodys/articleshow/92173747.cms?utm_source=contentofinterest&utm_medium=text&utm_campaign=cppst

[71] Govind Bhutada, "Mapping per Capita Energy Consumption", Virtual Capitalist; https://elements.visualcapitalist.com/energy-consumption-percapita/?utm_source=VC+Elements&utm_ campaign=48c0e571da-VCE_Email_September_13&utm_medium=email&utm _term= 0_f3fdb4328c-48c0e571da-46036025 June 28, 2022.

[72] "Who Controls the Solar Panel Supply Chain," Virtual Capitalist https://elements.visualcapitalist.com/chinas-dominance-solar-panel-supply-chain/) August 30, 2022.

[73] How China Plans to Win the Future of Energy https://youtu.be/b1LQSezKxnA

[74] Hydrogen: Energy Security and Energy Transition Integrator | WGS2022 https://youtu.be/GX5-TXYi1zY

India's security analysts are primarily focussed on allocations from India's GDP to military sector as an indicator of military power for buying more carriers, submarines or 5th generation aircraft, assuming these systems power national security. In a limited sense they power only military capability, but not sustainable national security resilience. India's strategic community needs to understand implications of large imbalance between India's per capita income and its military expenditures[75] which impairs India to sustain a grinding, protracted conflict. India for the past seven decades has been compelled to seek politico-security dependency of major powers, which in turn deprives its strategic autonomy.

To develop a country's strategic autonomy, it is important to understand the dynamics of per capita income and National Security Resilience. It is erroneous to be fixated by simple metrics of GDP allocations to defence sector. Indian analysts need create a multi-dimensional composite index that is based score of the following factors:

A) Assuming the size of country's GDP to understand the scale of economy correlates to its military power is intellectual misconception. As GDP is calculated on basis of aggregation of goods and services in a year, economists have recommend that each country needs to create its own dashboard of numbers that would convey essential priorities of its society and economy to help policy makers and economist to pay attention not only to material wealth, but to accurate needs of health, education, environment, welfare, social equity, governance, internal and economic security, and other indicators of the quality of life.[76] This requires Security experts, economists and sociologists in India to design and develop a customised dashboard based on assessment of the country's socio-economic priorities, costs and threats, and their management through military and/or diplomatic means to arrive at scientific assessment of defence budget needs for national security resilience.

B) Per capita income constrains arms acquisition decisions in any country. As poverty impacts India's 45% of its population, and another 43% are just keeping their head above water, unless this fundamental limitation is addressed, financials will remain a constant constraint on India's military resilience. India's public discourse and security policy makers need to re-formulate thinking on selected socio-economic sector as imperative to build national security resilience.

C) To increase Female Work Force Participation Rate for National Security Resilience will require stringent application of gender safety laws, women work place compensation and empowerment initiatives. Some states in India have already reached the desired levels.

D) Should India be unable fail to address its education deficit, this limitation will hobble its productivity in all sectors of India's economy in decades to come.

   i) Teaching and financial resources for rural sector secondary level school education need to be developed through innovative special purpose implementation vehicle (SPIV). By hiring college

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[75] Comparative China India Chart on Defence Budgets and Per Capita Income, Page 9.

[76] Stiglitz, Joseph op. cit. Amartya Sen, Jean-Paul Fitoussi, "Mis-measuring Our Lives: Why GDP Doesn't Add Up," New Press, 2010.

graduates for one year, to teach up to Class 10th students. By using fresh graduates every year, it would be feasible to have cost-efficient teaching resource in rural schools.

ii) Tertiary level educational standards in STEM subjects will build capabilities to meet the future needs of a large skilled work force in its manufacturing sectors, as well as deploy trained manpower to operate and maintain sophisticated weapons and logistic systems.

E) By exporting advanced technology R&D commercially to OECD countries, it will improve sophistication and quality standards of domestic R&D. It should enable India to potentially convert domestic industrial R&D for military applications.

F) Growth in per capita energy consumption and revenue competitive costs of energy production will add value to the manufacturing sector, which can help growth in industrial production that is convertible resilience in military's operational logistics.

From the 1950s to 1990s, a power asymmetry between China and India was manageable. However, for the past 30 years, China's growth has created a yawning power gap with India. We can either continue with our traditional gradualist approach, as during the 25 years period 1950-75. The past 30 years China's economic performance has gone up by well over five times.[77] India's economic liberalisation led to wealth generation for narrow base, rather than building income of the lower 50% of India's population, which impairs building retail market. If Indian public and political opinion is enamoured by high wealth achievers, our limitations in broad based economic resilience will show up in our security sector limitations. By continuing a conventional gradualist policy to economic development, the growing asymmetry with China in terms of military, industrial and economic resilience will show greater gaps and vulnerabilities in India's security capabilities in the next 25 years.

While military's interpretation of deterrence strategies is on readiness and firepower capabilities for the defence of the LAC; dominate the India Ocean; and operate along with nations that want to deter China's aggressive behaviour.[78] This approach has inadequate value in terms of strategic deterrence, because it is limited to local quid pro quo operations.

Unless India's security calculus re-prioritizes deterrence in terms of national resilience capacities, its human resource productivity for economic, industrial, financial and technological competitiveness to sustain long-term protracted conflicts on its steam, the country's notions of its strategic autonomy is all smoke and

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77 David Morawetz, Twenty Five years of Economic Development, 1950-1975, International Bank for Reconstruction and Development, The World Bank , Washington DC 1977 p. 15. In this 25 year period, China's PCI average growth rate was 4.2% and its global economic ranking went up from 62 to 47, whereas, India's PCI average growth rate was 1.5% and its global economic ranking remained at 66.

78 "Strategic surveillance would enable early warning for deployment at LAC to check ingress, while resorting to quid pro quo operations, as during the Depsang intrusion in 2013," Lt. Gen. KT Parnaik, former Northern Army Commander to Indian Express in July 2020. See Sushant "Out of Control", The Caravan, Oct 2022 p 9. Author's discussions with Gen Vinod Bhatia, formerly DGMO on 6 Nov 2021.

mirrors? That is why India swings between dependency on Soviets or Russians since the 1960s and now on the Quad. Critical political decisions are defining moments that mark rise and fall of nations. One such decision is to initiate national security resilience capacity building.

Indian leadership had faltered in this regard during the 1950s, and again in 1991. If the current political leadership falters again in 2023, then it provides evidence of a recurrent political handicap in implementing long term objectives. If India were to change its destiny vis. a vis. the challenges in the 21st century, then it has to implement policies and processes that will enhance its per capita income for national security resilience.

Recommendations

Given the significant influence of PCI growth on building NSR capacities, the evidence since 1990s informs that India's PCI growth trajectory was linear, whereas China's PCI trajectory grew exponentially from the same levels.

1. There is a need to accelerate our growth in selected high impact socio-economic sectors to raise NSR outcomes: i) Poverty eradication; ii) FLFPR; iii) Education; iv) Renewable energy generation; and v) Advanced technology export competitiveness. These sectors should be identified as imperatives for NSR capacity building. Special Purpose Implementation Vehicles (SPIVs) will need to have specialist staff to implement objectives with specified time frames.

2. The policy implementation for these five sectors, cannot be left to the usual policy methods of cadre of generalist civil servants with demonstrated inefficiency of seven decades. Capacity building in NSR must become a national priority with professionals with passion. It will require four professional stages: a) forecasting, validation and implementation of NSR policies, and b) verifiable processes for implementation of NSRs in time-bound objectives which includes: verified assessment of input resources; scrutiny of outcomes and standards; c) monitoring policy milestones; d) policy review and method recalibration to meet those time-bound objectives.

3. In comparison with China, India has been timorous in making bold economic reforms that impact the largest segments of its population. Unless special budget provisions are taken up for enhancing per capita income, India will not be able to strengthen its NSR. In this decade India will have the world largest population, third largest GDP, but low resilience due to its per capita income ranking lower than 140 countries. There is clear convergence of NSR and socio-economic objectives, for which Indian leaders have yet to develop innovative implementation processes.

Notes

CHAPTER IV

Building National Security Resilience (NSR) Through Military Readiness

Harinder Singh

Backdrop

Military readiness is one of the least studied and understood concepts in the field of security studies. In absence of any theoretical framework, policy makers and practitioners tend to define readiness in several different ways. This often results in readiness assessments that are either too narrow or too broad. One of the traditional explanations on readiness is to characterise it as a subset of military capability. The US armed forces define military capability as comprising of distinct pillars of force structures, military modernisation, operational readiness and sustainability. The twin constructs of "operational readiness" and "sustainability" collectively define what is military readiness and in more specific terms the ability to deliver combat potential on the battlefield. In practise, the US interventions in Iraq and Afghanistan were reflective of their readiness standards to undertake sustained military operations several thousand miles away from the homeland. Such bulky overseas operations demand high levels of combat readiness, and above all, the ability of the country's armed forces to logistically deploy, maintain and sustain troops in time and space. An analytical framework to assess readiness levels in modern militaries against a well-defined criterion is therefore a critical policy requirement.

