INDIAN NAVAL DESPATCH

Winter 2022

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Indian Naval Despatch

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The *Indian Naval Despatch* is published thrice a year and welcomes articles on maritime, defence and strategic affairs.

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FROM THE EDITOR'S 'DECK'

It gives us great pleasure to bring to you *Winter 2022*, the sixth edition of the *INDES*. Our readers may recall that journey of the *Indian Naval Despatch* began on 04 December 2020, with launch of the Inaugural edition on Navy Day that year. As the Chief of the Naval Staff, had then stated in his foreword that, "The vision of *INDES* is truly epitomised by the theme enshrined in the journal's logo viz, '*Lighting Maritime Thought*.' Over course of the last two years - through its six editions, *INDES* has made humble beginnings for achieving this vision through publication of more than 110 articles, papers, book reviews etc., submitted by more than 100 authors. The *INDES* is probably one of the few professional journals, which publishes three editions a year; providing regular opportunity to budding writers and authors to contribute and commence their literary journeys. Publishing works of young author's has been one of our key focus areas, and the Editorial Team takes pride in engaging with these young minds, intellectually pushing and prodding them to improve their expression and writing.

The Winter 2022 edition, once again, like previous editions, brings with it, a wide genre of writings and research, covering the entire spectrum of strategic thought, many of them by '*first time authors*.' The contents include influence of Strategic Culture/ Sun Tzu on the 1962 Indo-China conflict, need for Theatre Commands, strategic power play in the Artic, Admiral Kanhoji Angre, India's SSBN Fleet, China's strategic culture, politics of China-Pakistan Economic Corridor, Indian Naval Satellite Communication, challenges and opportunities in the Central Asian Region, Blockchain and naval applications, inducting technology in leadership, training and human resource management, governance in maritime zones of India and centrality of Aircraft Carriers to India's Maritime Security. Winter 2022 edition also carries three very interesting reviews on recently published books pertaining to nuclear transitions in Southern Asia, Rising to the China Challenge and the Royal Indian Navy mutiny. In the *Rogue's Yarn and Small Stuff*, we have a thoughtful insight into the complex world of Anti-Submarine Warfare; while the section on '*Both Watches*,' which is gradually emerging as a vibrant platform for interaction between readers, authors and the Editorial Team, sees interesting feedback and comments from patrons of the *INDES*.

Our readers would also recall that the Indian Naval Despatch

Foundation or INDEF Website was launched during conduct of the Goa Maritime Conclave 2021, an apex level maritime engagement initiative of the Indian Ocean Region organized by the Indian Navy. The website has truly been a force multiplier in our outreach efforts to improve the journal's readership and has witnessed more than 18300 visitors since its launch in November 2021. We are constantly engaged in the process of improving reader experience and functionality of the website. This includes the creation of an email with the Websites' domain name, which is contactus@indesfoundation.in. The Winter 2022 edition, is also unique as it carries the first advertisement by a sponsor, which in this case is the Mazagaon Dock Shipbuilders Limited (MDL). We are indeed proud to partner and showcase MDL's repertoire and global standing as a leading shipbuilder of India. We are hopeful that many more leading organisations and enterprises will come onboard to support our efforts for '*Lighting Maritime Thought*.'

Our Editor-in-Chief, RAdm Shrikhande (Retd) has taken a short sabbatical from the Winter 2022 edition, as he is preoccupied with pursuing his Doctorate. He will be back with us for the Spring 2023 edition. The 'call for contributions' for the Spring 2023 edition is out. For our previous editions, we are thankful to our authors and writers who with their response have posed a significant editorial dilemma on selecting articles from so many submissions, due to the 'space and page' factor; a pleasing 'constraint' for the Editorial Team of any journal.

We hope that you enjoy reading the Winter 2022 edition of the *INDES*, as much as we enjoyed compiling it. Needless to say, the views expressed in this journal are solely of individual authors, and do not represent or reflect any official policy or position of any organisation, either government or private. As Dan Schulman, the CEO of Paypal famously said, '*the biggest impediment to a company's future success is its past success*.' We, therefore, look forward to receiving valuable feedback and suggestions for inclusion in the *Both Watches* section to improve the follow-on editions of the *INDES*. In the end, we would like to express our heartfelt gratitude to all authors for contributing their valuable articles as well as to all those who facilitated in publishing of this journal.

We wish you 'Happy Reading' and 'Keep Writing' in 2023.

The *INDES* Editorial Team

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BOTH WATCHES

INDIGENISATION OF INNOVATION IS THE MANTRA

This comment has been received from Capt Srinivas B Inje, who belongs to the Indian Navy's Naval Armament Inspectorate Branch, on the article, 'Innovate to Dominate' written by Cdr Alekh Agrawal, published in the Indian Naval Despatch Monsoon 2022 Edition (pp 69-81).

Enough is said and deliberated on Indigenisation in Defence Industry in numerous forums but as quite rightly alluded by Cdr Alekh Agrawal in his article, Indigenisation alone will not suffice to achieve self-reliance in Defence Industry unless innovation becomes an integral part of its ecosystem. Innovation and credible R&D are undoubtedly the crucial areas the Nation needs to focus on for mitigating foreign OEM dependence.

The critical discourse by the author on the effectiveness of the Defence Innovation Organisation (DIO) resonates with the pulse of the present-day Defence Manufacturing Industry which is often left with no choice but to rely on foreign OEMs for critical technologies despite the Transfer of Technology (ToT) agreements in place. A potent manufacturing industry supported by indigenous Innovation allows for the development of new and

advanced technologies that can give the country's Defence Industry a competitive edge to emerge and flourish as a global defence exporter in future.

ETHICAL FRICTION IN THE FOG OF WAR: A STUDY OF ETHICAL CONDUCT IN WARFARE

This observation has been received from Capt Suraj James Rebeira, a Navigation and Direction specialist, on the article 'Ethical Friction in the Fog of War: A Study of Ethical Conduct in Warfare' written by RAdm AD Nair, VSM published in the Indian Naval Despatch Monsoon 2022 Edition (pp 20-33)

The true story of Commander (later Vice Admiral) James Bond Stockdale, USN sets the tone and basis on which RAdm AD Nair in his article, poses the fundamental question of whether all leaders today are ethically prepared to face unpredictable combat challenges in future. In doing so, the author analyses how laws of armed conflict have evolved with examples from history. He goes on to draw parallels between Indian traditions with that of western theories. The need for ethical conduct in battle is mandated by every soldier and the article suggests what could be done better to imbibe this quality through military education as well as training.

There is a subtle difference between 'ethical dilemmas,' where it is hard to find out what the right thing to do is, and 'tests of integrity,' where it is hard to do the obvious right. This difference demands not only clarity but also an in-depth understanding by all military leaders. Often the two are mixed up and with more years served in uniform, the acceptable '*Lakshman Rekha*' on 'tests of integrity' may either get blurred or might shift conveniently, underpinned with a sense of entitlement which comes along with rank. While maintaining the highest integrity is a given and pre-requisite in the military, it requires constant self-restraint and conscientiousness in practice. On the other hand, the art of resolving 'ethical dilemmas,' the author says, is honed with education and by continued focused readings. The author suggests that 'ethics can be taught

and learnt at any stage,' and emphasis on such education is necessary at every phase of any military career.

The understanding of western ethical concepts of deontology, consequentialism and virtue ethics through the lens of Indian traditions is an interesting read in the article. In doing so, he quotes *Ramayana*, *Mahabharata* and *Arthashastra* to better understand these western concepts, but also throws caution, to be not over-interpreted by young officers, considering that some of our writings are on matters of state-craft and not purely on ethical conduct. The author suggests the use of 'ethical triangulation,' which carefully balances these three concepts, superimposed with practical wisdom which is equally essential to arrive at sound ethical decisions.

Meanwhile, it may be of some value to readers that the Australian Defence Forces (ADF) published its first edition of the 'Military Ethics' doctrine in September 2021, with the purpose of it being a foundational document for an ethics continuum, individual education and training. In its aim, the document states that "while authoritative, the doctrine requires judgement in application." Is there a need for such a document in the Indian Navy? The jury is out on this question, but it is opined that healthy debate based on sound knowledge and understanding of ethical theories is essential for us in the military. That said, any discussion on ethics could perhaps tilt heavily towards a subjective understanding, unless such publications (e.g., ADF doctrine) articulate what the organisation expects across all levels.

In the Indian Navy, the Centre for Leadership, Ethics and Behavioural Studies (CELABS) is the cradle where formal education on ethics and leadership commences, and the author in this article rightly identifies, that there is a need to overcome the 'blink and you miss it' approach during mid and senior level refresher capsules. Experiential learning through 'flipped classroom' and gaming are models that have been introduced at CELABS, and could intangibly inculcate desired behavioural conduct. Meanwhile, as the author queried, are our Academies shaping young cadets suitably to face future ethical challenges? Do we have scientific methods to inject the right kind of behaviour education to prepare our officers across all levels to make the hard choices between 'right and right' and the 'right and wrong'? There is, of course, adequate room for introspection and scope to alter course to avoid shoal waters.

DEFENCE IoT APPLICATIONS - CREATING THE PROVERBIAL UBIQUITOUS NETWORK

This viewpoint has been received from Capt Vikram Ahuja, an Electrical Engineer by specialisation, on the article, 'Defence IoT Applications - Creating the Proverbial Ubiquitous Network' written by Capt Ramraj Verma, published in the Indian Naval Despatch Monsoon 2022 Edition (pp 130-146).

The objective of this review is to further the author's argument on the opportunities of defence applications of IoT. Rapid advancements in the IT domain have led to an internet revolution and an intellectualised environment, diminishing the limitation of time and space.

The ubiquitous roadmap for IoT networks illustrated in the article includes both Internet of Battlefield Things (IoBT) in C4ISR and intelligence gathering. A matter of consideration can be an IoT coupled with AI as a resource for the management of the Service Vehicle Fleet, augmentation of vehicle health management system, ability to quickly forecast failure in components of the fleet, facilitate location monitoring and incorporate a capability of interactive traffic route management. In furtherance of the GoI's Defence Artificial Intelligence Council (DAIC) created as part of the *Aatmanirbhar Bharat* initiative, IoT applications can truly serve as an able platform for setting up smart Naval bases to provide innovative solutions for enhancing security, mobility, energy conservation, weather monitoring, healthcare and infrastructure management.

The author has amply demonstrated capabilities of various IoT enablers for omnipresent network connectivity and recommended solutions that are best suited for Defence IoT i.e. 6LoWPAN, Dash7, Wi-SUN and NB-IoT technology. Some aspects which need further understanding are the architectural framework, Security/privacy overlay and technology imperatives. Whilst the user would largely be convinced of many advantages of IoT, these three verticals require a customised application for the military and specifically for the Navy. To substantiate this, these aspects have been discussed below.

For instance, IoT is an excellent tool and has multifarious modules for

application ashore. It would, however, be appreciated that the proliferation of IoT on board ships and frontline platforms will have myriad nuances which would be different from the already existing framework ashore. This would include permission to use wireless networks onboard ships necessitating a transformational change in operations.

At the technological level, certain key imperatives envisaged for IoT implementation are the sheer numbers, variety and requirements of interoperable devices which will need to be connected to the internet. Considering rapid pace of innovation in the IoT domain, it may be difficult to ensure consistent, reliable and secure communication between these devices. Hence, in order to suitably leverage various advantages of IoT, manufacturers will require to develop and adopt common standards, as well as protocols for different devices to communicate and operate seamlessly. Also, a defence IoT application will have to mandatorily incorporate access control, authentication, enhanced resilience to cyber attacks and client privacy as part of the manufacturer's business model.

In essence, this thought-provoking article has set the tone for the Navy to invest both time and energy in this niche technology so as to harness its full potential. With a realistic understanding of the technology and impending challenges, IoT has the potential to accrue benefits by taking advantage of big data analytics, deep learning, quantum and nano technology for military operations.

WILL CHINA'S DIGITAL CURRENCY BREAK THE DOLLAR'S MONOPOLY AND ITS IMPLICATIONS FOR INDIA

This reflection has been projected by Shri Shrish Pratin Pattalwar, a qualified Mechanical Engineer, a budding entrepreneur and a geopolitics buff, on the article, 'Will China's Digital Currency Break the Dollar's Monopoly and its Implications for India' written by Capt PK Yaduvanshi, published in the Indian Naval Despatch Winter 2021 Edition (pp 101-115).

It cannot be doubted that we are witnessing the rehashing of history in Europe with the Russia-Ukraine conflict and its cascading impact on the world economy has been nothing short of seismic. As pointed out by the author, the US has wielded its hegemonic sword in the economic sphere since end of the Second World War and the Bretton Wood institutions have helped it consolidate the American dollar's reach over far corners of the world. As such, it came as a surprise to many when the economic sanctions on Russia spectacularly backfired and revealed an almighty chink in the American armour. Instead of crippling the Russian economy, the sanctions have created havoc in developing and least-developed economies, many of whom are US allies and partners.

China, the subordinate superpower, sees an opening for itself and rightly so. Since the days of Deng Xiaoping, China has seen nothing but exponential growth and prosperity. Today, with an $18.5 trillion GDP, it continues to log an astonishing 6% yearly growth rate. The author says that if historical evidence is to be relied upon, then the life span of a reserve currency is no more than 100 years and as such time is ripe for a transition away from the US dollar. China is best placed to take advantage. This sentiment has been echoed consistently by experts across many platforms.

Personally, this talk of an impending demise of the US-led system seems a bit premature for the simple reason that the world economies are much more integrated and interconnected than before and the American dollar is one of the binders which cements these relationships. As the author points out, for any currency to become a standard, a large and growing domestic economy, substantial and open capital markets, and effective institutions to manage the economy and markets are a must. China has made rapid strides in all these areas, but it falls short of transparency and trust which is a must when markets and investors look at long-term stability. Xi Jinping, with a Maoist rather than Deng Xiaoping-type approach to the Chinese economy, may yet prove to be another impediment to continued Chinese prosperity.

With the democratization and the exposure offered by the digital commons, the economic system will invariably move away from the US domination but it will be a long and drawn-out process as the US will not give up its cash cow easily. The arrival of the Central Bank Digital Currencies (CBDC) is a step in the right direction vis-à-vis leveraging Blockchain Technology. Cryptocurrency, another digital product based on

Blockchain, has proven to be a mirage and is rightly being banned by Central Banks across the world.

India, as an emerging superpower, at this juncture finds itself in a bit of a predicament. Although exports have rebounded, India remains primarily an importing country with both the US and China as her major trading partners. As such, she cannot do away with her dependence on the dollar nor can she substitute her trade deficit with China overnight. In this context, I concur with the author when he says that India should work with like-minded countries to promote innovative technologies and help each other become truly '*Atmanirbhar*.'

INFLUENCE OF STRATEGIC CULTURE / SUN TZU ON CHINESE ACTIONS IN THE 1962 INDO-CHINA CONFLICT

Commander Gaurav Deshpande

"The different measures suited to the nine varieties of ground; the expediency of aggressive or defensive tactics; and the fundamental laws of human nature; these are things that must most certainly be studied."
– Sun Tzu, Art of War (p.65)[1]

Introduction

The title of an essay writing competition organised by the Indian Army Headquarters Northern Command in November 2022 reads as 'Future Battlefield: Need for the Techno Commanders.' The theme revolves around the concept that 'contact and kinetic operations have passed on their primacy to non-contact and non-kinetic' and that 'the exponential outcome of technology integration has led to new warfighting methodology - attrite enemy without fighting and defeat enemy well before the onset of kinetic warfare.'

The interesting fact is that the problem, we as armed forces are seeking to understand and resolve, was already echoed by the Chinese General Sun Tzu, 2500 years back! Sun Tzu in his military classic, *The Art of War*, said that a skilful General attacks by stratagem,

"To fight and conquer in all your battles is not supreme excellence; supreme excellence consists in breaking the enemy's resistance without fighting."
"In war, the victorious strategist only seeks battle after the victory has been won, whereas he who is destined to defeat first fights and afterwards looks for victory."

This makes one ponder... are we still dealing with the problems of the past? Are we trying to seek solutions for the future? Are we overestimating the status of weapons and technology? Does the key to our problems lie in the past? Sun Tzu offers implications to the solution of the above-

mentioned dilemma in the chapter 'The Sheathed Sword,' wherein, he says,

"The sheathed sword describes the analysis and preparation for war while considering the physical, economic, and psychological aspects and use of non-destructive methods like stratagem over destructive ones."

The concept note of the essay competition also states that the "exponential outcome of technology integration has led to new warfighting methodologies" and that "technology has assumed an altogether new and disruptive dimension." But has it done so? The ongoing Russia - Ukraine conflict is the latest example of a conventional war, wherein, most of the powerful militaries of the world are either directly or indirectly involved. However, one may think, what has been the disruptive factor in this modern-day war, which did not exist in previous conflicts? Tanks, aircraft, ships, missiles, satellite surveillance, cyber warfare etc, all have been used during previous conflicts; with obvious exceptions of improved speed, range and effectiveness of these weapons and platforms. Even drones, such as 'Firebee,' were used during the Vietnam war, the US invasion of Afghanistan in 2001 and the Azerbaijan - Armenia war of 2020. This leads to a conundrum for military leaders - are 'future wars' really going to be very different from what they used to be in the past? Or are they the same death and destruction wrapped in newer wrappers of technology?

Centre of Gravity. Technology is a tactical aspect and will continue to evolve. It is once in a blue moon that development of revolutionary technology such as radar, nuclear weapons etc. decisively changes the outcome of a war. Despite this, world militaries inevitably continue to focus more on technological capabilities than on cultivating strategic thinking of its military leaders. One reason for this could be that pursuing advanced technology is more glamorous as compared to developing strategic thinking. Between a game of Chess and a virtual war-game simulation, which would be a preferred choice for a modern-day military leader? However, it is pertinent to note that the one factor which has always remained constant in any war and will continue to be so, is the man/ woman behind the machine/weapon. Even unmanned crafts/weapons are controlled/programmed by a human. Thus, the Centre of Gravity for all warfare as is evidenced through history and in future, will always remain the soldier and his psychology.