India's national security challenge is somewhat different. As a rising power in Asia and the Indo-Pacific region, the future has in store many more challenges and concerns beyond our immediate neighbourhood. It is therefore an imperative to assess these threats and challenges with exactness, and clarify the precise demands on India's armed forces to deliver on our security needs. However, the process of assessing and reporting military readiness in the Indian armed forces is still in its infancy. India's reliance on achieving its readiness requirements simply through defence funding and equipment acquisitions inhibits us from addressing these concerns objectively. There is an absence of theoretical rigour on factors that explain or define the Indian military's readiness needs, concerns and strategy. Few factors that impinge upon India's military readiness levels are the lack of military readiness metrics, readiness measurement standards and institutional oversight. There is also a need to view our military readiness needs through overlapping frames of national security, foreign and defence policy, doctrines and strategies, funding and technology, structures and capability, training and culture. Simplistically speaking, India's military needs to maintain optimal levels

of operational or short-term readiness against the western adversary, while its emphasis along the northern borders, and in pursuit of its maritime interests, have to be more structural and long term in nature. India's predicament lies in balancing these structural and operational aspects over diverse terrain and myriad threats.

The paper is organised in four sections. First, it examines India's predicament on matters of defence preparedness and the need to graduate to a more a nuanced policy expression to explain the country's military preparedness. Second, it explicates the several systemic challenges that limit the development of a cogent military readiness strategy in the Indian context. Third, it provides a methodology towards crafting a resilient military readiness strategy that could mitigate India's long-term readiness concerns. And lastly, the paper makes a few policy-relevant recommendations to assist policy makers and practitioners in evolving a readiness framework in the Indian context.

The key argument is that a pragmatic shift in the country's approach towards maintaining required levels of military preparedness in the Indian armed forces is urgently needed. India's defence policymakers and practitioners have since long pursued a policy of 'defence preparedness' – principally a self-satisficing concept, which now needs to give way to a more nuanced strategy of 'military readiness' i.e., being 'ready and relevant' to expeditiously deliver on the country's current and future threats.

India's Preparedness Predicament

Maintaining India's territorial integrity, resisting overt or covert acts of terror and its social and economic well-being have been the country's prime national security concerns. Securing these vital national interests requires safeguards and protection against myriad external and internal threats. Besides this, India's rising international and regional stature and, in particular, its growing economic clout will continue to make swelling demands on the military components in the future. It is, therefore, not surprising that India's strong resolve and commitment to maintain high levels of defence preparedness has become more apparent in recent decades. For this, the Indian armed forces have to suitably organise, equip, train and prepare themselves to tackle a wide range of national security threats and challenges. Accordingly, the country has embarked upon a major military modernisation programme with special emphasis on indigenisation for increasing the shape, size and capability of its armed forces. The scale of defence funding reflects both its desire to make up for lost time, in particular on capability development, as well as on traditional and non-traditional security challenges arising out of the changing global and regional security environment. Being the third largest military spender in the world, the Indian armed forces are expected to spend several hundred billion dollars on its long-term defence acquisition plans to include substantial procurement of land, and naval war fighting systems, in order to field highly mobile, lethal, and networked conventional forces. Consequently, it could be argued that the qualitative changes underway in the field of India's military doctrine, technology and organisational culture should significantly transform India's war-fighting capabilities, in turn the military's readiness to deal with emerging threats, over the next decade or so.

India's political leaders have often emphasised that our troops should be trained to fight anywhere, anytime and under any conditions. The emphasis on fighting "anywhere, anytime and under any conditions"

is notable as India's military readiness concerns have never been so forcefully articulated in the past. However, the lawmakers' legislative oversight on readiness issues continues to be weak and uneven. At the national level, the scrutiny of defence preparedness is undertaken by the Lok Sabha Standing Committee on Defence (SCD) periodically, however their reports, despite the tremendous effort involved, lack precision in terms of the broader approach to be adopted to significantly address the country's military readiness needs and concerns. The annual reports issued by the Ministry of Defence (MoD) also present a generic picture and do not adequately explain the combat worthiness of the country's war fighting proficiencies against a laid down military readiness criteria. At yet another level, the three services within the armed forces look at aspects of readiness in a disaggregated form, and their ability to evolve an integrated picture on country's defence preparedness is rather limited. Though one can argue that with the raising of HQ IDS, the situation would have improved, however there is still substantial ground to be covered. Furthermore, in the absence of a national security strategy, and in turn a holistic defence strategy, there are bound to be gaps in the articulation of the broader concept of military readiness and its precise components and metrics amongst the leadership, policy makers and practitioners.

Given the nature of emerging threats and challenges, there is a need to build greater theoretical rigour among the policy makers and practitioners on the subject issue. This paper attempts to address the lacunae by flagging the wider military readiness worries and concerns in the Indian context. It attempts to present a fundamental approach to the military readiness debate, which in this case is largely exploratory and conceptual, however it can be developed by the defence policy makers and practitioners to fashion a cogent and an overarching military readiness strategy, measurement mechanisms and matrix for future threats and challenges. Here, it is argued that there is a need for a pragmatic shift in the country's conceptual approach towards maintaining required levels of operational and structural preparedness in the Indian armed forces. Unfortunately, India has since long pursued what is called a policy of "defence preparedness", which now needs to give way to a strategy of "military readiness" to meet the future national security challenges and threats. The construct of "military readiness" commonly articulated in the modern militaries worldwide is much distinct and different from the policy of "defence preparedness" pursued in the Indian context. While, the former postulates the importance of being militarily "ready and relevant" at all times in order to deal with a wide range of operational situations and contingencies, as against the latter which clearly echoes an attitude of "satisficing" the operational readiness levels (fighting with what is at disposal of the armed forces).

India's predicament is that there is no policy (at least in the public domain) that defines the construct of military readiness, and lays down the metrics, standards and mechanisms to assess and report the country's defence preparedness. As discussed earlier, Indian Parliamentary Standing Committee reports and annual reports issued by the Ministry of Defence offer scant information to engage in an informed readiness debate. As a consequence, the defence policy makers, practitioners, and experts use words such as 'defence acquisitions', 'military build-up', 'military modernisation', 'military capability' or 'military effectiveness' to explain changes in the country's war fighting potential and readiness levels. There is a tendency to use the term imperfectly, and ambiguously. The literal and functional abuse of the term becomes acute when military readiness is lumped with the construct of military capability or military effectiveness. It is therefore important

to assess our security threats and challenges with accuracy, and explain the readiness demands on India's armed forces to deliver on our security needs with clarity.

A clear theoretical understanding on the construct of military readiness among India's defence policy makers and practitioners is a must to appreciate the country's readiness concerns and develop a sound military readiness strategy. Three aspects as follows assume importance.

- First, the construct of military readiness differs in theory and practise from the frequently articulated concepts of military capability or military effectiveness. The fine argument being that any military capability has to be kept 'ready and relevant' to be effective in battle. While, this is well understood in the modern militaries, there is often a tendency to lump readiness with military capability in the domestic context. This is evident from the several interactions undertaken by the author on the definition and understanding of military readiness among India's policy makers and practitioners. There is therefore a need to draw greater clarity on the construct of readiness in order to formulate and prioritise its legitimate operational capability needs for the future.

- Second, the theory and practise of military readiness can be explained at several inter-related levels: the concept, contending approaches, and constraints in articulation. But what is more important, is to understand the concept of readiness in terms of the demand, availability and shortfall in levels of combat readiness at any given point of time. The ability of a state to convert resources in terms of money, manpower and material (3Ms) into a viable military capability to meet a crisis situation explains the concept of readiness. Any shortfall in military capability will be indicative of the lack of readiness on part of a military component tasked to deal with a crisis situation. At yet another level, the concept can also be expressed as operational or structural readiness. Operational readiness would imply immediate delivery of required military capability in crisis or conflict, while structural readiness would entail preparing military capability for crisis situations that might occur in the medium to long term.

- And third, militaries in the west have invested a great deal of expertise and effort at the legislative, bureaucratic and operational level to ensure that the country's military readiness needs are actually met. For instance, the HASC, GAO, CBO, DoD and QDR reports, SORTS and C-ratings in case of United States, and the MoD and HAO reports, RO-R11 and B1-B3 ratings in the case of United Kingdom reflect the theoretical and procedural rigour on military readiness in their case. China too, and true to its strategic acumen, explains the concept of readiness through phrases such as mechanisation, informational-isation, etc. In the Indian context, this is lacking and calls for attention towards building the concept, the standards and measures to analyse the military readiness levels. To begin with, the Lok Sabha Standing Committee on Defence could invest in appropriate research capacities that enable them to examine issues of military readiness with far greater purpose and clarity. This would assist the Indian defence establishment in enabling a top-down bureaucratic understanding of our long-term readiness needs and priorities. In due course, the three services too should define the metrics, standards and mechanisms to address the readiness related issues in Indian armed forces.

India needs to graduate to a more a nuanced policy expression to explain the country's defence preparedness in order to convincingly deal with both the immediate and unforeseeable long-term threats. Military readiness and not defence preparedness will have to be the mantra of the future, and the policy makers and practitioners will have to take a thoughtful view in this regard.

The following section examines the institutional challenges and hurdles that inhibit the development of a cogent readiness strategy and standards, and its implementation in the Indian context.

Systemic Challenges to India's Military Readiness

Militaries in recent decades have seen a quantum change in the way they equip, train, plan and organise for war. The prime drivers for change have been the emerging nature of conflict, and the development and the fielding of cutting-edge war fighting technologies. Introduction of new ideas and technologies usher in their own dynamics and constraints, thus necessitating matching changes in military structures, policies, procedures and practices. Militaries are prone to promote rigidity in thought and action, and rightly so to hedge against uncertainties of war and its deleterious consequences. Shedding of old ideas and practices is sometimes inhibited by those within the military that are presumed to be the drivers for change. Some concerns that impede the crafting of country's military preparedness (i.e., both structural and operational readiness) to face various internal and external threats are discussed at three levels: the lacunae in national security policy and planning processes; the hurdles in resourcing and capability development; and the limits and effect of institutional culture.

Policy and Planning Limitations: Three important policy related aspects are discussed here. First, the importance of promulgating the national security strategy. Next, the necessity of creating relevant higher defence structures and planning processes. And, last, the nesting the military doctrines and strategies in the overall geo-political context.

- National Security Strategy: India's defence policy has rarely demonstrated radical departures apart from the shift that occurred in the aftermath of the 1962 Sino-Indian war. Ever since most changes have been slow and incremental, and often not subject to major politico-military changes in the neighbourhood. In fact, these changes have not even produced a major shift in the threat perceptions, budgetary allocations and military options and responses. The higher defence policy making apparatus is yet to develop sophisticated tools and mechanisms, planning capacities and practices to deal with situations and contingencies. Fashioning such an outlook requires political sagacity and better coordination between the bureaucratic entities, the military services, and the strategic community.
- Higher Defence Planning: Experts argue that the Indian armed forces are on their own when it comes to planning military strategies and fight wars. Their professional outlook and the profusion of single-service specific doctrines, in a way hinders precise articulation and management of joint operations. Furthermore, the internal security environment, which usually mandates an inter-agency attention,

adds up to the security dilemma in a conventional operating environment. This assumes added concern in absence of an over-arching national security strategy. However, the national security planning paradigm seems to be changing progressively. Pursuant to the recommendations made by the Group of Ministers (GoM) Committee constituted in February 2001 on reform of the Indian national security system, several important steps (in particular, installation of CDA and DMA amongst other joint service initiatives) have been taken with regard to higher defence planning structures and planning processes. However, some of these initiatives still continue to be hampered by departmental stasis and institutional mindsets.

- Military Doctrines and Strategy: India's ability to fight a one or two front war has long been debated. Since neither scenario can be ignored in the foreseeable future, the necessity to maintain appropriate levels of military readiness for both fronts including the maritime domain remains important. While the western front can be taken care of, our northern borders still lack appropriate strategic infrastructure and a force posture to take care of the security concerns. Hence, the restructuring of mountain formations and aircraft carrier-based fleets do make sense, as these would enhance India's military deterrent capabilities in the Himalayas and the IOR. In an era, when future security threats are becoming increasingly difficult to predict, it is also important to recast distinct components of the three services for bi-service or tri-service capability cum threat-based roles. These networks centric, and air mobile or sea borne bi/tri-service forces could deploy rapidly to counter a range of traditional and non-traditional threats. Maintaining and sustaining a fair mix of "threat` and `capability" based forces shall continue to be the primary military readiness challenge in the foreseeable future. At the policy level, there is a need to articulate the national security strategy which can then form the basis of drawing up the national military strategy, the integration of military doctrines and strategies with the political aims and objectives, and the long-term force development plans.

Capability Development: The aspect of capability development is discussed at three levels. First, the aspect of long-term defence budgeting, and its optimal utilisation. Second, the lack of capacity for research and indigenously develop hi-tech military platforms. And last, the chronic delays in defence acquisitions that ail the armed forces and in turn their readiness levels.

- Defence Budgeting: In the late forties and the fifties, India spent an average of 1.6 per cent on the country's defence services, when the expenditure spurted to 3.8 per cent as a consequence of the 1962 Indo-China War. In late 1980s, the budgetary allocation saw some increase, but lately, the outlay has levelled out to around two per cent or slightly less, despite repeated demands to maintain it at three per cent. This might be some cause of concern for the defence policy makers and practitioners. At yet another level, the worry is that the country's defence budgeting continues to be a financial exercise. While the long-term integrated perspective plans are supposed to be the basis of the Defence Five-Year plans, and the annual defence budgeting process, the long-term perspective plans have never been approved by the government. And since these do not get sanctioned, the link between force planning and defence budgeting does not get established. Even the annual defence budget allocation also does not flow out from approved programmes, where the past trend of defence

expenditure is the main basis of future budgeting. If we were to ensure economy and efficiency in defence expenditure, and in turn also ensure the "operational" and "structural" readiness of the Indian armed forces, then establishing the link between the country's defence budgeting and planning process is a must.

- Defence Technology: India has Defence Public Sector Undertakings (DPSUs) under the control of Department of Defence Production, Ministry of Defence (MoD). These undertakings together with the Defence Ordnance Factories (OFs) form the backbone of India's defence production. Unlike the OFs which produce low end military items, the DPSUs cater to the strategic needs of the Indian armed forces. The OFs in particular are responsible for manufacture of arms, ammunition, armoured vehicles, and ordnance stores. The organisation has performed sub-optimally and key areas of concern remain with regard to the internal management of these factories, the range and depth of production, the pricing of items, and their quality and the inordinate delay in delivery schedules. Various governmental reviews have recommended measures to energise the management of these factories, but so far other than corporatisation of some of these establishments not much has been done. Surely India needs to encourage and build its military research, design and production capacities such as the aspirational defence corridor projects in the two states of Uttar Pradesh and Tamil Nadu to meet the long-term technological demands, but not at the cost of country's defence preparedness in the short, medium and long term. At yet another level, this also calls for a commensurate up gradation and refinement in the defence acquisition procedures. The defence acquisition process is progressively improving but it still suffers from several institutional and procedural deficiencies. In terms of the acquisition reforms, there is an urgent need to graduate beyond the reforms currently centred around high level of "procedure-isation" of the acquisition processes, and move towards the timely delivery of military capability.

- Defence Acquisitions: Military modernisation must address the short and long-term war fighting capability imbalances amongst the three services through an integrated framework of strategic planning and coordination. Interestingly, and despite increased budgetary allocations, the country's military modernisation drive continues to suffer from the lack of a national security strategy and downstream strategic guidance; sound higher defence structures and decision-making process; and organisational reform in the Indian armed forces. The modernisation process is further fettered by the drive for uneven technological indigenisation, the lack of civilian expertise in matters of defence and strategy, and skewed organisational priorities. All this makes the Indian nation militarily less prepared to meet some threats, and in turn, dampens the ability of the armed forces to better match these threats with appropriate military capabilities. In other words, the Indian defence acquisition system can be easily surprised due to its weak institutional guidance and structures, diffused procedures and practices, inter-service rivalry and lack of civilian expertise on defence matters. Clearly the aspect of capability development which is largely a function of budgeting, technology and acquisitions demands a substantial change in the role and functioning of the defence finance, the scientific community, the production agencies and the acquisition bureaucracies. While considerable momentum can be seen in

this direction, there is more that needs to be done on the adequacy and responsibility of the DRDO. The defence acquisition plans need to be clearly articulated and directed to enable participation in research and production from a wide range of public, private and multi-national defence enterprises and entities.

Institutional Culture: Three aspects assume importance in this context. First, the disconnect in the country's civil-military dynamic. Second, the inability to affect cogent structural reforms or organisational change in the three services. And three, the lack of genuine professional military education opportunities and hence the professional culture in the armed forces.

- Civil Military Relations: Civil-military relations lie at the core of national security decision making process. And in that sense, the Indian defence establishment needs to grow out of this stasis. Some of it is happening but more needs to follow. Cross pollination of national security structures with defence expertise and experts could pave the way for institutional equity, and which in turn, could contribute towards the growth of strategic culture and operational thinking in India. In the long term, this entails the vertical and horizontal integration of the Ministry of Defence (MoD), the purple-isation of individual service headquarters, the representation of military staff in national security structures, the leveraging of elements of military diplomacy, ensuring consistency in defence resourcing and budgetary utilisation, systemic reforms in the acquisition process and the defence industrial base, and the military readiness for a range of threats and challenges.