Strategic Culture. Professor Alastair Iain Johnston, an expert in Chinese Foreign Policy and International Relations at Harvard, defines Strategic Culture as "consistent and persistent historical patterns of the way states think about the use of force to achieve political ends." The way different states conduct politics and strategy are not uniform; they differ in orientations, attitudes, predispositions and proclivities. In his book, *Cultural Realism-Strategic Culture and Grand Strategy in Chinese History*, he has researched the effect of Strategic Culture on Chinese decision-makers with encouraging results. This means that deeply rooted cultural preferences exert a significant influence on strategic choices made by a nation.

Factors Influencing Strategic Culture. The tactical disposition of available technology by higher leadership in China would depend on the thought process of decision-makers, which is influenced by generations of cultural conditioning. Thus, it is prudent that military leaders of rising world powers (such as India), should focus on understanding the psyche of their counterparts, whilst enhancing their strategic thinking, to stay ahead in the game. Strategic culture is developed over generations and is influenced by popular literature and teachings, which in the case of China includes Sun Tzu's *Art of War*, Confucius and *The Seven Military Classics*, among other eastern philosophies.

Military leaders of rising world powers should understand the psyche of their counterparts

Sun Tzu's *Art of War*. As a proof of concept, the ingenious theory of cultural conditioning is explored in this article by reviewing Chinese actions during the 1962 Indo-China conflict through the lens of Sun Tzu's *Art of War*. Sun Tzu, a Chinese General believed to have lived in 300 BC, wrote the timeless masterpiece on warfare and statecraft, which was translated by US Journalist James Clavell. The book provides an excellent philosophical read and is considered relevant even today. Clavell states that Sun Tzu is obligatory reading in the Russian political-military hierarchy and has been the source of Mao Tse-tung's *Little Red Book* of strategic and tactical doctrine.[2]

The USI paper, 'The Real Story of China's War on India, 1962' by Mr A K Dave IP (Retd) has provided a concise analysis of the diplomatic and intelligence aspects of the 1962 conflict. The narrative is akin to a primary source as he has represented the Intelligence Bureau (IB) in the Joint

Intelligence Committee (JIC) during the 1962 conflict and has based his research primarily on the papers issued by the Government of India, viz 'History of the Conflict with China, 1962.' Further, relevant extracts are taken from books and articles by renowned authors who were closely associated during the unfolding of the 1962 conflict.

This article aims to deduce the influence of Strategic Culture on Chinese actions during the 1962 conflict, primarily focusing on principles of the *Art of War*. The structure broadly consists of an overview of Sun Tzu's teachings and the Indo-China border dispute, followed by the genesis and course of the 1962 conflict viewed through the lens of Sun Tzu's teachings. The author has used his judgment to bring out in this article, how Chinese actions in the 1962 conflict seemed influenced by Sun Tzu's teachings. Further, we cannot absolutely affirm that the Chinese leaders were exclusively influenced by the *Art of War* alone. The influence of other military philosophies and various other factors of space, time and force cannot be neglected. Here, the *Art of War* represents all such philosophies, which combine to form the strategic culture.

Art of War represents all philosophies, which combine to form strategic culture

Overview of Sun Tzu's Art of War

Art of War consists of thirteen chapters. Chapters One, Two and Three pertain to "Laying Plans," "Waging War" and "The Sheathed Sword," which describe the analysis and preparation for war, while considering the physical, economic and psychological aspects and use of non-destructive methods like stratagem over destructive ones. Chapter Four, "Tactics," discusses real situations that could occur in a war and the methods to deal with each. Chapter Five, "Energy," discusses ways for maintaining the energy of soldiers. Chapter Six, "Weak Points and Strong," is about military tactics, such as the time to advance or to retreat, the tactics of outflanking and using scattering on the battlefield to create a false appearance to confuse the enemy. How to defeat your enemy with fewer troops is a core topic in this chapter.

Chapters Seven, Eight and Nine, "Manoeuvring," "Variation in Tactics" and "The Army on the March" respectively introduce principles and methods for transforming disadvantages into advantages and how to adjust strategies for different enemies. Chapters Ten and Eleven, "Terrain" and

"The Nine Situations," mainly discuss how to take advantage of geography. Chapter Twelve, "The Attack by Fire" refers to the use of fire in war scenarios, which has evolved to have a modern connotation. Chapter Thirteen, "The Use of Spies" introduces five kinds of spies who can serve as the eyes and ears of an army.

Border Dispute and Conflict of Interests in 1962

A historical territorial dispute has existed between China and India over the Tibet Plateau (Ladakh region). India claimed Aksai Chin based on various treaties signed between Indian/British rulers and the erstwhile Tibetan government. Notable among these was the treaty of Chusul signed between the Tibetans and Gulab Singh (ruler of Punjab, J&K) in 1842.[3] Another important treaty was with the British in 1904 during the Anglo-Tibetan convention of Lhasa.[4] Subsequently, China captured East Turkestan in 1949. The border dispute with China flared up after the tripartite Shimla convention of 1914, signed between Tibet and British India, as the Chinese representative refused to sign it. This agreement outlined Tibet into inner and outer Tibet and China was denied interference in Inner Tibet. It also designated the McMahon line as the demarcated border between India and Tibet.[5] China claimed that the demarcation of the McMahon line illegally included parts of Tibet (claimed by China) into British India. Post-formation of the Chinese Communist Party (CCP) in 1949, China stated that Aksai Chin was a disputed territory.

Laying Plans - Chinese Approach to Border Dispute

The Utmost Priority. Sun Tzu says that a country should place national security above any other issue. He says,

> *"The Art of war is of vital importance to the state. It is a matter of life and death, a road either to safety or ruin. Hence, under no circumstances can it be neglected." – Sun Tzu, Art of War* (p.9)

The Chinese leadership, according to Sun Tzu's teachings, realised the significance of the Tibet region towards its sovereignty and national security. China perceived India (with assistance from the US) as a threat to its rule in Tibet.[6] Thus, the Chinese had an unwavering commitment towards resolving their territorial claim of Tibet, if required, by force. This

was evident from the words of Chinese Deputy PM, FM and member of Politburo, Marshal Chen Yi, on 03 Aug 62 on air in Switzerland, "No power on earth could make China withdraw from its territory."[7] Further, Chinese Premier Zhou Enlai officially expressed that "India was naïve to expect China to negotiate regarding national security."[8] Enlai's surprise indicates that a non-negotiable stance on national security is such an obvious perspective of China that India should have known it. The fact that this perspective is a mirror image of Sun Tzu's teaching indicates that Strategic Culture as influenced by Sun Tzu shaped Chinese decision-making, and the awareness of this correlation could have helped us judge the Chinese response to Nehru's 'Forward Policy' better.

Calculations. Sun Tzu says that consequences of war are devastating for any country, whether victorious or defeated. Thus, all factors and strategies need to be carefully evaluated to prevent undue death or destruction. He says,

> *"The General who wins makes many calculations in his temple before the battle is fought. The general who loses a battle makes few calculations beforehand." – Sun Tzu, Art of War* (p.11)

In 1949-50, China annexed Tibet. India provided asylum to Dalai Lama in 1959, which greatly annoyed the Chinese.[9] Mao Zedong suspected that Nehru had devious plans w.r.t Tibet with US assistance, as Nehru strongly advocated autonomy of Tibet instead of Chinese sovereignty over it. India's rise as a democratic nation and Nehru's popularity in the non-aligned movement further irked China. Finally, China sensed the rising Geopolitical tensions on both Taiwan's front (along with Japan and the USA) and India's front due to the 'Forward Policy.' Hence, China carefully undertook these strategic calculations, as also advised by Sun Tzu, and decided to secure the Indian border by use of force. Chinese Premier Zhou Enlai announced that the goal of Beijing was to "punish India's aggressiveness and create conditions for possible future negotiations."[10]

Subduing the Opportunistic Neighbour. China also appreciated that the Soviet Union (the opportunistic neighbour), could take advantage of China's conflict with India by opening another front with China.

> *"Never forget, when your weapons are dulled, your ardour dampened, your strength exhausted, and your treasure spent, other chieftains will spring up to take advantage of your extremity."*
> *– Sun Tzu, Art of War* (p.12)

Moscow was displeased with Chinese aggressive acts along the Indian border and Khrushchev prevailed upon Chinese leaders to settle the conflict with India through negotiations.[11] However, assessing that the Soviet Union (*the other chieftain*) was in the thick of a Cold War with the West (which led to the Cuban Missile Crisis of October 1962), the Chinese strategically and diplomatically subdued the Soviets, such that they did not directly support India in the Indo-China conflict till December 62.

Perception Management. Sun Tzu advocated the use of combinations of direct and indirect methods in designing tactics or strategies. Direct methods are straightforward tactical or diplomatic actions, but indirect actions are deceptive and unconventional ways to achieve strategic goals. Thus, Sun Tzu says,

> *"In all fighting, the direct method may be used for joining battle, but indirect methods will be needed to secure victory."*
> *– Sun Tzu, Art of War* (p.21)

China progressively lodged direct protest notes with the Indian government, whilst indirectly garnering international support. The success of this indirect strategy is evident from the fact that the Australian author Neville Maxwell has titled his book *India's China War*, despite Chinese encroachment into Indian territory. Citing that China was defending against India's assertive border approach, he stressed that India should 'unequivocally and publicly withdraw all fictitious and false claims on Chinese territory.'[12] In 1956, China began its policy of steady encroachment in Ladakh and NEFA, nudging India to inevitably defend its territory, under the incorrectly titled 'Forward Policy.' Concurrently, China waged a psychological campaign in setting the international stage that India had no case for its defined boundary and that India was the aggressive party. These events are textbook examples of the use of Direct and Indirect strategies, as advocated by Sun Tzu.

Deception. One of the most prominent teachings of Sun Tzu is the use of

deception in warfare, to the extent that he says

"All Warfare is based on Deception." – Sun Tzu, Art of War (p.11)

This was evident in Chinese actions, as within two months of adopting the Five Principles of Peaceful Coexistence, namely *Panchsheel* (the Peace Proposal), in 1956 and projecting a friendly approach towards India, China started intrusions across the Indian border. Chinese Premier Zhou Enlai gave the impression to Nehru that China would recognize the McMahon Line, but did not make any absolute commitment. On the other hand, in January 1959, China through an official note conveyed that the Xinjian-Tibet highway (increased preparations) had been built within Chinese territory (Aksai Chin) as no formal delimitation or treaty existed. Knowledge of Sun Tzu's teaching could have enabled us to be open to the possibility of ulterior motives of China. On the contrary, heeding the counsel of Sun Tzu could have helped us decode the enemy's deception,

"Humble words and increased preparations are signs that the enemy is about to advance. Peace proposals unaccompanied by a sworn covenant indicate a plot." - *Sun Tzu, Art of War* (p.44)

Targeting the Higher Leadership. On 07 November 1950, a month after China's new communist regime invaded Tibet, India's deputy PM Sardar Vallabhbhai Patel wrote to PM Nehru acknowledging that "*The Chinese government has tried to delude us by professions of peaceful intentions (wrt Tibet issue). Even though we regard ourselves as friends of China, the Chinese do not regard us as their friends*."[13] Nehru had supported China's entry into the UN, but the Chinese seemed to have remained suspicious of the US-India threat in Tibet. It seems that the Chinese adopted the following strategy when dealing with the enemy's highest leadership.

"A whole army may be robbed of its spirit; a Commander-in-Chief may be robbed of his presence of mind." – Sun Tzu, Art of War (p.33)

This strategy is witnessed on numerous occasions, for example, Beijing pretended to treat Nehru as a friend. Post the *Panchasheel* agreement, Nehru even promoted the slogan "*Hindi-Chini Bhai-Bhai*." After the

Geneva conference of 1954, the Chinese People's Daily wrote, "India and China are fighting against the old colonialism, side by side."[14] Such false narratives and assurances led to a lack of preparedness due to the complacency that the Chinese will not attack India. Later when they did attack, it left Nehru feeling shocked and betrayed, which could have affected his presence of mind and decision-making.

Duration of War. Sun Tzu was strictly against prolonged campaigns and laying siege. He said,

> *"In all of history, there is no instance of a country having benefited from prolonged wars. It is only one who is thoroughly acquainted with the evils of war who can thoroughly understand the profitable way of carrying it on." – Sun Tzu, Art of War* (p.13)

The Chinese campaign in 1962 was short and swift, following Sun Tzu's principle. China considered the economic consequences of prolonged war and the logistics and operational difficulties involved due to inclement winter weather setting in shortly. China thoroughly planned for a prolonged duration, but executed the actual war within a short span (19 October - 21 November 62), after which it withdrew unilaterally.

Inclement Weather. Sun Tzu explains that at the tactical level, the considerations of time, space and force need to be carefully compared with that of the enemy. He says,

> *"Art of War is governed by five factors, namely Moral Law, Heaven, Earth, the Commander, Method and discipline. Out of which, Earth signifies terrain and Heaven signifies night and day, cold and heat, times and seasons. A general who carefully evaluates these factors will be victorious, as to with whom lies the advantage derived from Heaven and Earth!"*

Retired Subedar Kapur Singh, a 1962 conflict veteran recalls, "Chinese counterparts had superior quality guns and ammunition, had the advantage of numbers at high altitude and were also native to the hilly region." According to him, the Indian soldiers were freezing in extreme weather while the Chinese were comfortable. In the high-altitude battle zones, even food and water were luxuries. On one occasion, they got food after 10 days

of trekking in the hilly region.[15] This recount is a testament to the fact that the Chinese had better evaluated and prepared for the inclement weather (Heaven), in keeping with Sun Tzu's teachings.

Able General. Sun Tzu placed substantial weightage on the competency and knowledge of a General in the outcome of any war and thereby, the security and stability of the country. He stated,

"The Commander stands for virtues of wisdom, sincerity, benevolence, courage, and strictness."
– Sun Tzu, Art of War (p.9)
"The natural formation of a country (terrain) is a soldier's best ally."
– Sun Tzu, Art of War (p.53)

China appointed the most capable and best-suited general, Zhang Guohua, who was well-versed in Tibetan culture, to lead the campaign. He possessed vast experience being part of all major Chinese conflicts since 1929 and was in charge of the annexation of Tibet in 1950-51.[16] Thus, China followed Sun Tzu's guidance and appointed their most 'able general' who was well acquainted with the terrain involved in the Indo-China conflict, as compared to other generals.

Restrict Intelligence. Sun Tzu emphasised harnessing non-kinetic means such as intelligence gathering, whilst denying the same to the enemy. He advised that,

"On the day you take up your command, block the frontier passes, destroy the official tallies, and stop the passage of all emissaries either to or from the enemy's country." *– Sun Tzu, Art of War* (p.72)

Chinese seemed to have followed this counsel, because after the annexation of Tibet, China made it impossible for the Indian Consulate General and Trade Agencies to function inside Tibet. The staff were left without even a wireless communication facility. Whereas Chinese trade agents had free access to the local Tibetans and Chinese nationals for trade, intelligence and covert activities in India.

Secrecy of Plans. Sun Tzu proposed a way to keep own forces on their toes, whilst denying enemy spies within own troops to effectively communicate intelligence in time. He suggested,

"To prevent treachery, your arrangement should not be divulged beforehand. Confront your soldiers with the deed itself, never let them know of the design." – Sun Tzu (p.69)

Chinese Commanders did not reveal the real intentions of political leadership to their soldiers before the battle, to mislead possible spies. Prior commencement of the war, the soldiers were informed that their government was making all efforts to resolve the dispute peacefully and that the Chinese would not be the ones to fire the first shots at the border. However, Mao Zedong later declared that "We must fight the inevitable war with India." The Chinese made substantial infrastructure along the border with troop build-up, but the efficacy of maintaining the secrecy of plans by the Chinese was evident from the words of Prime Minister Nehru in his address to the Principle Staff Officers at AHQ on 03 November 1962, where he said, "We did not have an idea of the massiveness of their (Chinese) preparations."[17]

Build-up to the War

Provocation till Revelation. Sun Tzu advocates carefully probing the enemy to assess his capacity, capability and response and to devise own strategy accordingly.

"Rouse him to reveal himself, to find out his vulnerable spots. Carefully compare and analyse the opposing army to our own. When able to attack we must seem unable, when using our force, we must seem inactive. Violent language and driving forward as if to attack are signs that enemy will retreat." – Sun Tzu, Art of War (p.28)

This way, you would deduce the enemy's strengths and vulnerabilities, while keeping the enemy guessing. A similar strategy was employed by the Chinese. Their encroachment inside the border led to multiple armed skirmishes on various border posts, i.e. Ladakh and NEFA sector. It is pertinent to note that on numerous occasions Chinese troops approached Indian posts/patrols or surrounded a post shouting aggressively (driving forward with violent language), only to retreat later. The Chinese had earlier also objected to the establishment of an Assam Rifles Post at Khenzamane in 1959 by surrounding it and then withdrawing after a few days. It seemed

like a strategy to assess the strength and capabilities of the Indian troops at various locations. Once confident of overcoming Indian retaliation, the Chinese forces overran our post at Longju, NEFA on 26 August 1962 and Kongka LA in October 1962, just east of our post at Hot spring. China claimed both areas were within Chinese territory, while they lay 40-50 km inside Indian territory.

The Trigger Point. Chinese fortified both their Eastern and Western flanks along the Indian border before the attack. The Indian posts set up under the wrongly named "Forward Policy" were non-aggressive in nature. Thus, Mao waited and watched for any significant aggressive move by India. This aligned with the following principle of Sun Tzu -

> *To secure ourselves lies in our own hands, but the opportunity of defeating the enemy is provided by the enemy himself – Sun Tzu, Art of War* (p.19)

However, even the Chinese sympathiser, Australian Journalist Neville Maxwell quoted in his book that, "To say that the Indian troops in the Western sector launched a general attack from their puny posts was grotesque."[18] Setting up of the Dhola post on 04 June 1962, 4 km South of Thangla, north of the McMahon line by transposition, was used as a major incident (or the opportunity of defeating the enemy) by the Chinese to justify commencement of the war.