- Structural Reforms: The Kargil Review Committee (KRC) and Group of Ministers (GoM) report had stressed the need for defence reforms. Amongst other several recommendations, they have suggested the appointment of senior armed forces personnel of requisite operational expertise in the MoD, to make use of their experience in the national security planning processes. This will enable effective decision making at the highest level, and also promote much needed integration amongst the three services. Considering the fact that the key to success lies in integration of the three services, the appointment of Chief of Defence Staff (CDS) has ameliorated the military's oft repeated complaint of single-point military advice. There is also a need to identify the common operational and logistical footprint amongst the three services, with a view to evolve cost effective joint practices. At another level, the Indian armed forces also need to re-evaluate its teeth to tail ratio, and consequently progress towards maintaining a lean and mean war fighting machine. The rightsizing of existing force structures alone can enable them, to recast some of its combat and support components, and to forge additional capabilities it wishes to create for the 21st century. It is important to bring in structural change through small but incremental steps based on "build a little, test a little, build a little" concept. New ideas and technologies carry serious transformational implications because of the need to integrate disparate force structures, their doctrines and capabilities. Besides saving time, this approach promises better absorption of war fighting doctrines and technologies, and can act as an accelerator for large scale transformations in the armed forces.

- Education: The Indian armed forces are engaged in modernising its forces with increased emphasis on mobility, lethality and battle space transparency. This calls for a transition from a manpower intensive to a technologically capable force in terms of network centricity, manoeuvrability, lethality and survivability under diverse battle conditions. Greater reliance on technology and innovation would imply a corresponding shift in organisational culture, training and education. Professional education will be crucial towards developing skills and capacities which are capable of meeting the future challenges. Foreign military exchanges and deployment for peacekeeping operations have indeed contributed towards new organisational thinking and internal reform. However, there is a need for greater professional learning through formal academic education. Between "military training" and "military education" there is a thin line. While military training focuses on the ability of military organisations and individuals to perform specific operational or tactical tasks and functions efficiently and effectively, focus on military education particularly enhances the breadth of military knowledge, reasoning abilities and understanding on diverse strategic perspectives, innovative thinking and complex problem-solving behaviour. Exposure to strategic and security studies at established universities and think tanks could provide the much-needed impetus to the doctrinal thought, the necessity for technological infusion and professional orientation.

The Indian armed forces have made significant strides in terms of doctrinal thought and capability development in the last decade or so. It would be suffice here to say that future military challenges and threats would demand more timely and precise application of force. In that context, it would be imperative to resolve the hurdles and impediments discussed above to facilitate adequate and appropriate levels of structural and operational readiness among the armed forces. A healthy civil-military relationship alone could contribute to the achievement of the desired military readiness levels – structural and/or operational. It would therefore be necessary to evolve the right readiness concepts, metrics and mechanisms in context of the Indian armed forces. A study of military readiness practices followed worldwide therefore becomes imperative.

The following section dwells on the crafting of a resilient military readiness strategy that could mitigate India's long-term readiness concerns with regard to the external and internal security threats.

Framing a Readiness Strategy

The prevailing geo-strategic environment, the critical national security challenges and threats that the Indian state faces, and the imperatives and implications of future military conflict or border confrontations are some concerns that will define the military readiness needs of the future. India is faced with a wide range of conventional and sub-conventional threats – some of which are not clearly discernible – which places greater demand on the defence planners and practitioners to deliver operational readiness in times of crises, or conflict. Military readiness is all about recognising these threats so that the available resources in terms of money, manpower and material could be optimally shaped during peace time to fashion and deliver the instruments of force, as and when required. However, the much talked about gaps in the doctrinal and capability development of the Indian armed forces severely impacts the deliverability of the country's

military preparedness in times of crises. The broad approach towards framing of a readiness strategy is discussed at three levels: the first principles that would underpin the strategy crafting process; the analytical framework necessary to explain our military readiness concerns and the strategic pitch to craft India's theatre-wise readiness strategies.

First Principles: Given the myriad threats and challenges that India faces, there is a need to formulate a comprehensive military readiness strategy to meet the unforeseen operational contingencies of today and tomorrow. Four principles as discussed below are fundamental towards crafting a cogent military readiness strategy.

- First, there is a need to re-examine the problem of shaping India's hard power in the twenty first century. India's capacity to master the creation, deployment and use of military instruments despite six decades of independence is still not precise. It will depend on how the country's leadership both political and military manages to reconcile between the strategic opportunities, threats and challenges that have been identified in the regional and global context. India armed forces still remain relatively a conservative organisation that has focused much more on "satisficing" hard power rather than "maximizing" it. In other words, the characteristic reluctance to use "threat of force" or "use of force" to secure decisive operational outcomes might limit India to be content with remaining a traditionalist military power for some time to come. And if this is to be altered, then the defence "transformational strategies" that are often spoken about will have to be vigorously pursued for building a strong military capability, organisational culture and structural strength.

- Next, there is a need to formulate India's military readiness strategy in the years ahead. India's economic rise and access to technology seems to be changing perspectives within the country and overseas, and the increased resource allocation to military modernisation should be usefully utilised towards the growth of the Indian armed forces. However, a technocratic or an acquisition oriented or a manpower intensive approach alone might not deliver the readiness needs of the country. There is an express need to strategize India's readiness concerns in the frame work of possible threats and challenges, the military capabilities required to meet these threats and challenges and the likely time frames by which these capabilities are required. A structured approach can possibly help the policy makers and practitioners to decide on the nature and optimal levels of military readiness, both operational and structural, required during peace time and war. Simplistically speaking, India needs some measure of "operational readiness" when it comes to dealing with Pakistan, and "structural and operational readiness" to ward off the long-term military threats and challenges from China.

- Third, there will be a need to synchronise the readiness strategy in terms of the money, manpower and material (3Ms) that is available, and whether this readiness building approach has to be linear or cyclic in the medium to long term. Each factor i.e., the 3Ms play a crucial role in building the operational and structural readiness of the armed forces, but more importantly in concert with each other. However, there is often a tendency to consider or evaluate these factors in isolation and draw

conclusions that might not be holistic and appropriate for addressing our readiness needs or deficiencies. Effective management of the 3Ms alone can ensure the deliverability of military readiness both operational and structural in context of the Indian armed forces.

- And fourth, there is a need to generate an abiding interest amongst the defence policy makers and professionals in the field of military readiness. How could this gap be addressed? First, is the need to introduce the study of military readiness as an important component of strategic and military studies within the country. Second, there is a case to train select military officers in the military readiness concepts and practices commonly pursued by militaries in the West. This training could facilitate better management of money, manpower and material for achieving the desired military readiness levels. Third, there will be a need to create appropriate civilian and military structures to measure and oversee the readiness levels of the several components of the armed forces. And fourth, the military readiness measurement and reporting structures so created should become the principal agencies that ultimately testify to the designated legislative bodies about the operational or the structural health of the armed forces on a periodic basis. Most importantly, the Lok Sabha Standing Committee on Defence and the various departments of the Ministry of Defence and Service Headquarters would stand benefited by the creation of such agencies or structures.

Readiness Framework: Most importantly, the argument developed by Richard K. Betts, an American scholar, who utilises a three-tiered analytical framework namely, "Readiness for What?", "Readiness of What?", and "Readiness for When?" to explain military readiness needs and concerns is most pertinent. Based on these three distinct lines of investigation, a comprehensive military readiness strategy contributing to national security resilience can be examined and evolved in the Indian context. This analytical framework assists in investigating the readiness concerns in terms of the likely "threats", "capability" and "time" dimension respectively. These questions can be examined against a wide range of military scenarios emanating from the continental, sub-conventional, maritime, asymmetric, non-traditional threats, and including out of area contingencies. In effect, this three-tiered analytical framework developed by Betts brings richness and rigour to our overall understanding on military readiness. In absence of a clear theoretical understanding, this aspect is otherwise so much lacking in the Indian context. And for a country that is characteristically defensive in its strategic-military behaviour, this understanding assumes even greater operational significance lest the excessive emphasis on military readiness detracts the country's policy makers from the primary national objective of socio-economic development. Simply put the framework provides the basis to formulate the policy choices by explicating the complex trade-offs that are integral to the military readiness debate. A brief explanation might be relevant here.

- Ready for What? First, the expression "readiness for what?" explains which adversaries should the Indian armed forces be ready to fight against, and under what operational conditions, and according to what military doctrine or strategy. In fact, this line of analysis can enable us to throw significant light at how much military capability might be required to deter, or dissuade, or if necessary, defeat the potential adversaries' threat or front wise posture and actions.

- Ready of What? Second, the phrase "readiness of what?" explains the military capabilities that might be required to marshal and deploy them in times of crises, or possible confrontations, big or small. This will include land, naval and air warfare capabilities both in the conventional and sub-conventional realm, their inter-se priorities, and how would boosting of one service affect the operational efficacy of the other two services. Maintaining the inter-service balance with relation to the emerging national security challenges and military threats would perhaps form the essence of this three-tiered analytical exercise.
- Ready by When? And third, "readiness by when" should the potential capability latent in a military force (which includes the country's economic capacity) can be brought up to actual combat needs or in times of crisis. In other words, what should be the readiness status of the armed forces during peace and wartime.