Phase I of Hostilities: 19 October - 16 November 1962

Shuai-Jan. Sun Tzu says that a skilful tactician may be likened to the Shuai-jan, a snake that is found in the Chang mountains, for the following unique feature,

> *"Strike at its head, and you will be attacked by its tail; strike at its tail, and you will be attacked by its head; strike in its middle, and you will be attacked by head and tail both. Asked if an army can be made to imitate the Shuai-jan, answer yes." – Sun Tzu, Art of War* (p.63)

Heeding this advice, on the night of 19/20 October 1962, the Chinese launched simultaneous attacks on eastern and western fronts (head and tail) of the Indo-China border, under the pretext that India has launched a full-

scale offensive. Overwhelmed by the multi-front attacks, the offensive in the Western sector more or less stopped at their claimed line of 1960, with the Chinese overcoming the resistance shown by various Indian posts by 24-28 October 1962. This resulted in victory for the Chinese while preventing possible enemy regrouping.

Hold out Baits. Sun Tzu advises offering the enemy suitable tempting propositions, especially after gaining some leverage. Accordingly, China repeatedly offered Nehru to consider a ceasefire, but on Chinese terms.

"A clever combatant by holding out advantages to him (enemy), he can cause the enemy to approach of his own accord by enticing him with a bait." – Sun Tzu, Art of War (p.25)

However, Nehru was resolved towards the withdrawal of Chinese troops till the pre-aggression line, before any negotiations could take place. On 12 November 1962, Zhou Enlai's again put forth a peace proposal (bait) to India, to give up its claim on the Akshai Chin; in return of which, China would forego claims in the NEFA region. The same was rejected by Nehru who was unwilling to cede any part of Indian territory, convinced that the claim of China in both regions was false.

Phase II of Hostilities: 17 November - 21 November 1962

Use of Spies. This aspect of Sun Tzu's teaching is perhaps the most relevant even today. He says that a nation should not hesitate to spend on intelligence and explains its significance as follows: -

"What enables the wise sovereign and the good general to strike and conquer, and achieve things beyond the reach of ordinary men, is foreknowledge. Now, this foreknowledge cannot be elicited from spirits; it cannot be obtained inductively from experience, nor by any deductive calculation. Knowledge of enemy's disposition can only be obtained from other men (spies)." – Sun Tzu, Art of War (p.77)

Accordingly, it seems that the Chinese had acquired intelligence of Indian preparations for Phase II of the conflict, which commenced on 17 November 1962. Thus, they proactively started executing counter-measures between 10-15 November 1962 to encircle the Indian forces. This

was evident when the Indian forces commenced their operation on 17 November 1962 as they found themselves surrounded by the Chinese 166th Reg, while the Chinese 165th Reg attacked adjoining Indian Posts on 17 November 1962.

Enemy Within. Per Sun Tzu's teachings, the Chinese leveraged every possible opportunity to implode the Indian side using their influence on the Indian people. Sun Tzu says,

"Spies are a most important element in war because upon them depends an army's ability to move." – Sun Tzu, Art of War (p.82)

"Use inward spies (with vested interests in enemy's country) to disturb the harmony and create a breach between the sovereign and his ministers." – Sun Tzu, Art of War (p.78-79)

The Chinese Communist Party pressurised the Communist Party of India (CPI) to instigate a 'Peasant's armed revolution' for 'People's Democracy' in India.[19] China also instigated the Indian media to spread propaganda and create turmoil against the Indian government, especially Nehru.[20] Accordingly, the Communist Party of India propagated that 'it was Nehru who had sanctioned the attack on the Chinese and the Chinese had given him a suitable rebuff.'[21] It was also observed that the details of critical high-level political-military meetings were promptly reported by the newspapers, which meant there was an inward (internal) spy within the government.

Domain Awareness. The adequate knowledge of the enemy and his 'Heaven and Earth' i.e. season and terrain of operation is crucial for making tactical dispositions. He says,

"When in difficult country, do not encamp. In a country where high roads intersect, join hands with your allies. Do not linger in dangerously isolated positions. In hemmed-in positions, you must resort to stratagem." – Sun Tzu, Art of War (p.37)

"When envoys are sent with compliments in their mouths, it is a sign that the enemy wishes for a truce." – Sun Tzu, Art of War (p.48)

After achieving it's tactical/strategic objectives, the Chinese tried to appease Nehru to concede the Chinese territorial gains. When Nehru

rejected the same, China chose a ceasefire on 21 November 1962, before the advent of peak winters.[22] Continuing to hold ground in a 'dangerously isolated position' in a '*difficult country (adversary's)*' could have rendered Chinese troops vulnerable to attack (similar to German forces in the battle of Stalingrad in WW II). Thus, to avoid the likelihood of a '*hemmed-in*' situation while holding the gains on the ground, China resorted to stratagem and ordered a unilateral cease-fire.

Conclusion

India may not want to counter China but would wish to manage Chinese assertiveness. This will help India engage more meaningfully with China. To achieve this, in-depth knowledge of China's psyche developed over generations of cultural conditioning is critical.

Knowledge of Sun Tzu's Art of War and other such prominent eastern philosophies could be effectively utilised for understanding Chinese decision-making patterns, especially in the military sector. Detailed back-testing can be performed on the concepts derived from the study of strategic culture, and the same should be extrapolated to predict China's behaviour in various disputes/conflicts in the future.

As Alastair Iain Johnston has said, "How we think today is unconsciously influenced by the cultural conditioning over generations." Thus, tactically our adversary might produce advanced weapons, but strategically, his philosophical way of thinking will determine whether and how he might employ them.

One might argue that our adversary knows that we are studying his guiding philosophies and doctrines and may not follow them. However, that too is part of his deceptive nature, which can be understood from his philosophies. On similar lines, India needs to study its warfare and statecraft philosophies (such as Kautilya's *Arthashastra*). First, to better understand our cultural conditioning and secondly, to baulk at enemy plans, who are certainly studying them with similar motives.

What is more important than knowing what the enemy is up to or trying to counter (tactical), is to predict what the enemy might do in the future (operational), which will require deciphering how he thinks (strategic). This strategic objective can only be achieved by exploiting the pattern of the enemy's thinking, which is his strategic culture and the source code of his strategic culture are the guiding philosophies such as Sun Tzu's Art of War.

As Sun Tzu said,

"Know Yourself, Know Your Enemy, A Hundred Battles, A Hundred Victories." – Sun Tzu, Art of War (p.18)

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WHY THE NEED FOR THEATRE COMMANDS MUST BE DEBATED

Captain RS Sawan

Name a new play, and he's the poet's friend,
Nay show'd his faults-but when would poets mend?
No place so sacred from such fops is barr'd,
Nor is Paul's church more safe than Paul's churchyard:
Nay, fly to altars; there they'll talk you dead:
For fools rush in where angels fear to tread.

- Alexander Pope[1]

Introduction

In recent months the call for the theaterisation of Indian armed forces has gained traction. Indeed, discussions on the subject have moved from debating the need for theatre commands to a distinct sense of imminence.[2] Yet as the juggernaut of the most awaited military transformation begins to roll, there might be a case to pause and ponder, to reflect once again upon the 'whys' and 'wherefores' of theaterisation. For, once such a radical change as envisaged by the theatre command concept begins to take shape, it is nigh impossible to reverse its course. There are many voices in favour of theaterisation and some against it. The 'pros' views have been treated in detail in the main part of this paper. The opposing views follow two main themes. The first is that it may not be prudent to imitate the 'Western Model' and an organisation that is more suited to India's defence needs must be evolved. The second theme, which emerges largely from proponents of airpower, is based on how theaterisation is antithetical to the 'unity of airpower.'[3]

This article presents some arguments which seek a review - not of the need for change but of the shape of change that is desired to improve military efficacy and fighting efficiency of the armed forces. There is no doubt that greater jointness, synergy and, perhaps, integration, would yield optimum results in most future military operations. This article also does not contest the premise that to be more effective, India's armed forces should be prepared to embrace changes in their operational, training and

maintenance philosophy, which would lead them towards greater jointness. What this article aims to do, however, is to de-hyphenate 'jointness' from 'theaterisation,' because quite often the two are conflated in military discourse.

The theme of this article - that theaterisation in the Indian context must be carefully contemplated - is based on five core issues. The first is the need to distinguish between 'unity of command' and 'unity of effort.' This article argues that the theatre command structure focuses more on the former instead of the latter and therefore, the idea of 'unity of effort' which is central to jointness is likely to be neglected. The second argument stems from the widely discussed geographical aspect where it is believed that presenting a single theatre *vis-à-vis* land borders and the sea area would probably enhance cohesiveness and facilitate focused military operations. That such a belief rests on a rather tenuous premise forms one of the core arguments of this paper.

Thirdly, it is reasoned that segregating the 'raise, train and sustain' functions from warfighting are likely to create a dichotomy and also adversely impact operational effectiveness. Fourthly, it will be endeavoured to show that many of the 'ills' that beset the armed forces lie not in the existing organisation of military commands but elsewhere in areas such as civil-military chasm, indigenous defence industry, capital procurements, capability for absorbing technology and human resource management. Finally, this article will analyse the extant 'successful' theatre command structures in other armed forces to evaluate whether such structures are implementable *in toto* in India's context and if not, what could be the possible modifications that might need to be incorporated.

Need for Theaterisation

The call for theaterisation perhaps gained traction sometime at the beginning of this century, when immediately after the Kargil Conflict, the government had commissioned studies to reform the national security apparatus. This also included, *inter alia*, reforms in defence management.[4] The key focus of these studies lay in problems about jointness, civil-military relations, defence acquisitions, Defence Research and Development, budgeting and financial powers of Service Headquarters (SHQs). One of the many recommendations of the post-Kargil study was to introduce the office of the Chief of Defence Staff (CDS), a post which was

expected to render single-point military advice, prioritise inter/intra-service acquisition projects, administer strategic forces and ensure required 'jointness' among the three Services.[5] This recommendation was implemented in 2019-20.

Post-Kargil, many military experts continued to seek full implementation of the Kargil Review Committee recommendations and extend the concept of CDS, seeking 'integration' of armed forces through the establishment of theatre commands.[6] This idea of theatre commands in India was modelled after the US armed forces in the initial stages, which eventually evolved into a more 'Indianised' model as typified by a recent document published by the Takshashila Institution, among others.[7] The justification presented for the need for Theatre Commands is covered in succeeding paragraphs.

One Threat - One Theatre or One Threat - One Theatre - One Strategy

One Threat - One Theatre

The primary argument cited in support of theaterisation is that there must be 'One Threat - One Theatre,' which is sometimes manifested as 'One Threat - One Theatre - One Strategy.' This catchy phrase is based on the premise that there should be a single commander responsible to deal with a single threat. India has nine commands facing Pakistan and six commands responsible for the border with China.[8] This has been cited to highlight the presumed lack of synergy for the simple reason that there is a multitude of Commanders responsible to address a single threat. The argument, therefore, boils down to 'unity of command,' implying that Operational Commanders of all three services must act under the directions of a single Commander. This will, possibly, bring synergy in the application of force. In India's context, there is no such single Commander and the chain of command of each service runs independently right up to the SHQs. There are, of course, joint structures at the Brigade, Corps, Command and Service Headquarters which facilitate intra-service coordination.

This existing arrangement is also often contrasted with China's Western Theatre Command (WTC), which is singularly responsible for its border with India. Therefore, *prima facie*, the case for theaterisation sounds quite logical. The problem, however, is that it confuses organisational simplicity with efficiency. The Army (as also the Navy and the Air Force) is sub-divided into operational commands for faster response, decision-making

and mobility. These sub-divisions should not be construed as impediments in operational efficiency because organising fighting forces into self-contained, smaller units enhances fighting efficiency in comparison with unwieldy, monolithic forces or organisations such as a single operational command spanning the entire Northern border.

It will be useful to explore the rationale behind having several geographical commands facing a single frontier such as that between India and China. It is not hard to imagine the tribulations of a 'Theatre Commander' who is responsible for the defence of a 3,500 km long boundary that has stark variations in terrain and climate. How soon could the report of slightest border intrusion travel up the chain in such a vast theatre and how rapidly would the Theatre Commander's decision travel downward? How will the Theatre Commander, daily, personally monitor the situation in peacetime, and more so, in times of conflict? Essentially, and this is the core counter-argument, it is not the entire theatre that is pitted against the opposing theatre. Instead, it is the smaller units that fight in their allocated sectors or areas of responsibility. The more pertinent question, therefore, is of control and coordination of these units. This is addressed next.

Optimum resources will be employed in the area which is threatened

Even if the concept of 'One Threat - One Theatre' is accepted for the time being, how can a potential conflict against China (or Pakistan) be addressed by only one geographical theatre? Any large-scale military operation would necessarily involve naval forces as well as air assets from other 'theatres.' It is hard to imagine a scenario where a single Theatre Commander is left on his own to deal with external threats, while assets allocated to other 'theatres' remain unutilised. Surely, all available resources will be thrown in, especially when it is a matter of defending own territory. Therefore, theatre boundaries or assets under command of a particular Theatre Commander notwithstanding, optimum resources will have to be employed in the area which is threatened. It is perhaps because of this inherent contiguity in matters of national defence that former Air Chief, Air Chief Marshal BS Dhanoa had averred that "India is One Theatre."[9] In sum, the quintessence of the One Threat - One Theatre - One Strategy argument is assured support from other services, when required. As long as Services can assure immediate support to each other at the required time and place, the need for 'unity of command' becomes redundant.

Integration is more Cohesive and Synergetic

Closely related to the grandiose justification of the 'One Threat - One Theatre' stratagem is another simplistic argument that integration ensures better cohesion and synergy.[10] While it certainly is true that integration or jointness ensures greater cohesion, the same is not synonymous with theaterisation. A greater degree of cohesion is needed within each Service for which Service-specific procedures have painstakingly evolved over decades. For example, the Navy has an elaborate doctrinal framework, numerous policy documents, detailed Standard Operating Procedures (SOPs) and various orders in addition to a meticulously crafted human resources system and training infrastructure, which ensure coordination and cohesion within the various arms and branches in the Service. The case of the Army and the Air Force is also similar. The problem with theaterisation is that to integrate various components in a theatre, one would essentially be disintegrating intra-service cohesiveness. To elaborate, in the present set-up, each Service is 'integrated' as far as combat efficiency is concerned. The combat policy, tactics and doctrines are developed by each Service according to their need, forces are tasked according to the plan envisaged by SHQs, reinforcements are made available where required under the directions of SHQs while enablers such as intelligence, media campaign as well as coordination with other ministries are also carried out by SHQs - all under a unifying and integrating umbrella of how each Service sees itself fighting the battle. With theaterisation, the fighting components of each Service would be subsumed in a theatre construct, thereby destroying intra-Service cohesion to a large extent.

The second reason why an integrated theatre concept needs more thought is that it makes no distinction between 'unity of effort' and 'unity of command.' The former implies an 'effect,' wherein, disparate forces, which may be following separate chains of command, act together to address a common objective. This is akin to the 'Distributed Lethality' concept propounded by the US Navy some time ago.[11] An example could be an attack on a key enemy location from the sea and the air while land forces are in an assault. Unity of Command, on the other hand, seeks to deliver the same effect while necessarily having the relevant forces under the command of a single Operational Commander. The purported advantage of this system is that the concerned forces can be ordered to act as and when required by the Commander. But then so can the forces, which are not

directly under command, provided that swift and robust communications are ensured. There could, however, be a situation where the Air Force or naval platforms are not available or ready when the ground force commander needs them. Such situations can also be avoided through proper planning and ensuring real-time communication between forces.

Others Have Done It - Why Shouldn't We?

Another compelling argument for theaterisation emerges from the experience of the US armed forces where jointness brought about by the implementation of the Goldwater-Nichols Act is often brandished as 'proof' of the success of the Theatre Command concept. Similarly, the reorganisation of the People's Liberation Army (PLA) from seven military regions to five Theatre Commands is also used to highlight the impending 'danger' if the Indian armed forces fail to adopt a similar system. These arguments presuppose that organisational change alone can enhance military efficiency. Critical factors like the following are often ignored: -

- inequity in defence spending.[12]
- technological base and size of the military.[13]
- strategic context as well as the chain of command at the national level.[14]

Some of these differences have been elaborated upon by some authors to highlight key contextual differences between the USA, China and India as far as their respective military organisation is concerned.[15] One view against Theatre Commands is that the changes in the US military were brought about after a review of three operations conducted by the US forces: -

- Operation *Eagle Claw*.[16]
- Operation *Urgent Fury*.[17]
- The Marine barracks bombing in Beirut in 1983.[18]

However, no such critical review has been carried out for military operations undertaken by the Indian armed forces, implying an absence of empirical evidence in support of theaterisation. Nevertheless, it will be useful to see how jointness has fared in other militaries.

Experience in Other Armed Forces. Organisational change in some militaries did indeed result in success at the operational level. As brought out earlier, these changes were supported by commensurate fiscal, technological, political and geo-strategic factors. Further, many successes

that are quoted to demonstrate the effectiveness of Theatre Commands were perhaps so heavily influenced by an asymmetry in military and economic power that regardless of jointness, any consequence other than victory would have been hard to imagine. There are, however, some "unintended consequences" of jointness in advanced militaries.[19] These are discussed in the succeeding paragraphs.

UK Armed Forces. British policy has consistently emphasised a joint approach to operations and they have been rather adept at them. Yet, in an insightful piece on amphibious operations, Ian Speller proposes that "the most effective way to promote the development of joint capabilities is to link these explicitly to the self-interest of the key provider(s) [the Army, the Navy or the Air Force] and to build joint structures that encourage rather than inhibit this."[20] Studying the evolution of amphibious capabilities in the UK armed forces from the beginning of the Second World War, Speller contends that the British amphibious capabilities continued to atrophy after the war until the Admiralty adopted them under a broader context of Expeditionary Warfare. He quotes another example in Joint Force Harrier (JFH), wherein, the Harriers of the Royal Navy (RN) and the Royal Air Force (RAF) were merged into a new joint structure, which eventually led to the retirement of Sea Harriers because of the RAF's "preference for land-based, fast jets over anything that operates from the sea."[21] This ultimately resulted in the scrapping of the RN's carrier air arm, which impacted operations during the Libyan War when the British government admitted that "it was spending far more than it had imagined, and that even one carrier could have done far better at a much lower cost."[22]

British amphibious capabilities atrophied until the Admiralty adopted Expeditionary Warfare

US Armed Forces. For many, integration in the US armed forces is the epitome of jointness. However, there are some divergent views emanating from within the US armed forces on the subject, especially on how Goldwater-Nichols has dented single-service interests. The expanded power of the Chairman Joint Chiefs of Staff (CJCS), for example, is debated on whether the quality of military advice (as rendered by the CJCS) is superior to that of the pre-Goldwater-Nichols era when all service chiefs had an equal say.[23] It is suggested that the CJCS would invariably be coloured by his service perspective and may be unable to see a balanced picture.[24] Some believe that appointing the Chairman as the Principal

Military Adviser has "limited…..the scope of military advice available to the political leadership."[25] It has also been suggested that Combatant Commanders often compete with Service Chiefs, even in bureaucratic, non-warfighting service functions.[26] Another author notes that the Services are becoming "less joint," referring to the predominantly ground-based wars in Iraq and Afghanistan that have widened the chasm, particularly between the Army and the Air Force.[27] This may have lessons in India's context where the Army has similarly been the pre-dominant player in majority of the past conflicts.

In operations, the Service bias of Theatre Commanders is likely to be more pronounced. For example, in Operation *Desert Shield/ Storm*, General Colin Powell (CJSC), Gen Schwarzkopf (CINCCENT) and Lt Gen Thomas Kelly, Director of Operations (J-3) in Joint Staff "primarily called for using land forces and assigned only a minor supporting role to airpower," "did not think airpower would have a significant strategic impact" and as army generals "had only considered land-centric alternatives."[28] Similarly, in Operation *Just Cause*, "Powell favoured an Army-oriented plan by stifling disagreement and failing to consider alternatives that reduced risks."[29] Therefore, there is a danger in unification when "under cover of jointness, [the US forces] are moving toward a one-service type military."[30] Another pitfall of unification in the US has been the re-emergence of 'careerism' wherein officers jockey for assignments to Joint Staffs and as Staff in Unified Commands to enhance their promotion prospects.[31]

All PLA Theatre Commands have responsibility for geography based contingencies

People's Liberation Army (PLA). Post reform, each Theatre Command in the PLA has responsibility for specific contingencies based on geography. However, this organisation is not yet perfect, as one expert postulates that in the event of a conflict with India, the WTC has no naval component to address the naval conflict. In this scenario, the responsibility for naval operations would perhaps be given to PLAN HQ, thus challenging the principle of unity of command and raising the issue of how the PLA would coordinate land and naval operations in different theatres.[32] It has also been suggested that in practice, the PLA Service headquarters have held onto some operational command responsibilities, including some relevant to overseas operations.[33]

Theatre is the 'Modern' Way to Fight[34]

Proponents of Theatre Commands have also called the existing organisation in India 'outdated.'[35] They have drawn attention to the fact that most advanced militaries have since long abandoned their old organisation in favour of a more agile and responsive one. The Theatre/ Joint/ Unified/ Combatant Command concept in modern warfare emerged during the Second World War in the European Theatre.[36] In the era preceding airpower, however, several successful expeditions combining the land and sea forces were led by kings and generals in India and abroad.[37] Therefore, as a concept, a Unified Command of armed forces is hardly modern.

What might be referred to as 'modern,' is the US model. It is common knowledge that the Goldwater-Nichols Act of 1986 cemented the joint structures in the US armed forces. What is less commonly known is the laborious journey of this process that began with the National Security Act of 1947 which slowly worked through four revisions in 1949, 1953 and 1958. It might be unsurprising then that the enactment of Goldwater-Nichols legislation itself took almost five years.[38] The point that must be emphasised here is that the theatre concept is hardly 'modern' by any standard. Instead, the concept is based on the necessity that emerges from the need to position forces under a single commander in cases where the battle is conducted far from its territory, or in other words, *expeditionary operations*. In such cases, it is neither feasible to assign forces to the on-location commander at immediate notice nor orchestrate the battle from the homeland due to a lack of communication and real-time situational awareness. Therefore, the Theatre Commander is entrusted with the command of all forces participating in that operation so that he can act independently in pursuit of the assigned mission. In the case of territorial defence, the problems of communication and swift assignment and re-assignment of forces do not exist and therefore, the need for theaterisation does not arise.

Theaterisation Promotes Jointness and Optimises Resources

It has been argued that theaterisation will eliminate parochialism, 'turf-wars' and 'inter-service rivalry' because everyone will be joint. No other argument could be more misplaced. To be sure, competition among Services is a good thing because it promotes innovation and preserves the core competencies of each Service. Inter-service rivalry arises due to the

competition for resources, which will always be limited. This is a ubiquitous phenomenon. In the USA, for example, rivalry for resources now occurs primarily among Combatant Commanders.[39] Further, inter-service politics in the USA pervades even the selection of Combatant Commanders.[40] In India's context, intra-service parochialism itself is so deep-rooted that it is difficult to see how this will not impact *inter-service relations* if the armed forces were to become 'truly joint.'[41] A first step, to begin with, would perhaps be to smoothen the ruffles within each Service.

One might also be tempted to conclude that theaterisation will result in greater synergy in operations, training and acquisitions simply because the three Services are working together. It does, but only to the extent that Services are willing to be joint. This is so because experience indicates otherwise. In Operation *Desert Storm*, for example, US Navy aircraft could not freely operate with other joint assets within the framework of an Air Tasking Order (ATO) even though this deficiency was subsequently eliminated in Operation *Iraqi Freedom*.[42] As far as training is concerned, a survey conducted in the US War College classes of 1998 indicated that parochialism does exist among future leaders. It also suggested that joint education and experience may not reduce Service bias.[43] Acquisitions in the US armed forces have perhaps been the worst affected by jointness. Seemingly, the Joint Capabilities Integration and Development System (JCIDS), the process the Joint Staff uses to develop warfighting requirements, turned out to be both 'cumbersome' and 'unresponsive.'[44]

Optimisation of Resources. A common refrain supporting the call for jointness is that India has 17 different commands across the three services and not any two of them are co-located. But this hardly makes the case for theaterisation; at best one could ask for co-location of commands if that is the point of contention. It has also been suggested that structural integration of the current service-specific commands will lead to optimisation (read cuts) in manpower, and, eventually free up the budget for capital expenditure.[45] Although this argument appears logical, evidence indicates otherwise; the manpower, as well as revenue expenditure, increases due to joint staffing needs.[46] A January 2015 report by a federal advisory panel in the USA found that the Pentagon could save US $125 billion in administrative waste by streamlining its bloated bureaucracy.[47] Although the idea of pooling resources together to optimise costs seems attractive, it does not work in practice. This is simply because the need for resources and

services is directly proportional to the size of combat forces and unless the combat forces are reduced, the costs will not. On the contrary, by creating Theatre Commands which will not need to depend on external support, the Services will be replicating the existing infrastructure in each of these commands.

The Naysayers' Plea

Having described the key arguments demanding the theaterisation of Indian armed forces, it is apt to explore contrarian views and their underlying rationale. Admittedly, one needs to look harder for these opinions since they are few and far between, often overwhelmed by the massive rhetoric that runs against them. This, of course, by no means implies that the contrarian view stands on tenuous ground. Indeed, if at all, scholarly thought must evaluate issues based on rationality instead of giving in to brute majoritarian views. The counter to theaterisation is based on three main arguments: -

- Need (lessness) of theaterisation in India's context.
- Advantages of command and control by Services while maintaining unity of effort in operations.
- Preserving core competencies of each Service.

Theaterisation in India's Context. The need for theaterisation in expeditionary operations has been elucidated earlier in this article. What must be emphasised here is that within the limits of 'defence-based missions,' that is, where primacy is the preservation of territorial integrity against external aggression, the theatre concept is what Air Chief Marshal S Krishnaswamy (Retd) calls an "unnecessary idea."[48] This is because against any external aggression, the limited resources of one Theatre Commander will not be sufficient. Instead, the entire armed forces will be mobilised depending upon the place and manner in which aggression happens. The movement of assets will need to be coordinated across the country and reinforcements will need to be provided where required. All this can easily be controlled and coordinated by SHQs. As far as the orchestration of battle is concerned, this will be done best at the level of the Chiefs of Staff Committee. Thus, emerges the second argument in the succeeding paragraph.

Centralised Command and Control by the Services. Modern long-range vectors, improved communications and enhanced battlespace transparency

enable centralised control of forces at the operational level. The inherent flexibility of modern combat platforms, especially naval and air assets and even long-range artillery, dictates that their employment be controlled centrally instead of assigning them permanently to theatres. Of course, for administrative reasons, these assets would have to be based at some peacetime location but their wartime employment must be controlled centrally. This means that these assets must be deployed or assigned to the theatre (or area of operation) that needs them and then re-deployed to another area when the need arises. It would simply be wasteful to tie down these assets permanently in a theatre.

Problems with the 'Raise, Train and Sustain' Model. One of the common extensions of the theatre command concept is that while the operational control of combat forces will lie with the Theatre Commander, the 'raise, train and sustain' functions will be carried out by Service Headquarters.[49] This proposition raises crucial questions such as on what basis will resources be allocated to theatres? At a time when Services are struggling for resources, it is unclear how frontline combat units can be distributed in 'penny packets' even as the IAF is striving to build up its sanctioned 42 squadrons strength.[50] The other issue is accountability and responsibility. In the present set-up, the Services are acutely aware of capability shortfalls and therefore focus their effort and resources on making up the deficiency in the shortest time possible through re-allocation and re-basing of assets in the short term and expediting acquisitions in the long term.

The bigger problem, however, is that all Theatre Commanders will seek the best possible equipment and manpower without themselves having a real stake in the long-term functions of 'raising, training and sustenance.' Therefore, their perspective will invariably be limited to the short-term duration of their tenures, a problem that has equally been faced by the US armed forces.[51]

Perhaps the most significant impact would be due to human resource management, a practice that is vastly different in the three Services. Recruitment, training, transfers, welfare, discipline, accommodation, terms and conditions of service, promotions and suitability of employment in specific billets are all managed differently among the three Services. Before the armed forces transition to theaterisation at the operational level, the administration, HR and most importantly, service culture, would need to be

harmonised lest they should adversely affect morale.

Preserving Core Competencies of Services. Many American authors, recalling impact of the Goldwater-Nichols Act on the US armed forces, have written how this legislation also served to blunt the core competencies of individual Services. One author, for example, calls attention to the dangers of 'Strategic Monism' - a term that refers to primary reliance on a single concept, weapon, Service or region because power "has shifted from the Services to Joint Staff."[52] Another quotes a former Commandant of the US Marine Corps, "In our effort to standardize how we treat Service members across the Department of Defense, our laws increasingly limit the flexibility required to maintain Service competencies and cultures."[53] Noting that the Services are where warfighting capability lies, he calls for restoring the authority of Service chiefs in the US armed forces.[54] Steven Wills writes that in the wake of Goldwater-Nichols, opinions of Senior naval leadership on naval strategy and force structure were rejected in favour of those of an army general. Consequently, the Navy's inability to exert influence on its size, composition and missions reduced its strategic concepts to a regional rather than global character.[55] It is another matter that because the US defence spending is the highest in the world and it spends more than the next ten countries combined, the debilitating effects of 'forced jointness' are hardly visible. But, in India's context, the evidence against emulation, even if meagre, must be factored in decision-making at higher levels.

Laws limit flexibility required to maintain service competencies and cultures

The Real Ills

The final part of this article accentuates issues that are more critical to combat efficiency than the seductive idea of a transformational change through theaterisation. These issues are systemic and require a massive effort to address in contrast with the relatively 'low hanging fruit' of theaterisation. The inefficiencies of defence procurement are well known and have been highlighted by the CAG time and again in their several reports. As recently as in 2019, the CAG examined 11 contracts of capital acquisition signed between 2012-13 and 2017-18 and recommended structural reforms of the entire acquisition process.[56]

Civil-Military Relations is another area of concern about which many

experts, notably Admiral Arun Prakash (Retd) have written extensively.[57] It is one thing to create Theatre Commands in India and quite another to replicate the Pentagon in New Delhi. The indigenous defence industry, Defence R&D, Science, Technology, Engineering and Mathematics (STEM) base, legacy defence equipment, long overdue modernisation in the face of perennial budgetary constraints, HR management in armed forces, internal security situation that takes up a massive chunk of defence resources are some other issues that need to be examined. It is opined that addressing these crucial issues would perhaps have a more profound effect on defence preparedness and fighting efficiency than would mere organisational change.

First identify own needs and then adopt a suitable model of jointness

Conclusion

This article made three key arguments. First, 'theaterisation' is not synonymous with 'Jointness.' The former only seeks to unify, sometimes unnecessarily, diverse elements of military power without much regard for the specialised capabilities of each such element. The second argument highlighted the many pitfalls of theaterisation. Among them, the key is the risk of blunting core competencies of Service elements at the cost of one dominant Services' perspective. The third argument is about context. In India's context of a focus on territorial defence and eschewal of expeditionary ambitions, the need for theaterisation does not appear justified. More importantly, there is a need to look at critical deficiencies in areas such as defence procurement and civil-military relations to enhance defence preparedness.

Theaterisation is not bad. However, it must be understood as one of the means to improve synergy among the three Services and not necessarily the only means. There is a need to first identify own needs and then adopt a model of jointness that will be most suitable to do that. On the same note, inter-service rivalry is also not an evil to be shunned. The West has succeeded because it understands the value of pluralism: Rivalry between the Services can bring out the best in all. Stifling that rivalry does not necessarily bring efficiency.[58] The existing model of jointness and inter-service cooperation among India's armed forces has been tested in battle. Of course, there is a huge scope for improvement but theaterisation is not necessarily the answer.

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STRATEGIC POWER PLAY IN THE ARCTIC: IMPACT ON GLOBAL ECONOMIC AND DEFENCE STRUCTURES

Lieutenant Commander Shivtaj Singh Bal

Background

The Arctic has evinced the interest of explorers and statesmen since dawn of the modern age. A new route to East Asia through the North Pole has been the subject of recent deliberations. While global warming has brought several changes in the region, two of them have strategic implications for the wider world - relative ease of extraction of natural resources and practical utilisation of waterways in the Arctic. These two changes have increased geopolitical stakes in the region. The geographical proximity of Russia and the United States, and involvement of China in Arctic affairs have increased strategic competition in the region.[1] This competition primarily emanates from differing self-interests of these major powers towards the usage of Arctic waters and its resources.[2] Availability of Arctic waters in summer has started impacting the patterns of global shipping. At present, the tonnage of cargo moved through Arctic waterways is minuscule compared to tonnage carried on other routes. However, yearly upward growth coupled with further ice reduction in the region points to Arctic waterways becoming major competitors to other routes in future, especially Suez and Panama Canals. While becoming essential from an economic point of view, the International Sea Lanes (ISLs) have also become strategic tools in the inventory of states. The British policy of maintaining protectorates at Aden and Malacca was part of maintaining strategic control over ISLs. The struggle for nationalisation of the Suez Canal led to a brief war between Britain and Egypt. How, then the new routes emerging in the Arctic are going to be governed?

The increasing militarisation of the Arctic has increased volatility in the region.[3] It includes commissioning of new bases and re-activation of old bases by Russia and corresponding actions by NATO. Planting of the

Russian flag at the seabed of the North Pole; China's assertion of a 'Near Arctic State' to participate in the governance of the Arctic; efforts of the United States to reinvigorate its Arctic policy to push back advances of Russia and China; Canada's claim of sovereignty over Northwest passage; all these issues point to a crisis between states in the region. The annexation of Crimea in 2014 and the ongoing Special Military Operation in Ukraine by Russia have led to renewed geopolitical rivalry between Russia and Western Nations. Sanctions imposed by the West on Russia have, in turn, led to close strategic relations between Russia and China. A new paradigm has emerged since then, where Russia has been able to continue its business evading Western sanctions with help of friendly countries, primarily China. All these issues have significance, not only in the region but for states outside the Arctic also. Hence, this paper aims to holistically examine the consequences of militarisation in the Arctic and its resultant effects in the region concerning changing economic and defence structures.

Climate Change and Arctic

Climate change in the Arctic can be measured in various ways, the most preferred being a measurement of reduction of the ice cap on an annual basis.[4] NSIDC, Boulder, Colorado reported in 2018 that the extent of ice in winter was the second lowest since records began, beating the lowest record narrowly in 2017. The average temperature in the Arctic region was up by 7-8°C in the winter of 2017 - 2018.[5] Northernmost permanent settlement of Alert at a latitude of 82° 30' 06" N, in the Canadian territory of Nunavut experienced temperatures up to 21ºC in July 2019. While seasonal ice has been reducing, there has been an increasing concern for the reduction of multiyear ice (ice that remains for more than one year) which is thicker than seasonal ice.[6] It has now been argued that a point of "No Return" or "Arctic Death Spiral" has been reached where ice continues to diminish until it is sporadically or completely ice-free. While in other parts of the world, climate change is generally associated with scarcity of resources, in the Arctic climate change may well be a harbinger of an increase in the availability of natural resources. To complement the extraction of resources, the warming Arctic will also provide sea lanes for transportation.