Crafting A Readiness Strategy: The foregoing frame of analysis establishes the military readiness demand which might be placed on the Indian armed forces in the short, medium and long term. It further clarifies that the defence preparedness needs of the country have to be seen at two distinct levels: structural and/or operational level. In simple terms, the military readiness needs might have to be "operational" in the case of our western adversary; whereas it might have to be both "structural and operational" in the case of our northern adversary. A brief explanation to craft India's frontier wise approach to military readiness might be relevant here.

Western Borders. Conventional and sub-conventional threats emanating from the west demand an immediately deliverable military readiness in terms of the "ready and relevant" combat potential of the land, air and naval forces. It should be prepared to deal with incidents and episodes of cross border terrorism in the state of Jammu and Kashmir and elsewhere, and military intrusions in the hilly terrain, and possibly a military misadventure in the plains or the desert sectors. Though, the latter might be least likely to occur in the future. In other words, the importance of short term or "operational" readiness is far more significant than the long term or "structural" readiness in the context of our western adversary, although the importance of structural readiness cannot be ignored. Since the military structure and strategy is broadly in place, the operational focus of the Indian armed forces will be on maintaining, upgrading or sustaining the existing war fighting capability. Besides, it will also involve ensuring the overall preparedness of the counter insurgency forces such as the Rashtriya Rifles and Assam Rifles to fight insurgencies beyond the capability and capacity of the paramilitary forces, if required. Fighting long drawn insurgencies or terrorist activities are again a function of operational readiness and day to day counter insurgent/terrorist strategy.

Northern Borders. The threat along our northern borders being medium to long term requires a focus on "structural readiness" in terms of the mountain warfare, maritime and strategic force structures, consistency in military modernisation programmes such as unmanned warfare and cyberwarfare, development of strategic infrastructure and wherewithal, and creation and fielding of niche asymmetric war fighting capabilities. There is therefore a vital necessity to evolve a strategic view on India's prime security concerns along its northern borders with China, and in the maritime and strategic war fighting domains. The country's 4000

kilometres plus long border with China spans a variety of difficult mountain terrain, different revenue jurisdictions, and the involvement of several security agencies and operational control mechanisms. Furthermore, the punctuation of this frontier by the sovereign states of Nepal and Bhutan technically complicates the overall security management of the border areas. As such, it can be argued that the Sino-Indian frontier possess a structural problem in terms of its management, the development of road and rail infrastructure, the overall availability and deployment of security forces, and their command-and-control. Several decades of inattention both at the macro and micro level today places a heavy demand on the preparedness of this important frontier. China's brisk military modernisation and infrastructural development seems to be increasingly accentuating the capability gap between the two countries. The Chinese technological strides in the development and fielding of strategic weapon systems and disruptive war fighting capabilities pose an added military challenge to us. It might therefore be prudent to designate India's military readiness needs vis-à-vis China in "structural" terms and not simply as "operational" in nature.

The following section makes a few policy-relevant recommendations to assist the lawmakers, policy makers and practitioners in evolving a comprehensive military readiness framework in the Indian context.

Policy Recommendations

The first priority of India's national security apparatus is to ensure that the country's armed forces are kept "ready and relevant" to fight todays and future wars. Creating war fighting capabilities can take decades but it is an even bigger challenge to preserve the readiness levels. Hence, any method laid down towards preserving the readiness levels cannot be simply limited to dealing with war fighting insufficiencies as they appear, but to logically anticipate and prevent them from occurring through a credible readiness warning framework. This section attempts to lay down a broad policy framework for institution of measures to compile, analyse and report the military readiness levels. These might have to be undertaken at three levels:

- Readiness need(s): Clear and concise national security objectives need to be outlined to specify the levels of military readiness - operational and/or structural that our armed forces must attain, maintain and sustain theatre wise in the short, medium and long-term.
- Fixing the readiness standards: Create reliable readiness measurement standards and metrics that are relevant at the unit and formation level to assess whether the current and future force structures are able to meet the operational demands in diverse operating environments.
- Framing the readiness monitoring mechanisms: Necessity of responsive readiness monitoring mechanisms to ensure that military readiness receives appropriate attention within the policy circles, both bureaucratic and military, that in turn prompts corrective processes and resource allocation.

Readiness Needs: India's readiness needs would be dictated by the military outcomes that the armed forces are expected to deliver along our northern and western borders. Overall readiness levels will therefore have to be determined from the wide range of internal and external threats to include airspace and maritime domain that the security forces might have to simultaneously handle. Simplistically speaking, the Indian

armed forces need to maintain certain levels of operational readiness against our western adversary, while its objectives along the northern borders, and in the Indian Ocean Region (IOR), have to be more structural and long term in nature. India's dilemma lies in balancing the structural and operational aspects of our readiness needs required by the three services over terrain and myriad threats.

Readiness Standards and Metrics: Military readiness is usually expressed by looking at resource inputs alone. For instance, the money allocated and spent, military equipment identified, contracted and delivered, military personnel recruited, inducted or superannuated, etc. These factors only explain what contributes towards building military readiness, but do not analyse the operational satisfaction levels at the point of delivery. Very often, the readiness metrics focuses on the frontline units and formations, but does not assess the rest of the military as meticulously and since military commanders are more concerned with outcomes at the tactical level, the structural readiness needs tend to be ignored. Lack of analytical capacities and bureaucratic disinterest can undermine the expression and measurement of military readiness. Even when the establishment wants to make an honest attempt, the sheer vastness of technical detail and data, and its selective compilation by competing interest groups may result in flawed readiness assessments. Underlying this muddle could be the organisational failure to establish clear terms of reference and standards for measuring readiness. Several reasons have been ascribed for this inadequacy like the lack of importance to readiness vis-à-vis other military planning priorities, difficulty in formulating credible measurement models and feeding of inaccurate or unreliable data. Experts also argue that shaky standards and dubious data could make people sceptical about the revealed readiness data. Such assessments could sometimes also be adversely affected by increase in peacetime organisational tempos necessitated either by routine engagements or recurring crises. The readiness standards and metrics therefore need to be framed at three levels:

- Unit Readiness: There is a need to specify performance standards for different types of military units and develop systemic means for estimating how long units take to achieve mandatory levels of operational readiness. It is essential for all combat and support units to report the resources they need in terms of men, machines and material (3Ms) to maintain peacetime readiness levels, and the training standards required to perform an operational role, or task, for which they are organised and equipped. Simply put, the manpower, equipment, training and logistical support would collectively define the unit readiness level.

- Force Readiness: This would be a collective measure of the individual and unit level training capacities, availability of manpower, equipment and warlike stores, and time-sensitive mobilisation and deployment of the force for operations. Such assessments will be specific to the predicted operational scenarios and distinguished by the theatre of operations, scale of mobilisation and adequacy of warning period. Today, force readiness is not only required to be measured at the single service level, but also at the bi-service or the tri-service level, in light of the expanding range of joint military operations. This would involve finding a common operational and logistic footprint and planning framework between the three services.

- Sustainability: There is a need to continuously assess the availability and reliability of the war fighting material, the ability of the armed forces to mobilise additional personnel, equipment and material into the designated conflict zones, and the country's economic and industrial capacity to induce a surge in defence production. This would involve mechanisms that precisely identify the unit and formation activity levels, the consumption and attrition rates, the levels of organisational and operational uncertainty, and the consistency and the adequacy of industrial capacity and military support services.

Readiness Monitoring Mechanisms: First of all, there is little doubt that conceptualising, creating and preserving readiness has to be the cornerstone of any national security strategy. The creation of management structures is important to ensure that military readiness concerns permeate all levels of national security decision-making. To ensure congruence, a tiered based readiness management mechanism is recommended. This could be organised as follows:

- Defence Readiness Council: This council could be charged with the coordination within the key ministries and agencies that influence readiness related decisions at the highest level. The council chaired by the RM and including the CDS and service chiefs; technology developers, production and procurement agencies; and infrastructure and transportation enablers from ministries of railways, civil aviation, surface transport, national highways and border roads, petroleum and oil, telecommunications, shipping, food and supplies, etc would periodically review the readiness needs and concerns at the apex level. The council would consider recommendations made by the Defence Readiness Committee to link the near-term operational needs with long term readiness programmes (largely structural in nature). The aim of constituting this council being that, critical military readiness concerns are brought to notice at a sufficiently high level to keep the political leadership apprised of readiness deficiencies on a periodic basis. The readiness council will have to be distinct from the defence acquisition council and be more multi-disciplinary to address all men, machines and material related preparedness aspects. The council secretariat could possibly be headed by a service three-star officer and staffed by a mix of civilian and military specialists to act as the focal point for providing readiness advice to the government.

- Defence Readiness Committee: This committee could be constituted under HQ IDS and tasked with developing the readiness metrics in consultation with the three services. This can be the forum for raising, discussing, evaluating and recommending solutions on key military readiness issues raised by the three services. It should also be tasked for developing India's military readiness criteria and especially those indicators which provide warnings on future readiness problems and alerting the Defence Readiness Council to our critical readiness concerns. The committee would be organised and staffed to address issues of manpower, equipment, material and strategic infrastructure and mobility needs. The committee could be an adjunct of the directorate dealing with long term integrated perspective plans (LTIPP). The Defence Readiness Committee would in turn also work with the readiness directorates of the respective services, and various defence related research, production and procurement agencies.