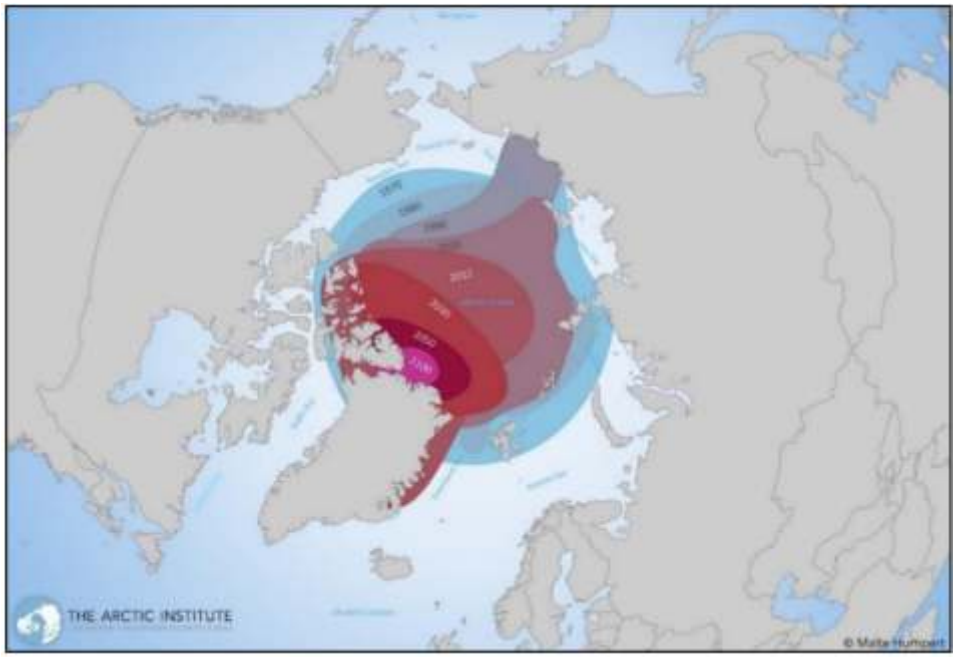

Fig 1: Projected Permafrost Till 2100
Source: The Arctic Institute (2022)

The Arctic regions which are likely to focus on increased exploitation of oil and gas include the Beaufort Sea, parts of the Russian Northwest (containing regions of West-Siberia and Barents Sea) and the Canadian Archipelago of Nunavat. By an estimate by the US Geological Survey, the Arctic region contains oil and natural gas to the tune of 90 billion barrels and 1670 trillion cubic feet respectively. These estimates further state that about 44 billion barrels of Natural Gas Liquids are stored North of the Arctic circle, shown in purple/blue areas in figure 2 below. Of these, almost 84% are expected to be discovered in offshore areas. With the melting of multiyear ice in the Arctic, extraction of oil and natural gas will become easier.[7] This is likely to intensify efforts by coastal states to claim even larger parts of the Arctic Ocean to benefit from future oil and gas boom in the region.

Russian Federation holds the largest deposits of minerals in the Arctic region. Russian Arctic regions with abundant mineral resources are the Kola Peninsula, the Arkhangelsk Oblast and the Murmansk Oblast which has proven reserves of Phosphorous ores, Iron ore, Titanium, Bauxite,

Diamond deposits and rare earth metals. The state of Alaska in the United States holds vast Zinc, Lead, Gold and Silver deposits. The Canadian area of Nunavat in the Arctic Circle contains considerable deposits of Diamonds, Gold, Iron ore and rare earth elements. The Norwegian territory of Svalbard contains minerals of industrial value such as Olivine. As in the case of oil and gas exploration, a warming Arctic region is likely to provide a more conducive environment for the yearlong mining of these minerals. Additionally, the availability of sea lanes for a longer period of an year will aid in the shipment of these resources easily and economically via sea rather than over land.

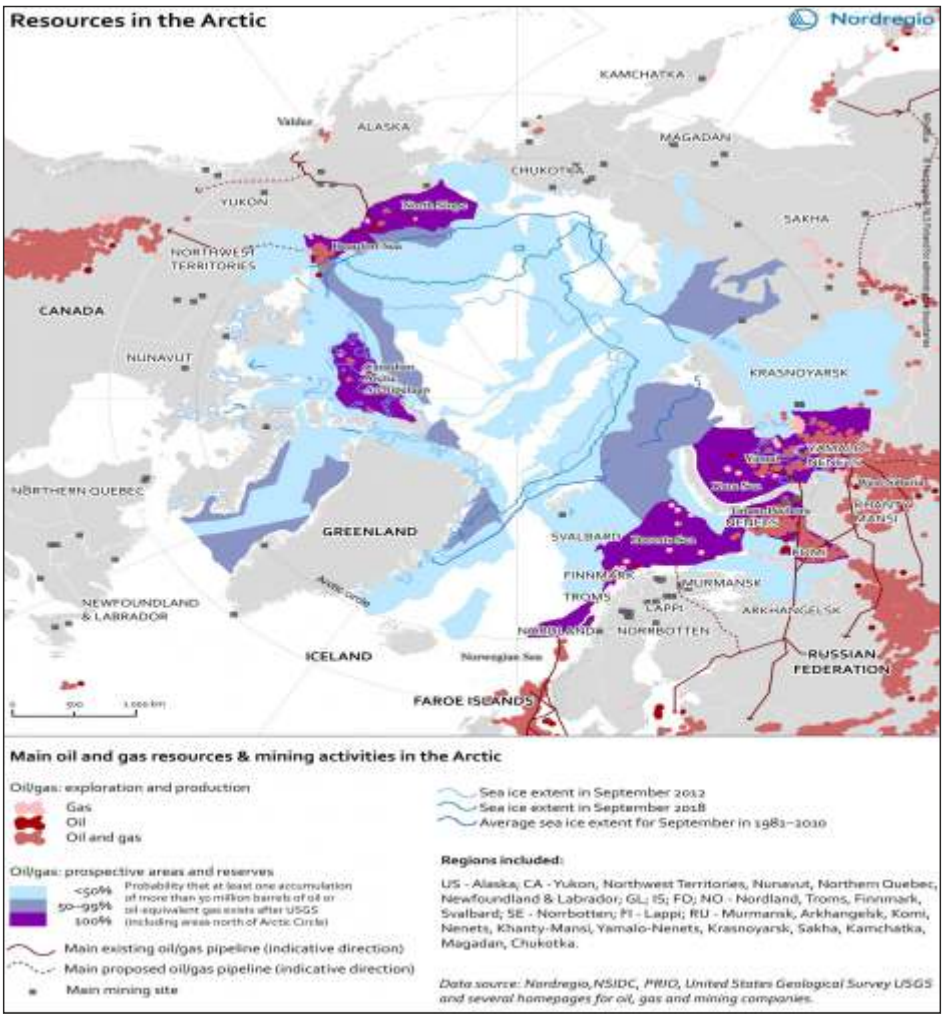

Fig 2: Natural Resources in Arctic
Source: Nordregio (2019)

International Sea Lanes (ISL) in the Arctic

Shipping routes in the Arctic have been predominantly focused on two coastal sides of the Arctic, one on the Russian and Nordic coasts and the other on the Canadian coast. These are respectively known as Northeast Passage (NEP) and Northwest Passage (NWP). The third route which cuts across the North Pole is called Transpolar Sea Route (TSR). This route is yet to be used for commercial shipping given the permanent ice over the North Pole.

Fig 3: Distance advantage of the NSR (NEP) over the Suez route.
Source: Bekkers et al., 2015.

Northeast Passage

Northeast Passage (NEP) extends from the Barents Sea to Bering Strait. The economic potential of NEP is divided into two categories: transit shipping and destination shipping. Transit shipping involves the usage of NEP for transportation between non-Arctic ports such as from NE Asia to Northern Europe. Destination shipping refers to the transportation of goods/ people between ports where either origin or destination is in ports of NEP. NEP has the potential to reduce the route from East Asia to Europe (e.g. from Shanghai to Rotterdam) by 24% (w.r.t via the Suez canal) if the presence of ice is negated. The economic advantages of trade through NEP are more for countries of Northeast Asia e.g. China, Japan and Korea. As per Table 1 below, between 2016–2019, 8329 voyages were undertaken on the NEP. Ships plying NEP have climbed by 58% from 1705 to 2694 (2016 - 19). A quadruple increase in the cargo volume of NEP was recorded, which

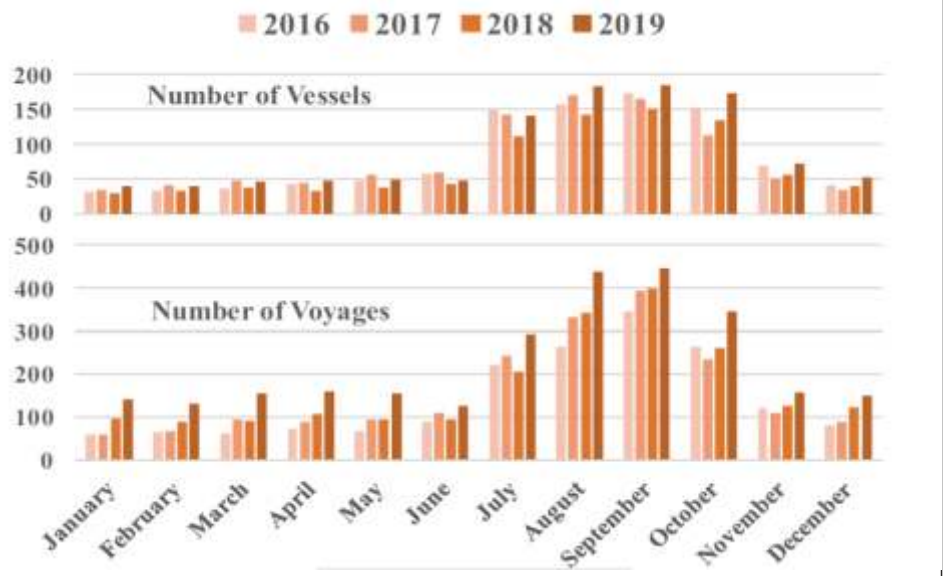

Table 1: Traffic on NEP 2016 - 2019
Source: The Arctic Institute (2022)

went up from 7.5 million to 31.5 million tons in the period from 2016 to 2019. NEP had 1232 destination voyages between 2016 and 2019.[8] This included 1108 voyages between European and NEP ports and 124 between Asian and NEP ports. On the other hand, a total of 51 transit voyages were

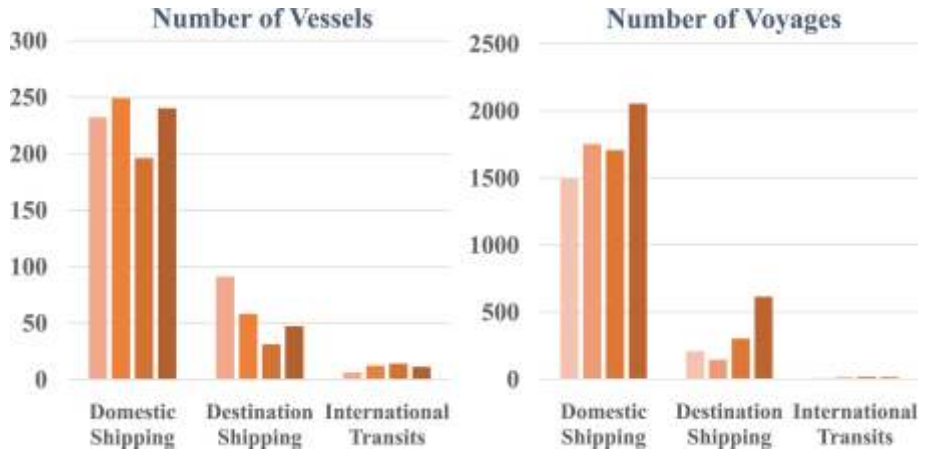

Table 2: Share of Domestic Shipping, Destination Shipping and International Transit Shipping on NEP 2016 - 2019
Source: The Arctic Institute (2022)

made from 2016 to 2019. Out of these 47 carried cargo of 980,700 tonnes (Table 2). The port of origin for most of the cargo was Asia with 28 journeys, or 60% and was mostly from China (19 voyages). COSCO Shipping Specialized Carriers, a Chinese shipping company led the way with 23 journeys, accounting for 45% of all foreign transits over four years, followed by German companies with 25% transits.[9] In 2019, COSCO also undertook voyages from western Russian ports to China and Vietnam. While domestic shipping remains one of the largest contributors of mercantile traffic on NEP, there has been a steady increase in destination traffic, both to and from Russian ports and international transit traffic, mainly between NE Asia and Western Europe.[10]

Northwest Passages

Multiple marine passages which connect the Pacific and Atlantic Oceans in the Canadian archipelago are collectively known as North West Passages (Fig 3). It goes along North America's northern coast and through Canada's Arctic region. Over the last 25 years, total yearly distance (km) travelled by all vessel types in Arctic Canada has trebled. As per Table 3, the period between 2011 and 2015 showed sustained growth and development, with traffic increasing even more to an average of 862,881 km, a 90% increase over the baseline period of 1990 to 1995. Over the last five years of record, total kilometres travelled have consistently been the highest in a

quarter-century.

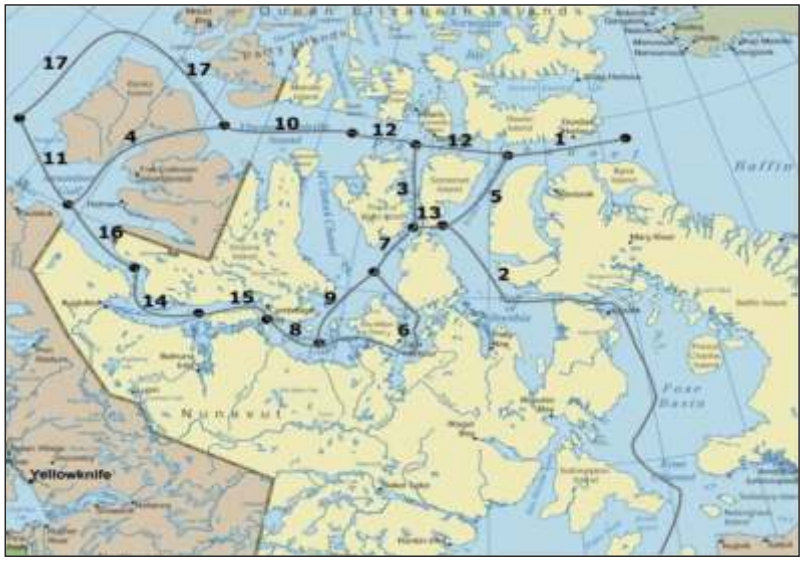

Fig 3: Representation of Northwest Passage in the Canadian Arctic
Source: The Arctic Council (2019)

Before 2015, bulk carriers made two transits through Northwest Passage (southern route): in 2013 (Nordic Orion) and 2014 (MV Nunavik). By the end of 2019 navigation season, 313 full transits of Northwest Passage had been conducted, raising the possibility of using Northwest Passage as a continuous route between the Pacific and Atlantic Oceans. Even though vessel traffic is currently minimal, it is progressively growing.

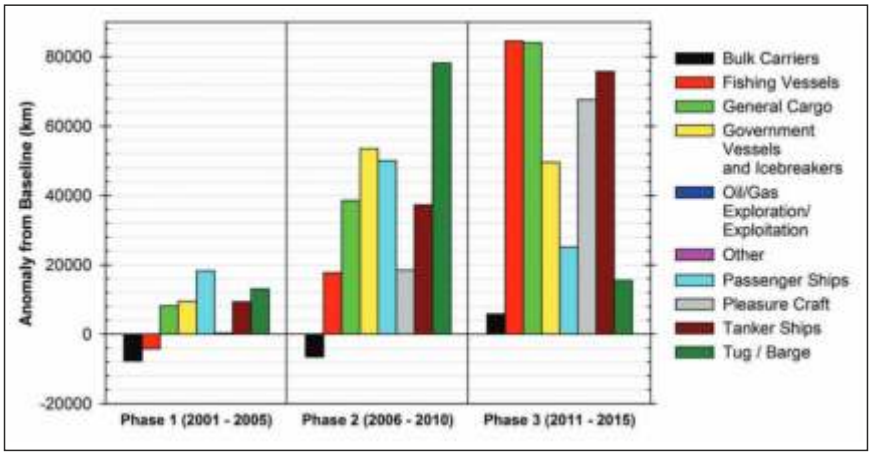

Table 3: Change in Annual Average Kilometres Travelled Per Year
Source: The Arctic Council (2019)

Distance sailed by bulk tankers in the Arctic Polar Code area increased by 160 per cent between 2013 and 2019. The Canadian Mary River Mine, which opened in 2014, contributed to this significant surge in Northwest Passage's eastern end. As seen earlier, due to their impact on trade, bulk carrier transits over Northwest Passage have grown considerably from 2013 to 2019.

Arctic Policies of Major Powers

This changing nature of the ocean and space around it has led various countries around the Arctic circle to take action proactively in publishing their intentions for providing strategic communication and policy guidelines to internal audiences and as part of enforcing their intentions. It is important to examine their national policies to gauge major divergent issues in their national policies.

Arctic countries have provided strategic communication and policy guidelines

The USA in its Defence policy on the Arctic has refused to accept claims of Russia (and Canada) to govern waterways adjacent to their coasts as internal waterways under their national jurisdiction.[11] It is important to note that foreign-flagged vessels do not enjoy the rights of freedom of navigation in internal waterways as per UNCLOS. While the USA and Canada are likely to build some understanding of North West Passage, the same cannot be said about the Russian perspective on NEP.[12] Russia claims NEP as an internal waterway under its jurisdiction and has re-activated naval bases in the region to demonstrate an intent to protect these claims.[13] China, which has emerged as a major partner of Russia in the recent past, has pursued a policy of governing waterways as per UNCLOS. This supports the United States' position. However, if China supports the Russian position on this issue, then China will be required to take permission for Chinese-flagged vessels to transit NEP. This will not be a position which China would want if ties between neighbours sour in the future.

Of all the non-arctic states involved in the region, China is most vocal about the rights of non-Arctic states to participate in resource exploitation as well as governance of the Arctic. China has claimed itself to be a 'Near Arctic State,' a claim which has been outrightly rejected by the United States.[14] Reasons for China to assert its claims are clear: to create favourable

conditions for Chinese enterprises to carry out economic activities.[15] While the United States has outrightly rejected its claims, other allies and partners of the USA have been less vocal about this.[16] Russia seems to embrace its status as Near Arctic State to enhance its partnership and peruse technology offered by Chinese enterprises, especially in oil and gas exploration.[17] Chinese insistence and American rejection of Near Arctic state status is therefore another flashpoint in the Arctic.

Both Russia and the United States have identified the thawing of Arctic ice as a potential opening for the deployment of forces by adversaries in the region. Russia states that this new reality will expand its borders, which need to be protected while the USA has stated that the Arctic can be used by potential adversaries to manoeuvre their forces to attack the US homeland.[18] This divergent understanding of nature has therefore increased military deployment to defend their perceived national security interests.

Divergent understanding of nature has increased military deployment to defend national security

Impact on Global Economic and Defence Structures

China has increased its activities immensely in the Arctic during the last decade. China signed the Treaty of Svalbard in 1925, which stipulated access for non-Arctic countries to the region. China has used this treaty and UNCLOS as a legal basis for its activities in the region.[19] The most impactful decision for the engagement of China in the Arctic was the announcement of the "Polar Silk Road" as part of the Belt and Road Initiative.[20] As NEP provides the most beneficial alternative to China, Chinese companies have begun to invest heavily to upgrade infrastructure in various ports along the NEP.