- Defence Readiness Sub-committee: This sub-committee will have to be constituted by each service, and include representatives of the concerned line ministries and agencies, that contribute to the operational readiness of the armed forces. Ideally speaking, the operational logistic directorates (or equivalent departments) of the respective service headquarters would perform this function to maintain readiness oversight. The readiness levels achieved by each service could be evaluated at this level and based on the assessments made requisite course corrections could be applied. Currently, the process of assessing readiness levels is rather fragmented and divided due to multiple channels of reporting within each service. Separately, the military directorates designed to collate, compile and analyse readiness data may lack the requisite staff expertise, capacity and analytical skills, which in turn could affect the overall preparedness of the Indian armed forces.

A fair amount of military understanding already exists on the issue amongst the three services, and several readiness assessment and reporting mechanisms are today in place. However, these assessments being departmental in nature might not address the country's overall readiness concerns to comprehensively meet our national security aims and objectives. Also, it might not be a good idea to assess readiness levels through water tight compartments, when it involves a great deal of cost and effort to the nation. India's military readiness requirements need to be viewed jointly at each level of operational activity, and aggregated along the military hierarchy to enable realistic assessments and course correction. The proposed readiness framework would not only explain how far the nation's military postures can address our national security concerns, but would also accord greater clarity to strategic thinking in India. More importantly, it will be possible to communicate India's military readiness concerns to the highest political level. And, the framework could also enable a common understanding on military readiness related issues at the legislative, executive and departmental levels. The Parliamentary Standing Committee on Defence, the Comptroller Audit General (CAG) and other statutory bodies concerned with national security could immensely benefit from the assessments made at several levels by the three-tiered readiness measurement framework. Suffice to say, it would call for creating sufficient multi-disciplinary skills and staff capacities to undertake readiness related analytics and decision making.

Conclusion

Modern militaries consider readiness as an important facet of the national security policy, planning and decision-making process. Creating war fighting capacities takes years of hard work but an even bigger challenge is to preserve existing levels of readiness. In the West, there has always been enough evidence in the public domain to evaluate the military readiness levels in terms of delayed mobilisation, insufficient manpower and equipment, material and infrastructural deficiencies and training inadequacies. On the other hand, India has typically demonstrated a lack of enthusiasm in maintaining high levels of defence preparedness. Strategic restraint has been the defining feature of our foreign and defence policy, and this has clearly reflected in the military modernisation process till a few years back. Economic affluence and greater access to technology seems to be changing these perspectives, and increased resource allocation is contributing towards the growth of the armed forces. However, emphasis on defence acquisitions alone as the key to

military modernisation is unlikely to advance the country's military preparedness objectives. There is therefore a need to re-examine our military readiness needs against the backdrop of the institutional hurdles and procedural limitations.

A pragmatic approach towards preserving India's readiness levels therefore cannot be to deal with defence preparedness issues as they emerge, but to anticipate and prevent them from occurring through a credible readiness warning system. In our context, the problem of structuring a readiness warning system lies in our inability to comprehensively define what military readiness is, and not what it isn't. Clear and concise standards are required to be articulated to specify the levels of military readiness that our armed forces must be able to attain and sustain. Creation of structures that accord appropriate oversight over the readiness policy, assessments, and course corrections is a must. A policy framework is important to ensure that collectively the hierarchical levels in the armed forces collate, compile and the preparedness data in terms of manpower, material and monetary allocations in order to address the immediate operational deficiencies and our long-term readiness concerns. Above all, this could provide the much-needed basis for an oversight at the executive level and legislative scrutiny of India's military readiness standards.

Note

This paper is based on the argument developed by the author in a monograph titled, "Establishing India's Military Readiness Concerns and Strategy" published at Mohan Parrikar Institute of Defence Studies and Analyses (MP-IDSA), New Delhi in November 2011.

Notes

CHAPTER V

Policy Deficits and Recommendations

The Context

The 21 St Century is poised to be a hot bed of uncertainties. It's fulcrum will be the Indo-Pacific region and its main actors will be India and China. It will be an understatement to say that merely incorporation of technology or even enhancement of resilience from within a nation state alone will not be the deciding factor in a cumulative way to ensure peace and tranquility at a global level. The very quantum enhancement in information technology or communication facilities will not be able to ensure better international relations amongst states at regional and global level. The literal states of the Indian Ocean Region will be affected as never before. How will the mechanics of Deterrence which has been related to and achieved by the harnessing of Technology can be replaced by anything but Resilience developed from within by each nation state poor or rich, democratic or totalitarian to deter super powers from interfering politically, economically, socially and geocentrically. Hence National Resilience policy making and strategies employed to safeguard each's national interest and national security.

What then are the major fault lines and the problematics. These problematics related to inter nation state issues arise at three levels: geographical congruity, alliance congruity and global congruity.

For each there is a unit of analysis ranging from difference in projecting nation interest, difference in interdependence and difference in developing Global Governance. It will be cruel to label it as "thieves relationship" but something more sinister than the politics of globalisation. Though there is an honour amongst thieves yet it maintains that there are some interesting "constructivist" operationalisation of sharing power for mutual benefits. How far this will be possible in amongst smaller nation states suffering from being victims of asymmetric in the realm of power.

Global politics and pursuance of individual national interest can explained to an extent by the Adaptation Theory but that too fails to arrest the real fault lines of global politics and the incapacity to resolve issues created by the ever expanding problematics of International Relations (IR). IR and its theories from Realism to Constructivism is becoming more and Transactional rather than aiding to usher in Transformation with ethics and values, where Legal preconditions will be accepted to ensure peace and tranquillity regionally and globally.

Deficit In India's Policy Making: Ever since India gained independence, Indian decision making processes have failed to be decisive and has remained ambiguous in all kea areas of National Security, Strategic outlooks and a hoard of other issue areas like Education, eradication of poverty, enhancing per

capita income, indigenisation of key industries affecting National Security, evolving Soft Power, bringing Women in the sector of organised labour force and urbanising Rural areas, and migrant labour to name a few very important ones amongst a horde of others. Monopoly in Research and Development by the Government in strategic areas denied the participation of the Private Sector to produce the baseline capacity to be self-reliant in Defence Production. This has made a serious impact to achieve Resilience and indigenisation simultaneously.

Policy Making: One of the major lacuna in the Indian decision making system is the total absence of a scientific methodology to institutionalise Policy making processes. Lack of any form of Over Sight authority has made the government system indulge in adhockism, arbitrariness and not allowing fresh thinking or accepting contrarian views. It has had a tremendous effect leading to massive brain drain in the country. All these factors does not permit India to become self-reliant or a resilient nation state.

Policy Recommendations: Achieving Resilience and Strategic Autonomy

Apart from the five major recommendations that have been narrated in Chapter II (pages 32-33) of this document, the most desirable action to be undertaken by he government will be to

(a) Integrate Higher Education Institutes with Government organisation.

(b) Create a process of putting into action the "Revolving Door Policy" thereby enhance the cross fertilisation of ideas to bridge the gap between the realm of ideas and the domain of public policy making.

(c) Process of lateral entry from Civilian Organisationsinto government organisations and Ministries both at Centre and State levels and vice-versa.

(d) Allow Armed Forces personnel to be exposed to higher educational institutes to widen their perspectives and remove their mid fixes in fixed minds.

The above recommendations will over a period of time be helpful to evolve a robust Resilience of the country and evolve the right perspectives for National interest and National Security policy making.

Policy Recommendations: Achieving Resilience and Capacity Building

Failure of the past five decades to address our fundamental weaknesses in eradicating poverty has resulted in a lop-sided human capital formation. And as India, with the world's largest population continues to drive its decisions based on economics of transaction costs, supply and consumption, our ability to develop competitively, will impair its domestic growth and security well-being as well. For any country to acquire hard power for military effectiveness, then it is imperative that it develops its economic and financial resilience. Indian security analysts need to consider the proposition that national security resilience is dependent on enhancing country's fundamental socio-economic deficits. In the case of India, it includes

several important aspects such as: poverty eradication; participation rates in female labour force; human capital formation; international competitiveness in clean energy generation, etc. The aforementioned limitations need to be assessed as national security imperatives which need to be implemented through special purpose initiatives.

An assessment of research conducted in India in the field of strategic or defence studies during the past five decades informs that most of the research has examined deep nuances of policies. Whereas investigations on methods or processes that are required to implement policies are few and far between. In order to make comprehensive policies, there is also a need to examine policy implementation processes and alternatives for effective outcomes. The field of process research has remained underdeveloped in India.

For this, an NSR Agency is required for executive oversight of implementation of NSR objectives that should be clearly identified and are approved by the Government. Any NSR Agency, mandated to achieve NSR objectives, would require a professional cadre of implementation specialists, without which, we will be found wanting in implementing the necessary objectives.