Chinese state company COSCO undertook its first transit voyage in 2013 rising to 36 transit voyages by 2019. A joint venture named Maritime Arctic Transport (MArT) between two Chinese enterprises, COSCO and Silk Road Fund and two Russian enterprises, Novatek and Sovcomflot was unveiled to facilitate a smooth outflow of energy shipments from the Russian Arctic to East Asian states.[21] China has increased investment in the extraction of hydrocarbons as well as mineral resources not only in Russia but also in other Arctic states as well. Some of the major investments are in the Yamal peninsula (exploration of LNG), Greenland (Isua iron ore mine)

and Canada (Nunavik nickel mine and LNG project in Northern British Columbia). Decreasing permafrost has provided China with an opportunity to invest its capital in the infrastructure and technology sectors in addition to using its waterways for resource exploitation and transit shipping to North European shores.

Another area where China is fast catching up with Japan and North Korea is building ICE-class shipping vessels capable of transiting Arctic shipping lanes. A Chinese shipyard won a contract for building seven ICE class ships for Danish company Maersk. LNG condensate ships for the Yamal LNG project are also being built by Chinese shipyards. The Yamal LNG project is one of the prime examples of Chinese interests in the Arctic. China actively participated in gas exploration, funded the project partially (20%), and uses Arctic waterways to transport LNG to Chinese ports in Chinese-built LNG condensate ships. PLAN deployed its warships for friendly port visits to Nordic countries for the first time in 2015. In 2021, Chinese warships were detected near the Aleutian Islands off the coast of Alaska where the US Coast Guard shadowed these ships. China has many times emphasised freedom of navigation in the Arctic as an inalienable right of non-Arctic states because Chinese economic progress hinges on it in future.

Militarisation, in the context of Russia, means increasing military drills, increasing the number of military bases, enhancing surveillance by increasing radar stations, enhancing reach by constructing new icebreakers etc. This has led some commentators to comment that Russia has opened an "Arctic Front in a New Cold War." The latest foreign policy of Russia, adopted in 2015, is based on the idea of the re-emergence of the Russian Federation as "a key player in international politics." The foreign policy proclaims that Russia will "be firm in countering any attempts to introduce elements of political or military confrontation in the Arctic."[22] Russia has also undertaken some dual-use measures such as modernising its icebreaker fleet, enhancing regional connectivity infrastructure including ports and airports, and upgrading communication facilities, which serve both military and civilian purposes.[23] 2007 marked the commencement of strategic bomber and Northern Fleet patrols in addition to the planting of the Russian flag at the North Pole seabed. These patrols were last undertaken during the Cold War era. SSBNs based in the Northern Fleet are part of Russian sea-based nuclear deterrence, which makes the fleet an important part of the

Russian military. Russian submarines have been increasing their operational radius by foraying further away from their bases and also increasing below-ice training. About 100 new military facilities have been operationalised since 2017 in six new bases built to accommodate aircraft, ships and ground forces. In addition to aerial and naval activities in the Arctic, Russian ground forces have been increasingly deployed in the region to learn "Arctic Warfare" techniques. In wake of the Ukraine crisis, the USA and other NATO countries have reaffirmed their commitment to countering Russian aggression worldwide, especially in the Arctic.

Norway, which is the most significant NATO ally in the Arctic, vide its Core Area plan of 2008, attempted to increase NATO's commitment to collective security to High North.[24] An increase in military exercises, coupled with the inauguration of a Joint Force Command for the defence of North Atlantic and European High North in Norfolk, Virginia has provided a sufficient impetus to NATO's response to Arctic Militarisation by Russia. The USA has increased its military activity significantly in the Arctic region since 2016. This includes stationing an increased number of troops in Norway and Iceland, reactivating the 2nd Fleet, increasing the scope of defence ties with yet-to-be NATO members Sweden and Finland, and increasing diplomatic engagements in support of Iceland and Greenland.[25]

Camille Grand, NATO's assistant secretary general for defence investment, stated in 2017 that the working assumption ten years ago was that [the High North] was more of an area shielded from strategic competition and risks, whereas today we see more of a great game of power. Furthering this narrative, in June 2020, NATO Secretary General Jens Stoltenberg during the launch of the NATO 2030 agenda, reinforced the importance of the Arctic for alliance members. Post annexation of Crimea by Russia in 2014, military cooperation between Russia and NATO members collapsed completely. The conference of "The Arctic Chiefs of Defence" was cancelled followed by the expulsion of Russia from the Arctic Security Forces Roundtable.[26]

Another threat on the horizon for NATO, is the expectation that the alliance will have to resist the increasing influence of China in the region. This can be ascertained from the fact that while unveiling strategies for NATO 2030, Mr Jens Stoltenberg, emphasised the threat to Arctic states from China rather than Russia in long term. Despite the present state where Chinese influence is rather limited and faces various hurdles in future, the

USA and NATO consider that strong action is needed now to stem any potential growth of Chinese ambitions and influence. 'Future Operating Environment' remains uncertain in the Arctic as was apparent during a conference held under the aegis of NATO in September 2019 to discuss tactics in the High North. However, there was a consensus that the reduction of ice will inevitably change the nature of operations in the Arctic, especially for surface warships. Naval ships were restricted to a very small portion of the Arctic during the Cold War specifically near the Barents Sea. However, in the present circumstances of reducing ice coverage, the possibility of naval ships traversing the entire NEP and NWP cannot be ruled out. Hence, freedom of navigation operations by NATO and the insistence of Russia for all vessels to take permission before undertaking passage through NEP will be in direct conflict with each other.

NATO members participated in the 2018 Exercise *Trident Juncture*, which simulated the capability to reinforce Norway in the event of a military conflict.[27] Formation of Joint Forces Command to improve readiness throughout the combined area of the Arctic and North Atlantic represents a substantial change to NATO's position. With decreasing ice, access to wider areas in the Arctic will result in NATO alliance members and Russia operating around each other in the Arctic and across the region. For NATO, 'losing' access to the Arctic would have far-reaching consequences, notably in terms of the organization's North Atlantic and Baltic stance. The Arctic has even more strategic relevance for NATO now than it had during the Cold War.

Conclusion

Scientists have projected that the Arctic will experience ice-free summers earliest by mid-century and latest by end of the century. The Arctic region, especially offshore regions, have vast unexplored areas of natural gas and petroleum. The region is also rich in rare earth metals, iron ore, titanium as well as gold and diamonds. The diminishing ice has led to emergence of new maritime routes to ship these resources outside the region. The three Arctic routes will act as competitors to other major sea lanes of commerce in vogue. Major shipping companies in the world viz. Maersk, COSCO, etc. have shown interest in these routes for efficient delivery of cargo. This includes not only cargo from the Arctic but also transit voyages to advantageously use the shorter distance between Europe

and East Asia as well as between the Atlantic and Pacific Oceans. With these developments, strategic power play in the Arctic has intensified.

China's involvement is believed by some as having a positive impact as an usher of new investment and technology in the region while others believe it to be a part of the grand strategy of China as a strategic competitor to the USA. While China has not deployed its naval assets to the Arctic yet, the future looks uncertain in this aspect. As the old saying goes, "Flag follows trade," China may willingly or be forced to use its naval might to protect its expanding economic interests in the region. Russia, on the other hand, has continued to militarise the Arctic. This militarisation may be considered defensive by some, given large tracts of coastline opening up to potential adversaries due to climate change. On the other hand, such militarisation may also be thought of as possessing potential offensive capabilities to assert its claims, which are incompatible with international law. To counter these perceived unilateral actions by China and Russia in the Arctic, NATO members led by the USA have increased their deployment in the region. In the aftermath of the Cold War and till the annexation of Crimea by Russia, NATO was a reluctant player in the region. Increased deployments have also been a result of anxiety in NATO strategic circles about the intentions of China in the region. The USA perceives the actions of China as yet another challenge to its interests. Therefore, NATO deployments are as much a response to Chinese ambitions as they are to Russian, with the following future scenarios plausible: -

- A New Cold War in the Arctic where China and Russia are likely to expand their joint efforts in the Arctic. This encompasses both economic and military activities. This will pose a formidable challenge to the supremacy of NATO, which will push back harder. The Alliance members are likely to increase their militarization of the Arctic to safeguard their interests and negate any balance of power shifting in favour of Russia and China.
- Conflict in the Arctic is less than likely but remains the most dangerous scenario. Increasing militarisation of the Arctic by both, Eastern Powers (Russia and China) and Western Powers (the USA and Allies) may result in some miscalculations, which may culminate in a protracted or full-blown conflict in the region. De-coupling of strategic lines of communication after the Russian invasion of Ukraine further exacerbates this scenario.

- The Arctic has a history of cooperation to resolve outstanding issues. The Arctic Council, of which Russia and the USA are full members and China, an observer, has played a vital role to push for dialogue and negotiations to resolve outstanding issues. All states have strategic interests to solve issues through negotiations since conflict will not be a preferred option. However, the process will require strategic dialogue and compromises on part of states, which most of them at present are unwilling to make.

It can, therefore, be deduced that the situation in the Arctic will remain uncertain in the foreseeable future. While the possibility of a conventional conflict remains low given the three major powers nuclear capabilities, emerging strategic competition will have a significant impact on the economic and security dimensions in the region.

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ADMIRAL KANHOJI ANGRE: A VISIONARY LEADER

Commodore RS Dhankhar (Retd)

Background

Even though the Western Coast of ancient and medieval India had a rich tradition of intrepid seafarers who engaged in maritime trade and commerce with the Gulf and East African countries, none attempted to establish a naval power to dominate the seas till Shivaji's time. During his consolidation on land, he realised early that for the overall well-being and prosperity of his people, it was essential to have a fighting fleet of his own for defensive and offensive operations along the Konkan coast. The year 1659 holds special significance in Maratha military history because in this year Afzal Khan's expedition was foiled and the hull of the first Maratha naval vessel was laid in a creek near Kalyan.[1]

Shivaji expanded his navy rapidly, which included the construction of multiple naval bases and fortifications along the coast of present-day Maharashtra. In February 1665, he led an expedition to Barcelore (modern-day Basrur), in a fleet comprising 85 frigates and three bigger ships.[2] The Portuguese, who were the sovereign power at sea with their capital city at Goa, had acknowledged the strength of the Maratha Navy by sending an emissary during Shivaji's coronation as *Chattrapati* in 1674. The coronation described Shivaji's empire extending up to the limits of the oceans.[3] However, it takes several decades to build a strong navy. Shivaji, in twenty years, could hardly be expected to create a powerful navy, but to his credit, Shivaji left a legacy of naval power behind. He had driven out the *Siddis* from the mainland; established control over Khanderi Island; and in 1670 had concluded a treaty with the Portuguese, for free coastal sea trade; and in 1680 with the English, for retention of control over Khanderi. His legacy was carried forward ably by Kanhoji Angre in the subsequent years.

Kanhoji's Childhood and Early Naval Career

Kanhoji was born in 1669 in the small village of Angarwadi, six miles from Pune, from which he picked up the surname Angre. The original name of his ancestors was *Sankhpal*. Kanhoji's father Tukoji had served at

Suvarnadurg, under Shivaji, with a charge of 250 men.[4] As a child, Kanhoji grew up among Koli sailors and was educated by a Brahmin at Harnai village near Suvarnadurg. Immediately upon completing his education, at a very young age, he joined the Maratha Navy to follow in the footsteps of his father to serve the motherland. Kanhoji was a bright lad with a sharp mind. Being a keen learner, he became adept at seamanship amongst the Kolis. Realising his motivation and dedication, Maratha Commander Bhim Rao, better known as Sidhoji Gujar, took Kanhoji under his tutelage. He quickly refined his skills in swordsmanship, riding, archery, map reading/ navigation and the use and deployment of cannons/guns. Kanhoji was part of the Maratha Fleet attack on the *Siddis* in October 1682 at the mouth of Thane River, in which the Maratha force was routed.[5] Very early in his career, he learnt the bitter lesson that it was foolhardy to plunge into a naval battle without a detailed appreciation of the situation.

He made up his mind to fully acquaint himself with the strengths and weaknesses of the Maratha Fleet as well as of those of the adversaries. He sailed in different types of men-of-war; namely *Gurab*, *Gullivat*, *Shibars* and *Pal* and keenly observed and examined training levels and motivation of Maratha sailors, their expertise and professional competence in handling, manoeuvring and navigation of ships. He learned the nuances of the formation of ships, their deployment and tactics during encounters at sea. On his own initiative, on the quiet, he visited various types of warships of the Portuguese, Dutch, English and even the main adversary of the Marathas at the time-the *Siddis*. He gained detailed knowledge of their capabilities, training and tactics. He soon realised that compared to the Europeans and *Siddis*, the numbers and capabilities of the Maratha Navy were far less and inferior. Many of the ships were old and in a dilapidated state, lacking in sea and combat worthiness. The bulk of the crew consisted of Kolis and Bhandaris, a hardy race of coastal fishermen, known for their courage and endurance at sea. However, most captains of the ships were Muslims and the gunners and engineers were European mercenaries. The loyalties and leadership that a native has towards nation-building could not be expected of them. After Shivaji's death, the Maratha naval officers were recruited on a recommendatory basis, and actual merit was given a go-by. Training and organisation left much to be desired. Professor SN Sen says in his book, "In its organisation, in the type of men of war, in its policy of selling permits and making prizes of merchantmen that didn't possess it and

in the art of science of Maritime warfare, the Maratha Navy remained where Shivaji had left it, until at the beginning of the next century when its control passed from a Chattrapati to a family of hereditary naval chiefs."[6]

In 1688, the *Siddis* attacked Suvarnadurg in which Kanhoji was one of the Officers-in-Charge of 25 men. The fort commander, Achloji Mohite, wanted to surrender, but Kanhoji and his associates refused to do so, and in a coup placed him under arrest, ultimately managing to save the fort. Sambhaji, Shivaji's son, who was *Chattrapati* at that time, thereafter appointed Kanhoji as Commander of Suvarnadurg.

Kanhoji's Rise in the Navy and Consolidation of the Maratha Fleet

In 1689, on Sambhaji's capture and death by Aurangzeb's forces, his stepbrother Rajaram took over as the king. As he was also being hunted by the Mughal army, he escaped to the Jinji fort on the East coast of India. He was accompanied by his shadow cabinet including Sidhoji Gurjar, who was appointed as the Naval Forces Commander; *Surkhel* (Admiral) by Rajaram.[7] Kanhoji was appointed as Deputy Commander and given charge of the northern coast of Konkan which included Suvarnadurg, Gheria (Vijaydurg) and Kulaba as major sea forts. In absence of Sidhoji, the overall responsibility of the Maratha Fleet fell on Kanhoji. At the time, he had 8-10 dilapidated ships under him. The overall situation was grim and the future looked bleak, as apart from the battered ships, the coastal forts and garrisons were battened down. There was hardly any income as the land of these forts was under Mughal army domination and the ships incapable of extracting any levy from merchantmen.

From 1689 to 1698, the Maratha Empire was in its worst phase

From 1689 to 1698, the Maratha Empire was in its worst phase as its ruler was in exile at Jinji and most territories were dominated by Mughal forces. Only isolated forts were being held by local Maratha Chieftains. Kanhoji utilised this period to consolidate his position and build up his Flotilla. After intensive training and workup, he started deploying his ships to police the coastal waters to extract tax (*Dastak*) from all merchantmen that didn't carry Maratha papers. Apart from generating revenue, he aimed to drive home the message that the Western coast was the domain of Marathas. Vessels of all nations were attacked between Bombay and Travancore.[8] In1695, Kanhoji shifted his headquarters from Suvarnadurg to

Kulaba sea fort, as it was strategically located between *Siddis* at Janjira and the English at Bombay. The Portuguese local base was also located in the near vicinity of Chaul. Both Khanderi and Kulaba provided him excellent monitoring posts over shipping in the area. In 1698, the *Siddis* blockaded Kulaba for six months and raided Angre's territory, but he refused to be drawn out into a pitched battle with a superior force on the chosen grounds of Kassam Yakoot Khan. However, as the *Siddis* withdrew, Angre launched a counter-offensive and plundered the *Siddis* controlled territory around Thal. By now Kanhoji had transformed his Fleet into a cohesive fighting force. He had also reconquered large parts of the Konkan hinterland without much help from Rajaram.[9] The locals and foreign powers had already started calling his fleet, '*Angria's Navy*.' Rajaram on his return in the summer of 1698 designated Kanhoji as *Surkhel* or Grand Admiral of North Konkan. Despite operating independently for nine years, Kanhoji had remained loyal to the house of Shivaji.

Angre administered the coastline from Murud to Goa and levied Chouth

By 1700, Aurangzeb annexed Satara and Rajaram died during his escape at Sinhgad fort. Tarabai, Rajaram's widow laid claim to the throne as a Regent of her son. Angre abstained from attending the transfer of power proceedings at Sinhgad, but declared himself as a servant of the throne, working for salt and bread. He had the least interest in courts and courtiers.[10] By now Angre fully administered the coastline from Murud to Goa which was subject to *Chouth* levied by him. He had also started issuing tax permits (*Dastak*) to all ships plying off Konkan. This was despised and considered a hostile act by the Portuguese and English. The Portuguese had declared themselves as the sovereign power at sea and had imposed their own *Cartaz* from the early 16th CE. Even the Mughal and *Siddi* ships trading with Arab countries had to have Portuguese permits. East India Company (EIC) ships had also enjoyed free use of seas for almost a hundred years and considered it their right to do so. The *Siddis* had shifted their loyalties to Aurangzeb in 1677 and received annual maintenance of Rs 4.0 lakhs for their fleet. The English helped them with good quality gunpowder and cannons so that they could keep Angre engaged. The power of *Siddis* had gone up greatly on the Konkan coast and was practically unchallenged till 1683.[11]

All these powers were working towards cutting Angre to size. Between 1700 and 1707, the English targeted and seized all ships carrying Angre's

Dastak and the *Siddis* regularly raided forts and territories on land. Angre's forces both on land and sea retaliated in equal measure. In 1704, Angre sailed with 7 *Gallivats* and anchored off Bombay. His mere presence blockaded Mumbai harbour, paralysing English shipping and trade. After a week he sailed back triumphant without firing a shot or exchanging a word with the English.[12] There was a state of neither war nor peace, but both sides kept taking a heavy toll on each other. By 1706, the English had started calling Angre a Pirate as it suited them to show losses and gobble up Company's profits. The EIC records state that Angre had taken various types of English-flagged vessels to the tune of lakhs of rupees.[13]

Kanhoji's Commitment to the Navy during Maratha Power Politics

In 1707, the deaths of Aurangzeb and *Siddi* Kassam Yakoot set in motion a series of power realignment events. Sahuji, the grandson of Shivaji, held captive by Mughals since 1689 escaped and staked his claim to the Maratha throne as the rightful heir. Tarabai called him an imposter and refused to relent power. In October 1707, when their respective forces faced each other at Khed, Sahu's minister Balaji, persuaded Tarabai's powerful military commander to switch loyalties. Tarabai was forced to escape to Kolhapur and Sahu established himself at Satara. At the Panhala Conference, most Maratha Chieftains swore an oath to serve Tarabai. Kanhoji had not gone there but swore his loyalty to Tarabai. She announced him as 'the Overall Commander of the Maratha Fleet.' His new seal of office proclaimed Angre to be '*Surkhel* Forever and Viceroy of Konkan.'[14] *Siddi*'s son, Rasool Khan realising the growing power of Angre, made peace with him, but a new landward threat emerged from Sahu's forces. Kanhoji was however, not inclined to pick up a fight with Sahu's Maratha forces.