These are recommended at six levels:

A. Creation of NSR Research and Applied Studies Institute: The intent and the purpose of NSR Institute will be to provide the Indian public and executive branches, evidence-based policy alternatives for building up the country's national security resilience. Considering the need to advance scientific research on NSR, we need to examine barriers, limitations, opportunities and methods o implementation processes that could build NSR capacities. NSR institute should research into designing ideal-type institutional structures and international best practices, adapting with appropriate modifications for India. An NSR Institute should also be tasked to draft White Papers for inter-agency coordination processes for policy implementation relating to the following eight initiatives:

(i) Rethinking on emerging contours of impact of strategic autonomy on national security resilience in view of changing political alliances, e.g. pulls and pressures of uni-polar to multi-polar system.

(ii) Operational, infrastructural and logistic resiliency to sustain prolonged operations and losses in protracted conflicts with potential for restorability of military capabilities in the border regions and Indian Ocean region (IOR).

(iii) Alternative policies to enhance Comprehensive Strategic Power (CSP). Examine limitations of assessing national security resilience in terms of financial allocation to the defence sector.

(iv) Convergence of the country's economic policies, priorities and capacities to enhance for national security resilience:

(v) Pathways to enhance Financial Sector Resilience and International Trade.

(vi) Impact of social polarisation on national cohesion; de-radicalisation of social fault lines an essential national security imperative.

(vii) Institutionalisation of conversion plans for national precision and engineering industries to meet surge in military industrial demands, and mobilisation of manpower for protracted conflict.

B. Confederation of Advanced Technology Enterprises for R&D in India: Being part of the public sector, advanced technology R&D in India has not grown competitively due to constraints of public finance. Considering the intensive pace of technology changes requires higher scale of R&D investments, costs and risks. On the other hand, the military users have low scale of demands. Advanced technology R&D in India being controlled by MoD monopoly, it stifles competition and innovation. As R&D allocations have to compete for funds, which views military applications R&D as public discretionary expenditures. On the other hand, social sector priorities are viewed as essential allocations. Given the dynamics of technology development, for achieving efficiency gains there is a need to have export market competition driven, profit-oriented R&D organisational model. An initiative could be developed with a Confederation of Advance Technology Research and Enterprise Development by creating consortium of technology specific R&D clusters in the academia, private and public sector precision engineering units. These would need to be supported by marketing and financial enterprises, with centers for Incubation, Innovation and Intellectual Property Rights.

C. Advanced Technology Performance Evaluation Council: In order to develop competitively, advanced technology projects require independent technology proficient organization to conduct assessment of technology alternatives; implementation monitoring; audit and performance evaluation. India needs a statutory organization with professional expertise that can facilitate legislative oversight, executive and Cabinet-level review for funding. If independent technology development agency is created, it will be useful not only for the defense sector R&D, but for projects in space, energy, communications, transportation or any other sector that requires advanced technology alternatives to be evaluated.

D. Agency for Conversion and Convergence: For India to strengthen its NSR capacities, it will require institutionalised structures and processes for converting and convergence of national assets such as:

(i) Industrial, Logistics and Manpower in civil and military sectors.

(ii) Space; Civil and military aviation; naval and maritime sectors.

(iii) Sources of oil and energy security, production in domestic and from international trade to buttress energy resilience

E. Create cadre of professionally trained management executives for policy implementation: A civil service cadre trained for revenue collection has not provided evidence of success over the past seven decades in either policy implementation processes or project management skills. These functions require specialized training in processes for policy validation; process verification; monitoring and scrutiny; outcome assessment and review; and recalibration. These processes should be institutionalized to function with or without changes in the government. It requires a cadre of policy implementation specialists trained in disciplines such as: Operations Research: decision sciences; systems analyses; systems engineering; financial forecasting; combinatorial optimisation; logistics engineering; etc. etc. There is a need for greater precision

and time-bound scrutiny methods built into our policy implementation process. A civil services cadre, engaged in public policy making, which assures promotion, sans competition and professional accountability is more likely to turn into a sinecure of rent seeking bureaucracy, anywhere in the world.

For the long term, the need is to build a consensus among the strategic research communities and economists that national defence and deterrence capacities have to be predicated on economic, financial, social, industrial and technological resilience. And requirements of poverty eradication and human capital formations are not only sustainable development goals, but these are national security imperatives. The Indian political leadership should not miss an historic opportunity to build India's comprehensive strategic power, because irrespective of different hues, shade or stripe of political ideology, there is a tendency to take a safer and conservative political option. And when accosted by challenges that requires political mobilization of public will to build national resilience, this tendency lays blame on deficits of the past.

Policy Recommendations: Achieving Resilience through Readiness

The prevailing geo-strategic environment, the critical national security threats that the Indian state faces, and the imperatives and implications of future military conflict are some concerns that will define our future military readiness needs. Faced with a wide range of conventional and sub-conventional threats – some of which are not clearly discernible – it places greater demand on the defence planners and practitioners to deliver operational readiness in times of conflict. Military readiness is all about recognising these threats so that the resources in terms of money, manpower and material could be optimally utilised to fashion and deliver the instruments of force, as and when required. The key argument here is that a pragmatic shift in the country's approach towards maintaining requisite levels of military preparedness is urgently needed.

Policy Deficit: Since long, India's defence policymakers and practitioners have pursued a policy of 'defence preparedness' – largely a self-sacrificing concept, which needs to make way to a more nuanced strategy of 'military readiness' - of being 'ready and relevant' to expeditiously deliver on our current and future security threats.

Policy Framework: An analytical framework to address our military readiness needs and concerns is most pertinent. Based on three distinct lines of investigation, namely, *Readiness for What? Readiness of What? And Readiness by When?*, a comprehensive military readiness strategy can be evolved in the Indian context. In absence of a theoretical understanding on the subject matter, this three-tiered analytical framework can assist us in interrogating our military readiness levels in context of the likely 'threats', 'capability' and 'time' dimension.

Ready for What? The expression explains which adversaries should the Indian armed forces be ready to fight against, and under what operational conditions, and according to what military doctrine or strategy.

Ready of What? The phrase explains the military capabilities that might be required to deploy them in times of crises. This will include land, naval and air warfare capabilities both conventional and sub-

conventional, and their inter-se priorities. Maintaining the inter-service balance would be the essence of this exercise.

Ready by When? The phrase explains the potential capability latent in a military force (which includes the country's economic capacity) that can be brought to bear for actual combat needs in times of crises of conflict.

These questions will have to be examined against a wide range of threats emanating in the continental, sub-conventional, and maritime contexts, asymmetric and non-traditional domains, to include out of area contingencies and interventions.

Policy Recommendations: Creating war fighting capabilities takes decades but preserving readiness levels is a greater challenge. Hence, any methodology laid down towards preserving military readiness cannot be limited to dealing with capability deficiencies as they appear, but to logically anticipate and address them. There is therefore a need to lay down a policy framework for institution of a mechanism to compile, analyse and report the readiness levels. These have to be undertaken at three levels:

First, to lay down clear and concise national security objectives to specify the levels of military readiness that India's armed forces must attain, maintain and sustain in the short, to long-term.

Second, to create readiness measurement metrics which is pertinent at the unit and formation level, to assess whether the current and future force structures are able to meet the diverse operational demands.

And third, the framing of responsive readiness monitoring mechanisms to ensure that military readiness receives due attention within the policy circles, both bureaucratic and military, to prompt corrective processes and revised resource allocations.

Readiness Needs: India's readiness needs would be dictated by the military outcomes that the armed forces are expected to deliver. These will have to be determined from the wide range of internal and external threats to include airspace and maritime domain that the security forces might have to handle, in isolation or simultaneously. Simplistically speaking, the Indian armed forces need to maintain calibrated levels of operational readiness against our western adversary, while its readiness objectives along the northern borders, and in the Indian Ocean Region (IOR) and aerospace, have to be more structural and long term. India's dilemma lies in balancing the structural and operational aspects of our readiness needs required by the three services over terrain and space, and myriad security threats.

Readiness Standards and Metrics: Military readiness is usually expressed by looking at resource inputs. These factors only explain what contributes towards building military readiness or capability, but do not sufficiently explain the operational readiness levels at the point of delivery of firepower. Very often, the readiness metrics also focuses only on the frontline units and formations, but does not assess the rest of the military, and since militaries are more concerned with tactical outcomes, the important issue of structural readiness tends to be ignored. Lack of analytical capacities and military-bureaucratic disinterest can undermine the measurement and expression of readiness levels. Even when the military establishment wants to make

an honest attempt, the sheer vastness of technical detail, and its selective compilation by competing interests may result in flawed assessments. Underlying this muddle could be the inability to establish clear terms of reference and standards for measuring readiness.

Several reasons have been ascribed for this inadequacy. Lack of importance to readiness levels, difficulty in formulating credible measurement models and aggregation of reliable data are a few issues. There is a need to frame readiness standards and metrics at three levels:

Unit Readiness: There is a need to specify readiness standards for different types of military units and develop methodologies for estimating how long units take to achieve mandatory levels of readiness. All combat and support units need to report the resources they have or need in terms of men, machines and material (3Ms) to maintain requisite readiness levels, and training standards required to perform an operational role, for which these units are organised and equipped.

Force Readiness: This is a collective measure of the individual, unit and force level readiness capacities, in terms of availability of manpower, equipment and warlike stores, and their ability to mobilise and deploy for operations. Force readiness assessments will have to be specific to specific operational scenarios, over diverse theatre of operations, scale of mobilisation and warning periods. Today, force readiness is at a bi-service or tri-service level, which would entail finding a common operational and logistic planning framework between the three services.

War-time Sustainability: There is a need to continuously assess the availability and reliability of the war fighting material, the ability to mobilise additional personnel, equipment and material, and the country's capacity to induce a surge in defence production. This would involve mechanisms that measure the unit and formation activity levels, consumption and attrition rates, organisational and operational uncertainty, and consistency and adequacy of industrial capacity and support services.

Readiness Monitoring Mechanisms: First of all, there is little doubt that conceptualising, creating and preserving readiness has to be the cornerstone of any national security strategy. The creation of management structures is important to ensure that military readiness concerns permeate all levels of national security decision-making. To ensure congruence, a tiered based readiness management mechanism is recommended. This could be organised as follows:

Defence Readiness Council: This council could be charged with the coordination within the key ministries and agencies that influence readiness related decisions at the highest level. The council chaired by the RM and including the CDS and service chiefs; technology developers, production and procurement agencies; and infrastructure and transportation enablers from ministries of railways, civil aviation, surface transport, national highways and border roads, petroleum and oil, telecommunications, shipping, food and supplies, etc would review the readiness needs and concerns. The council would link the near-term operational needs with long term readiness programmes. The readiness council headed by a service officer will have to be multi-disciplinary to address all men, machines and material related preparedness aspects.

Defence Readiness Committee: This committee could be constituted under HQ IDS and tasked with developing the joint services readiness metrics and criteria. This can be the forum for raising, evaluating and recommending solutions on key military readiness issues raised by the three services. It should be tasked with developing India's readiness criteria, which provide warnings on our future readiness concerns. The committee would be organised and staffed to address issues of manpower, machines, material and infrastructure and mobility needs. The committee could be an adjunct of the directorate dealing with long term capability development plans. The Defence Readiness Committee would also work in concert with the readiness directorates of respective services, and defence related research, production and procurement agencies.

Defence Readiness Sub-Committee: This sub-committee will have to be constituted by each service, to include representatives of the concerned line ministries and agencies, that contribute to operational readiness of respective services. The operational logistic directorates (or equivalent departments) of the respective service headquarters would perform this function. The readiness levels achieved by each service would be evaluated by the sub-committee and based on the assessments made requisite course corrections could be applied.

A fair amount of military understanding already exists amongst the three services, on readiness assessment and reporting mechanisms. However, these assessments being departmental in nature might not satisfy the overall military readiness concerns to meet our national security aims and objectives. India's readiness requirements need to be viewed at each level of military activity, jointly and nationally, to enable realistic assessments and timely course correction. The proposed readiness framework as above would not only explain our required military postures, but also accord greater clarity to strategic thinking in India. More importantly, it would communicate India's readiness concerns to the highest political office and provide a common understanding on readiness related issues at the legislative, executive and service levels. Besides, the Parliamentary Standing Committee on Defence, the Comptroller Audit General (CAG) and other statutory bodies concerned with national security postures would immensely benefit from these assessments. This would call for precise inter-disciplinary skills and staff capacities to undertake readiness related decision making at the national level.

About the Authors

Gautam Sen

Professor Sen is an acclaimed expert on strategic issues and national security, is currently associated with several educational institutions and think tanks. Between 2017 & 2022, he has authored several books, his latest being " Cyber Security & Cyberspace in International Relations: A Roadmap For India's Cyber Security Policy", "National Interest and National Security Policymaking Prism for India", "The Purpose of India's Security Strategy: Defence, Deterrence and Global Involvement and " "National Security Perspectives: A Critical Anthology of Writings by Gautam Sen(Ed by Gurmeet Kanwal)". Apart from this there have been innumerable Research Monographs, Occasional Papers, Manekshaw Papers etc. in the same period.

Presently Sen is Professor Emeritus Policy Perspectives Foundation (PPF), Distinguished Visiting fellow , Centre For Land Warfare Studies(CLAWS), Delhi, Adjunct Professor National Institute of Advanced Studies, Bangalore, Founder Member, Centre For Advance Strategic Studies. Pune. He has been a Member of Standing Committees of the UGC, Member of High Power Committee of the UGC to evaluate the Status of the Discipline of Defence and Strategic Studies taught in Indian Universities, Member of UGC Task force on Five Year Plans and Perspectives and many other memberships of committees set up by various bodies like the Indian Council for Social Science Research etc. Prof Sen has been consulted by members of the Parliamentary Committee on Defence from time to time and been Member of Search Committees for the selection of Vice Chancellors.

Briefly Professor Gautam Sen was Commissioned in the 2nd Battalion of the 3rd Gorkha Rifles(1962-74)of the Indian Army. Sen was Sawarkar Professor of Strategic Studies (1981-2007), Head Department of Defence & Strategic Studies (1981-2001), Director Board of Colleges & University Development (2001-2004) Director National Centre of International Security and Defence Analysis (2002-2007) at the University of Pune. He was Director General and Member Board of Trustees, Indian Institute of Education, Pune (2006-2011), Research Professor National Security Council Secretariat, GoI, Delhi(2015-16). He has been a Visiting Professor at Madras University, Gujrat Vidyapith, Goa University, Institute of Social and Economic Change and UGC Visiting Professor at Gorakhpur University. Air Marshal Subroto Mukherjee Chair of Excellence, United Services Institution, Delhi(2018-21). Sen has also been a FORD FOUNDATION International Fellow at Harvard and Massachusetts Institute of Technology and Twice Fellow at the International Institute of Strategic Studies(IISS), London. Jean Monnet Fellow, European University Institute, Florence, Italy.

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In the 1990s, he headed the Arms Procurement Decision-Making project at Stockholm International Peace Research Institute (SIPRI) in China, India, Israel, Japan, South Korea and Thailand (published by Oxford University Press, UK, 1998). Subsequently, the research conducted in Chile, Greece, Malaysia, Poland, South Africa and Taiwan was published by Oxford University Press, UK. He has been a non-governmental expert in developing the UN Arms Register on Transparency 1994.

As Senior Fellow at the Geneva Centre for Democratic Control of the Armed Forces (DCAF), he worked on NATO Parliamentary Assembly's project on security sector reforms in former Warsaw Pact countries and contributed to the DCAF-IPU publication on legislative oversight of the security sector.

Ravinder Pal Singh led the UNDP Mission on Security Sector Reforms in the Former Republics of Yugoslavia in 2002. Thereafter, he was Senior Fellow at Stockholm University. He has lectured, researched, written and worked across 30 countries on security sector reforms; arms transfer acquisitions accountability; women safety and empowerment; and defence budgets alternatives. These include presentations at the UN Dept. of Disarmament Affairs; New York; United Nations Institute for Disarmament Research (UNIDIR); Geneva; American Association for the Advancement of Sciences; Washington D.C; Transparency International London, on Corruption in Arms Trade, Pugwash Conferences on CSBMs in South Asia; Bonn International Conversion Centre Survey; and Defence & Development workshops at African Union conferences on in Ethiopia, Ghana and South Africa.

At the Arms Trade Treaty (ATTs) CSP5 Conference in August 2019, Ravinder Pal Singh made presentations: one on Universalization and the other on Implementation of the ATT. In the past two years, he has been advising the Inter-Parliamentary Union (IPU) Geneva for the conduct of parliamentary oversight projects.

Harinder Singh

An alumnus of the National Defence Academy Khadakwasla, Lt Gen Harinder Singh was commissioned into infantry, in 1983. In a career spanning four decades, the Officer has seen extensive service in field and on staff at Army Headquarters. He commanded a Rashtriya Rifles Battalion in Jammu and Kashmir, has the distinction of commanding two brigades, the Dera Baba Nanak (DBN) Brigade along the western sector and the United Nations Multinational Brigade in the Democratic Republic of Congo, an infantry division along the Line of Control in Jammu and Kashmir and, very recently, a corps in Eastern Ladakh, where he led the formation during the India-China stand-off along the LAC and Corps Cdr level talks, in 2020. He has also had the privilege of holding the coveted appointment of the Director General of Military Intelligence (DGMI), prior to assuming command of the corps in Eastern Ladakh.

A graduate of the Defence Services Staff College Wellington and National Defence College New Delhi, he carries an abiding interest in strategic – military affairs and has published several monographs, papers and articles in international and national journals/publications. He has also held research fellowships at the Manohar Parrikar Institute of Defence Studies and Analysis(IDSA) New Delhi, S Rajaratnam School of International Studies (RSIS) at Singapore and Asia Pacific Centre of Security Studies (APCSS) Hawaii, USA.

He recently superannuated as Commandant from Indian Military Academy, Dehradun.

Notes

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