He instead, utilised this period of uncertainty to focus on the consolidation of his fleet, fortification of coastal stations and strengthening of posts. The whole coast from Bombay to Goa was in his hands and there wasn't a creek, harbour or river mouth where he had no fortifications and boat stations.[15] He upgraded his Fleet on European lines, established shipyards and engaged hundreds of artisans to build ships. Sailors were trained, uniformed, disciplined and well-paid. His terms of service were the best, which attracted talent from the Dutch, Portuguese, Arabs, Muslims and *Siddi* Africans. This enabled him to build better and stronger ships and increase the efficiency of his equipment and men.[16] By now, he had 10

Ghurabs (16-30 Guns) of 400 tons each, 50 *Gallivats* (4-10 Guns) and many other supporting vessels. He took special care and interest to work up his fleet into a combat-ready force.[17]

Kanhoji always strove not to have more than one enemy at a time.[18] As his fleet was strong and the main threat remained from Sahu's forces, he proposed and concluded a peace treaty with the Bombay Council in April 1713. In the following month, Sahu dispatched his Peshwa, Bahroji Pant Pingle to attack Kanhoji. Having foreseen such a contingency, Angre was well prepared for it. He allowed Pingle's forces to come through the Bhor Ghat, and instead of a head-on battle, he went from behind and occupied Rajmachi and Lohgad forts dominating the pass between Deccan and Western Ghats thus, sealing off the escape route of the enemy. He completely routed the Peshwa and imprisoned him.[19] He sent a message to Sahuji that he would soon be marching to Satara. In his continuing land campaign, Kanhoji took over seven more forts. Meanwhile on the seafront, in mid-1713, the Portuguese in conjunction with *Siddis* attacked Kulaba. He chose not to respond as his ships were already hauled up ashore out of the gun ranges of the Portuguese. After three months of siege, they withdrew. Sahuji in a desperate situation sent Balaji to negotiate with Angre. A treaty was ratified in Kulaba on 08 February 1714, according to which Kanhoji accepted Sahuji's suzerainty as a *Chattrapati* as Tarabai's claim was already usurped by Rajasbai, the second wife of Rajaram and her son Sambhaji. In return, Angre obtained control of 10 Sea Forts and 16 Land Forts, with rights of revenue of Rs 36 lakhs annually. Sahu also offered military assistance, whenever asked for by Angre. He was confirmed as *Surkhel* and *Vazarat-Ma-Aab* in hereditary perpetuity. Angre started signing his letters as 'Kanhoji, son of Tukoji, *Surkhel* by the grace of King Sahu.' His seal read '*Sahu Karya Dhurandhar Tukoji Tamjanmanch Kanhoji Surkhaillasya Murdikeyan Vijarate*.'[20] Seeing this realignment, the *Siddis* also concluded a treaty with Angre in the presence of Balaji on 30 January 1715, resulting in a decade-long peace between them.

On securing his land fronts and having the benefit of assistance from Sahu's forces, Angre focused his attention on the rising power of the English at sea, who weren't following the 1713 treaty. Mr Charles Boone, the new Governor of Bombay, who had taken over in 1715, had embarked on the rapid addition of new ships and fortification on land. By 1718, he had added 19 ships carrying 220 guns, besides Bomb Vessels and Fire Ships.

Secret orders were issued to seize or sink all ships encountered carrying Angre's *Dastak*. On the other hand, Angre had been sparing ships genuinely belonging to the Company. This ended in April 1718, when Angre issued a warning stating that "our friendship is over and from this day forward, what God gives, I shall take."[21]

With open hostilities, the EIC launched a secret attack on Gheria on 10 June 1718. However, Angre's ships, because of the impending monsoons were already hauled up well inside the cove and a strong boom was erected across the channel. The intense shelling fell well short without any damage to the fort or ships. After this futile attempt, they returned to Bombay on 18 June 1718. Another attack was mounted on Khanderi from 05-14 November 1718, which was again repulsed by Angre's men with heavy losses on the Company forces. After the attack, Angre's ships from Gheria blockaded Bombay harbour for two of the best sailing months. In January 1719 when the English ships came out to seek battle, they found that Angre's ships had already retreated.[22]

The EIC persuaded the Portuguese Governor for a joint assault on Angre

The EIC Fleet under command of Mr Brown again attacked Gheria Fort on 18 September 1720. During the initial bombardment, shots fell short. Another attempt was made to send in a landing party after further closing in by ships under cover of shelling on 29 September 1720. This assault also proved unsuccessful and the ships languished off Gheria till 18 October 1720. They finally sailed out for an attack on Angre's Devgarh fort to help out the local Sawant of Wadi. The bombardment of Devgarh also had no effect. Mr Brown's flotilla on their return passage to Bombay, on 22 October 1720, ran into pirates and in an ignominious fashion, the greater part of the fleet was harassed for two days by the pirates.[23]

After these repeated unsuccessful attempts against Angre, Mr Boone persuaded the Portuguese Governor into an alliance for a joint assault on Angre as the Royal Navy Squadron under command of Commodore Thomas Mathew had also arrived at Bombay on 27 August 1721. It had four warships with 110 guns. On 10 December 1721, the combined Anglo-Portuguese land force comprising of 6000 infantry, 200 cavalry troops, 8x24 Pounder guns, 8x18 Pounder guns and several small guns supported by 10 warships with 300 heavy guns launched an attack on Angre's Kulaba fort.

Kanhoji, seasoned by numerous attacks on his forts, was well prepared

as he had kept all developments under surveillance. His efficient spy network provided him with latest inputs. Angre could read the enemy's plans like a book.[24] In anticipation of events, he had already requested Sahuji to send land forces to help. An advance party under Pillaji Jadhav comprising of 1500 cavalry and 1000 infantry was already on standby near Alibaug. Kulaba Fort was adequately stocked up with provisions and ammunition and had 1000 infantry and 700 cavalry troops stationed within. Angre adopted an offensive defence strategy and asked Pillaji to launch a pre-emptive attack on the enemy's base camp on 20 December 1721 with limited success. The final assault on the fort by English forces on 24 December 1721 was beaten back successfully by Angre's defence. He asked Pillaji to attack the Portuguese forces waiting on the beach. The cavalry charge of 1500 Maratha men smashed through the enemy, scattering them in all directions. Pouncing on the opportunity, Kanhoji sent his cavalry from the fort on the retreating English. The ships under Commodore Matthew were of no help as the scene of action was beyond their gun range. The enemy force was completely defeated, on the morning of Christmas day, 25 December 1721.[25]

Angre adopted an offensive defence strategy and launched a pre-emptive attack

Kanhoji could have easily decimated the remaining Portuguese forces but chose to offer them a peace treaty from a position of strength. By now the remaining Maratha land forces of 25000 men under Bajirao had also arrived. The treaty was concluded on 9 January 1722, in which both parties agreed to mutual support and open their ports to each other. The Portuguese also agreed to supply to the Peshwa with much-needed guns and ammunition at reasonable prices.[26] This revived the old rivalry between the English and the Portuguese as they blamed each other for the loss in battle. The *Sawant* of Wadi had collaborated with the Dutch to attack Gheria in January 1724 with seven ships having about 300 guns and 3000 men. This was also repulsed successfully by Angres' men with heavy losses on the Dutch. By February 1724, Bajirao facilitated a peace treaty between the *Sawant* and Angre. In 1725, *Siddi* Rasool Yakoot Khan, well-supplied by the English with guns and ammunition, was persuaded to blockade Kulaba with a force of about 6000 men and more than 100 ships. Angre instead of taking him head-on, smartly bribed him into a settlement.[27]

From then onwards, Angre became bolder than ever and began to seek

out the Company's fighting as well as merchant ships and shifted to efficient administration and governance of Konkan for its overall prosperity. He built a fortified port at Purangarh in the Ratnagiri district. He established a township called Alibaug, the main village being today's Ramnath. He introduced his coin called *Alibaugi Rupaiya*. He improved education, productivity of rice and established an efficient postal service. He was the first ruler of Konkan who thought about the conservation of forests.[28] There was no naval power to challenge the supremacy of Angre's fleet off the Konkan coast, right up to his death in 1729. Victorious alike over the English, Dutch and Portuguese, "The Maratha Admiral…" as an English historian declared, "…sailed the Arabian Sea in triumph."[29]

Angre's Strategy and Tactics

Shivaji, followed by his son Sambhaji, despite driving the *Siddis* out of land territories were unable to uproot them because of their fleet and the Janjira sea fort. This was evident to Kanhoji as a young lad during the futile assault on the *Siddis* in 1682. His long-term strategy therefore, was to build a strong Navy and strengthen fortifications along the coast. Only by doing so, the Maratha Navy would be able to exert its influence in the Konkan Coastal region. His aims and objectives were already set - to protect the Maratha merchantmen from pirates and foreign powers at sea, Maratha subjects were to be protected against depredations of the *Siddis* and the sovereignty of the sea was to be secured for the Maratha state. He worked relentlessly to fulfil his strategic vision. The forts were armed and provisioned against attack from the sea as well as a blockade. Dockyards were constructed behind the citadels. Expert craftsmen, artisans, shipbuilders and gun casters, which included foreigners, were employed and settled in localities developed behind the fortress. This was followed by the creation of operating bases, observation posts and anchorages all along the coast to supplement the fleet strength and gather intelligence. In his early days, he never attacked anyone or made any new enemies. He started deploying his ships innocuously in a policing role to extract taxes.

Angre shifted his Headquarters to Kulaba in 1695 as it was strategically located between the English and *Siddi* powers. He never lost control of Khanderi Island, which enabled him to monitor the shipping traffic in and out of Bombay harbour, being the hub of sea trade, as were the inland forts of Rajmachi and Lohgad used to keep watch on the movement between

Konkan and Deccan.

He scrupulously avoided a major showdown with superior enemy forces. When the *Siddis* blockaded Kulaba in 1698, he refused to be drawn into battle on the chosen ground of Kassam Yakoot Khan. He advised his fort commanders also not to recklessly plunge into battle with superior forces and avoid unnecessary risks. The failed attacks of the English on Gheria and Khanderi were a result of such a strategy. On the other hand, he utilised his fleet to blockade enemy harbours effectively. Bombay Council got the message and felt it imperative to resuscitate the treaty of 1698. In 1713, when the Portuguese launched an attack on Kulaba, he again chose not to respond and after three months of siege, they had to withdraw in frustration without any damage to Kulaba fort or his ships as they were hauled up well out of range of *Siddi* ships.

He was fully aware that his ships were no match to the European ships, which had superior weapons, were better designed, more strongly built, capable of absorbing more punishment and had better sea-going qualities. As a corollary, he emphasized better tactics and leadership to utilise his own fleets' strengths against the enemy's weaknesses. He saw that the only way Marathas could overpower these superior ships was in hand-to-hand combat after boarding them. To achieve this, he resorted to the following tactics: -

- Not to engage European ships at high seas, but instead chose his waters close to the coast and isolated them so that they were unable to provide mutual support.
- He chose his Captains who were locals, daring, professionally efficient and familiar with coastal waters.
- His ships invariably operated within the sight of their coast and kept themselves between the enemy ships and the coast. They attacked from the leeward side so that when the enemy ships turned to attack, their ships could drop away further to leeward and sneak into shallow waters or in the range of coastal guns. The enemy ships were often lured within their range. He had attained such a competent, professional reputation that a Portuguese writer had compared him to the famous Ottoman Admiral, Barbarossa.[30]
- As the foreign ships closed the coast, they had to reduce sail and slow down. Angre's ships lying in ambush in coves would then dash and chase them in their row boats. They would approach them from the rear

to avoid a broadside, presenting as small a target as possible. When in range of their guns, they would straddle their rigging and quickly board them. He ensured that at least twice the number of swordsmen, as the crew on board the enemy ship, were sent in to engage in hand-to-hand combat.

- Wolf pack tactics were followed to cater to the disparity of his forces concerning speed, seaworthiness and firepower. Kanhoji operated with large numbers of light craft, specially built for their speed and manoeuvrability, akin to the Maratha ponies used by Chattrapati Shivaji to create panic amongst the traditional Mughal armies in the Deccan.[31]

As brought out earlier, he generally strove to avoid having more than one enemy at a time. Realizing a greater threat from Sahuji, Angre concluded a treaty with the British in 1713, which essentially entailed the stoppage of hostilities between the two. The same year, keeping the larger interests of Maratha power in mind, he showed wisdom and moderation by making peace with Sahuji from a position of strength. He had already imprisoned Sahuji's Peshwa, Bahroji Pant Pingle, sent to mount an attack on him. In acknowledging Sahuji's supremacy, he recognized the right of the stronger of the two claimants (Sahuji vs Tarabai) to the title of *Chattrapati*. After the humiliating defeat of Anglo-Portuguese combined forces at Kulaba in December 1721, he again chose to conclude a peace treaty with the Portuguese from a position of strength. During the Maratha power struggle, as a military leader, he steered clear from state power politics and remained ever-loyal to the *Chattrapati*.

Conclusion

Shivaji Maharaj had striven to establish a *Hindavi Swarajya*, for which he laid a strong foundation with a national banner and common objective. Kanhoji Angre was inspired by Shivaji's example of nationalism and therefore had joined the Maratha Navy at an early age. He grew up to be an intelligent, strong and professionally competent leader, who was dedicated to the cause of making the Maratha Navy strong in furtherance of the goal of nation-building. He rose rapidly in the Navy because of his administrative ability, initiative and ingenious thinking towards naval warfare and tactics. He mastered the art of guerrilla warfare at sea along the lines of Shivaji on land, avoided outright battles on the high seas with stronger adversaries and

lured them to places of his choosing. Both during land and sea battles, he demonstrated evidence of not only good seamanship but also of wily diplomacy. On assuming the command of the Maratha fleet as *Surkhel* at a young age of 30, he displayed clarity of thought and strategic vision. Accordingly, he prioritized in-house creation of resources and facilities to build modern ships, fortify coastal defences, as well as neutralizing/weakening the threats posed by the *Siddis*, Portuguese, English, Dutch and *Sawants* of the Maratha state. He was prudent enough to enter into peace treaties with countrymen and foreigners alike, as the situation warranted at that time, and avoided opening many fronts at the same time. In his dealing with foreign powers, he could hardly be accused of treachery or faithlessness.

He remained loyal to the state, even when it was at its weakest after Rajaram's death. He had a single-minded focus on strengthening the Navy, the Maratha state and always honoured treaties entered into by the State. He left behind an extensive province and respectable fleet to his heirs, which added immensely to the prestige and power of the Marathas. It can be said that if Shivaji was the founder, Kanhoji resurrected the Maratha Navy. His strategic vision breathed new life into the Maratha fleet and left behind a strong legacy for his successors to follow.

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ATOMS FOR PEACE? INDIA'S SSBN FLEET AND NUCLEAR DETERRENCE

Rear Admiral Sudarshan Shrikhande (Retd)

Editor's Note: This article is reproduced here with the permission of the Australian National University's National Security College. It formed Chapter 11 of their publication, *The Future of the Undersea Deterrent: A Global Survey*, published in 2020. Given India's efforts towards enhancing nuclear deterrence stability, SSBNs are likely to remain very central. Indian governments, the Indian Navy and DRDO and the later architectures created have all been important, visionary steps.

India does not gain anything by escalating the nuclear arms race in the region with INS Arihant.[1]

- Chinmaya Gharekhan

India is developing sea-based nuclear deterrence in accordance with its nuclear doctrine ... to reinforce nuclear deterrence, supported by corresponding operational capabilities and procedures for optimal deployment, in keeping with national policy.

- Indian Maritime Security Strategy[2]

On 5 November 2018, some of the crew of INS *Arihant*, India's first nuclear-powered ballistic missile submarine (SSBN), were congratulated in New Delhi by Indian Prime Minister Modi after India's first deterrent patrol. Indeed, it was an occasion to mark: "The surge of national pride at the recent completion of 'deterrent patrol' by the Indian Navy's first home-built [SSBN] INS Arihant, is fully justified," wrote Admiral Arun Prakash, though not without adding some cautions.[3]

India's journey in building its own nuclear deterrence capabilities has been a long one - a bit too long and a bit too slow. Strategic indecision and perhaps inadequate cohesion more than technological impediments were factors that led to lost opportunities in terms of permanent membership of the UN Security Council; becoming a nuclear-weapon state (NWS) before the non-proliferation treaty of 1968; and, in general, finding a seat at the

high table of world politics.[4] Some scholars have thought of a nuclear India more as a matter of "prestige" than a necessity.[5] This is a charge often made about those nations that play catch-up with early starters, as seen in the case of battleships, aircraft carriers, space flights, and even in winning Olympic medals.

Historical Rationale for Indian SSBN Construction

Space does not permit tracing the history of India's SSBN program; however, a brief but authoritative account by Admiral Prakash can be recommended.[6] We should draw out four key points from history as outlined below. First, it is difficult to agree that India stumbled into making an SSBN while trying to develop reactors for nuclear attack boats.[7] Until the May 1998 nuclear tests, India had never admitted to a nuclear weapons capability at all. Therefore, to indicate that there indeed was a diesel-electric ballistic missile submarine (SSB)/SSBN program would have been ill-advised. One can imagine the effort put into the deception that led to beliefs that only nuclear-powered attack submarines (SSNs) were on the drawing board. The very name, Advanced Technology Vessel Programme (ATVP), seemed opaque, but less so than the Manhattan Project (1939-1946). There is insufficient understanding in the West about Indian deception strategies (and even stratagem) used to keep the SSBN and other programs covert. (*Author's additional note*: This was due to the constraints and realities of the international strategic-diplomatic international environment in which India conducted its discourse.) Today, the ATVP remains focused on SSBNs, but SSNs could well follow. While deception strategies were largely successful, not all decisions on delivery vehicle development were cohesive and beneficial.

Today the ATVP remains focused on SSBNs, but SSNs could well follow

Secondly, we can infer that covert developmental strategies of the other legs of the triad were underway before the 1998 nuclear tests so that when India went overt with its capability, the tasks of operationalising delivery vehicles would be quicker. Therefore, while the grand vision and will for going nuclear may have been constrained, delivery development was relatively well-conceived. The problems lay in slow manufacturing and testing processes. The need to gain experience in operating nuclear submarines led to the leasing of the first SSN from the USSR in 1988. At this

time, India's defence strategy focused its energy on the maritime leg of the envisaged triad.

Thirdly, many features of the command and control (C2) framework necessary for sea-based nuclear deterrence to deploy operationally, survive tactically, and launch strategically were also applicable for C2 of conventional boats and the leased SSN. Accordingly, a Very Low Frequency (VLF) radio communications programme was put in place in the mid-1980s. The key partner for this was an American company.[8]

Fourthly, the assumed change of type from SSN to SSBN as the focus of India's nuclear submarine program has been called an afterthought. As explained, this was not the case. Nonetheless, there are parallels elsewhere that underscore SSN/SSBN compatibilities.[9] For example, the first US Navy SSBN, *George Washington*, and four follow-on Polaris boats were derived from the Skipjack SSN design. The *George Washington* (SSBN 598) was laid down as SSN 589 (Scorpion) on 1 November 1957, but re-designated SSBN 598 on 31 December 1957.[10] On the contrary, the French began - like India - with SSBN construction. The *Redoubtable* was laid in 1963 and commissioned in 1971. However, France was not under any constraint to keep this covert.[11]

For any nation, deterrence is about substance and not symbolism

Towards Deterrence

In the weeks after *Arihant's* launch in 2009 and its first deterrent patrol in 2018, the media in India (and its similarly raucous counterparts in Pakistan) did end up chest-thumping and fist-shaking. Chinese media were less noisy but angry and dismissive.[12] This, along with high-pitched Indian political messaging in 2009 and 2018, ended up conveying that there was a game-changer on the scene. Shorn of the hyperbole, *Arihant* is not yet part of the deterrence architecture in a meaningful way. After all, for any nation, deterrence is about substance, not symbolism; spin is not necessarily nuclear signalling; and adversaries always have a vote on feeling deterred. Yet, the *Arihant* is an important first step towards establishing sea-based nuclear deterrence. An aspect this author examines in his doctoral research relates to the interplay of quantitative and qualitative factors that feed into the effectiveness of sea-based nuclear deterrence. This seems to be especially important in India where quantitative factors regarding the number of delivery vehicles possibly "pointed" towards India are a bit too

easily explained away by the quality that Indian credible minimum deterrence, or even just credible deterrence, is supposed to provide.[13] Hence, here are some aspects to consider as we later examine the impact of India's SSBN fleet. It would be logical that in case of a single-front conflict with either Pakistan or China, the nuclear alert posture of the other non-engaged adversary would also be higher. In a two-front situation - good strategic planning implies that hardly any scenario should be off the table - the seriousness of the issue increases. Going by data from the Bulletin of the Atomic Scientists, the number of China's warheads is 280-300 (say, "X"), Pakistan's 140-150 (say, "Y"), and India's 130-140 ("Z"). Pakistan and India are almost matched, but Pakistan's accretion rate is presumed to be higher.[14] The gap may grow. China alone or (X)+(Y) creates quantitative challenges for credible or credible minimum deterrence for India with Z vectors.

Deterrence stability is not about arithmetic, but vector numbers do matter. "Z as significantly lesser than X+Y, represented in a formulaic manner as (Z<< X+Y)" could be seen as a curious twist of the Royal Navy's "two-power standard" for force structuring at the zenith of British power.[15]

Numbers matter, they always have, even when they reached high five digits at the peak of the Cold War. The Indian architecture of deterrence is weakened by the possibility of a counterforce first strike and the resulting loss of delivery vehicles. It is at such a time that the other adversary's arsenal would be at a higher state of readiness - and therefore, a greater threat. With reduced capabilities and shrinking windows for retaliation, India's quantitative disadvantage increases and the qualitative value of credible minimum deterrence declines, since massive retaliation or a variant (unacceptable damage) both rest on the evaluation of surviving retaliatory capability.[16]

Given the distinct possibility that either or both likely adversaries may launch a certain number of conventional missiles against nuclear and non-nuclear targets in India, the limited future ballistic missile defence capability may deplete rapidly. Is a non-nuclear strike against India's nuclear forces to be a trigger for massive retaliation, especially when either adversary retains some capabilities for follow-on counterforce or counter-value strikes?

These are uncomfortable scenarios, but very much a part of strategic planning and force-structuring that actually feed into deterrence itself.

Comforting as it may seem to think of nuclear weapons as political rather than military weapons, the stability of deterrence and effectiveness of any country's nuclear arsenal depends on its organisation, C2, readiness, training, lethality, spread, and survivability. It is also useful to remember that even an assassin's/commando's bullet, grenade, or explosive vest is a political weapon in so far as some ends of political purpose were envisaged in its very existence and use.[17]

Bolstering Deterrence Stability

Therefore, India's choice to build SSBNs before SSNs was wise, accepting the great cost, and technological and operational challenges. Doctrinally, the Indian Navy has long acknowledged the criticality of deployed SSBNs for deterrence stability.[18] Undoubtedly, risks are inherent in nuclear deterrence architectures in any environment. Among others, these are argued well by Medcalf and Thomas-Noone. Yet, as they point out, Indian SSBNs could be part of long-term stability. One observation is particularly profound: "Not everything in geopolitics gets worse all the time. Assuming that lessons are learned and potential crises managed in the decade ahead, advances in Chinese and Indian SSBN and SLBM [submarine-launched ballistic missile] technology may eventually contribute to a new phase of relative strategic stability where the existence of nuclear weapons keeps the peace and prevents their use."[19]

Deterrence instability requires watching, prevention, and sometimes even leveraging it for getting the upper hand in the deterrence matrix. Pakistan has used such leverage a few times. However, instability ought not to be conflated with either a collapse of deterrence or bringing matters closer to collapse. A collapse could occur even under conditions of stability and balance of nuclear power.

To Deploy Operationally, Survive Tactically, and Launch Strategically

For at least two more decades, India's sea-based nuclear deterrence capability will fall short in qualitative and quantitative terms, unless India puts in more resources. Specifically, *Arihant* seems to have twelve very short-range K-15 SLBMs with a reported range of 700-1,000 kilometres.[20] However, Medcalf and Rehman both mention that *Arihant* could be modified to launch four of the K-4 SLBMs of 3,000-3,500 kilometres range. Options to deploy *Arihant* periodically seem to be limited. It can only patrol

against Pakistan and is at significant risk of being "marked" frequently.[21] Therefore, four of the K-4s, rather than twelve of the K-15s, make for better deterrence capability and the sooner this is done the better. Yet, *Arihant* has its uses to hone skills, test C2 frameworks, and yet be boldly deployed when and where imperative.

Bastions for SSBN patrol seem inevitable for India until missile ranges go beyond intermediate-range ballistic missile (IRBM) to intercontinental ballistic missile (ICBM) levels.[22] Bastions are not really a virtue. Soviet/Russian bastions in Northern waters and the Sea of Okhotsk, and for the Chinese in the South China Sea, remain vulnerable to offensive Anti-Submarine Warfare (ASW) operations. They remain preferable for these countries because maritime geography is/was a constraint, as were sonar barriers, like along the Greenland–Iceland–United Kingdom (GIUK) gap.[23] As sketched by Rehman, it seems logical that deterrent patrols even for K-4 SSBNs would have to be within the Bay of Bengal.[24] One hopes that the larger SSBN designs would be capable of doing well in qualitative and quantitative terms with SLBMs of 7,000 kilometres plus range, about sixteen capacity (desirably with Multiple Independently Targetable Re-entry Vehicles (MIRV)), and a refuelling cycle that permits about ten to fourteen-year intervals, thus giving about 40 years patrolling life with two interruptions for refuelling.[25] Like the United States, India has geographic advantages for SSBNs to go on open ocean patrol, once they field long-range SLBMs. We need to move beyond bastions in which the enemy's offensive ASW could be more effective, to beyond such confining areas where our own resources needed for defensive ASW, would be reduced.[26]

Continuous At Sea Deterrence (CASD) for India may need to be a bit different from the models that the United Kingdom and France follow.[27] Their "one-in-four" systems put one of the four SSBNs on patrol. Their SLBMs have multiple warheads such that one single SSBN has the potential to launch several dozen warheads. This makes the "weight" of their deterrence with just one boat on patrol quite different from that of India's SSBN. For India's considerations, six to seven boats with a two-boat CASD and surge of up to four SSBNs could give a measure of deterrence effectiveness for two purposes: via retaliatory counter-value strikes; and, given increased accuracy, the threat of counterforce strikes. India's No First Use (NFU) doctrine could change and potentially strengthen stability. In any case, no nuclear weapon state can really gain through nuclear high-

handedness. Pakistan slowly will realise this. Its moves for getting its own low-cost, sea-based nuclear deterrent, based on nuclear-tipped cruise missiles are a major concern. India and its friends around the globe could cooperate in strategic ASW to keep Pakistani boats marked. Redundancy and survivability of the C2 systems including their cyber-hardening is probably an ongoing priority for the government and the Indian Navy. Talk in India, and occasionally elsewhere, about the risks of mated missiles in India's SSBNs are just red herrings. One imagines that robust Permissive Action Links and safeguards are in place.[28] Finally, for India, there is much work and expense ahead as the reliance on sea-based nuclear deterrence in terms of its quantitative and qualitative effectiveness is enhanced. There may be some phases of instability that need to be evaluated, countered, and even leveraged. On balance, Indian SSBNs could become the most critical leg of the "atoms for peace" triad.

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1 Chinmaya R. Gharekhan, "Deterrence or Danger," *The Hindu*, January 3, 2019, https://www.thehindu.com/opinion/op-ed/deterrence-or-danger/article25892848.ece.
2 Integrated Headquarters, Ministry of Defence (Navy), *Ensuring Secure Seas: Indian Maritime Security Strategy*, (New Delhi, 2015), 48.
3 Arun Prakash, "One Arihant Does Not Make for a Credible Nuclear Deterrence," *The Economic Times*, December 21, 2018. Admiral Prakash was closely involved with the SSBN project as the Navy Chief and Chairman, Chiefs of Staff Committee. Later, as a member of the National Security Advisory Board and the Naresh Chandra Committee on Defence Reorganisation, he has written extensively on nuclear security issues. The author acknowledges Admiral Prakash's generosity in sharing many of his personal papers.
4 See Bharat Karnad, *Why India is Not a Great Power (Yet)* (New Delhi: Oxford University Press, 2015), 10–13; Jasjit Singh, ed., *Nuclear India* (New Delhi: Knowledge World, 2007), 20–25.
5 Diana Wueger, "India's Nuclear Armed Submarines: Deterrence or Danger?" *The Washington Quarterly* 39, no. 3 (2016): 80. However, Wueger does not necessarily hold this view. Her article and preceding Master's thesis form comprehensive studies of the maritime leg of India's deterrent and the Indian Ocean's nuclear environment, which she generously shared with the author.
6 Arun Prakash, "The Arihant in Perspective," *Livefistdefence.com*, September 18, 2009, https://www.livefistdefence.com/2009/09/admiral-arun-prakash-arihant-in.html. This was written soon after the launch of *Arihant* by the then prime minister. While no media were present, nor any pictures of the boat published, the event was given wide publicity.
7 Wueger, "India's Nuclear Armed Submarines," 80. She terms it more "accidental than intentional."
8 G.M. Hiranandani, *Transition to Eminence: The Indian Navy 1976–1990*, Official History of the Indian Navy (New Delhi: Lancer Publishers LLC, 2004), 174. The US company was Continental Manufacturing Company.
9 Wueger, "India's Nuclear Armed Submarines." Yogesh Joshi's inferences about this point as an afterthought need some rethinking. See Yogesh Joshi, "The Imagined Arsenal India's Nuclear Decision-Making, 1973-76," *NPIHP Working Paper 6*. June 2015, *The Wilson Center*, https://www.wilsoncenter.org/sites/default/files/wp6-the_imagined_arsenal_-_ver_2.pdf. That Joshi, in his considerable research, did not find evidence of SSBNs is more due to successful deception and disinformation than strategic blundering, which led not only scholars but even insiders to draw some off-the-mark inferences. For example, see Vijay Shankar, Covenant Sans Sword (2014), Lawrence Livermore National Laboratory, online video, 1:18:11, https://www.youtube.com/watch?v=OZpIrZvP0Co.
10 Norman Polmar and K.J. Moore, *Cold War Submarines: The Design and Construction of U.S. and Soviet Submarines* (Virginia: Potomac Books, 2004), 117, https://fas.org/wp-content/uploads/2016/12/Frances-Choice-for-Naval-Nuclear-Propulsion.pdf. In the US Navy, the classification SSGN (guided-missile submarine) came about again when decades later some SSBNs of the Ohio-class were converted to fire land-attack cruise missiles. In fact, the 24 silos were converted to carry 154 Tomahawks per boat, which is very high firepower and excellent role change of SSBNs being scaled back and modified into SSGNs. With the US actively considering re-introduction of newer variants of nuclear-tipped cruise missiles, and now the collapse of the Intermediate Nuclear Forces Treaty, interesting times surely lie ahead.
11 Alain Tournyol du Clos, "France's Choice for Naval Nuclear Propulsion: Why Low Enriched Uranium was Chosen," *Federation of American Scientists*, 2016, https://fas.org/wp-content/uploads/2016/12/Frances-Choice-for-Naval-Nuclear-Propulsion.pdf. France built SSNs later, and it seems that India too is mirroring that sequence. The French tested their first nuclear bomb in 1960. That the French also prioritised resources for SSBNs before SSNs is not widely known in India. For example, see Ajai Shukla, "India Debates, China Struggles," rediff.com,

September 2, 2010, https://
www.rediff.com/news/report/nuke-subs-india-debates-china-struggles/20100902.htm.
12 Examples are too numerous for references.
13 India's public nuclear doctrine is titled *The Cabinet Committee on Security Reviews Operationalisation of India's Nuclear Doctrine*, dated January 4, 2003. See Manpreet Sethi, *Nuclear Security: India's March Towards Credible Deterrence* (New Delhi: Knowledge World Publishers, 2009), 247–248.
14 Hans M. Kristensen and Robert S. Norris "Chinese Nuclear Forces, 2018," *Bulletin of the Atomic Scientists* 74, no. 4 (2018): 289–295; Hans M. Kristensen, Robert S. Norris and Julia Diamond, "Pakistani Nuclear Forces, 2018," Bulletin of the Atomic Scientists 74, no. 5 (2018): 348–358; Hans M. Kristensen and Matt Korda "Indian Nuclear Forces, 2018," *Bulletin of the Atomic Scientists* 74, no. 6 (2018): 361–366.
15 Andrew Gordon, *The Rules of the Game: Jutland and British Naval Command* (Annapolis: USNI Press, 2012), 194. The Naval Defence Act of 1889 institutionalised the principle that the Royal Navy should be at least equal to the two largest navies combined. While neither fleet effectiveness nor deterrence is strictly about arithmetic, the Indian situation of having fewer vectors than either of the two adversaries is worrisome. The pace at which China seems to be closing the large gap with the United States in warheads is also something to think about. For China, too, quality–quantity (Q–Q) matters.
16 Arka Biswas, "Credibility of India's Massive Retaliation," *Observer Research Foundation Commentaries*, January 9, 2017, https://www.orfonline. org/research/credibility-indias-massive-retaliation/.
17 The idea of the prefix political to nuclear weapons in the Indian discourse comes from two related misconceptions. One, that its use can be only by exclusive political authority. That, of course, is very much so in India and shall remain. In most military matters, political control overrides, be it surgical strikes, mobilisation, etc. The second relates to the feeling that in Pakistan, it is the military that controls the arsenal. That may be so, but it is a matter of political detail in Pakistan that political power often originates from GHQ Rawalpindi than from Islamabad. That makes Pakistan's nuclear weapons political as well. The argument could be applied to North Korea's arsenal. It is under political control, albeit of one man. Deterring or fighting a war has to be about politics.
18 Wueger, "India's Nuclear Armed Submarines." It may be argued that the apprehensions she discusses are similar to those expressed at various stages of the Cold War. Her analysis has several useful points.
19 Rory Medcalf and Brendan Thomas-Noone, "Nuclear-Armed Submarines in Indo-Pacific Asia: Stabiliser or Menace," *Lowy Institute*, September,2015,
https://www.lowyinstitute.org/publications/nuclear-armed-submarines-indo-pacific-asia-stabiliser-or-menace. This is a very insightful analysis and, more than three years later, it retains great validity.
20 Prakash, "The *Arihant* in Perspective." Iskander Rehman, in his very comprehensive study, puts the range of the K-15 SLBM at 750-800 kilometres in Iskander Rehman, "Murky Waters: Naval Nuclear Dynamics in the Indian Ocean," *Carnegie Endowment*, 2015, https://carnegieendowment.org/2015/03/09/murky-waters-naval-nuclear-dynamics-in-indian-ocean-pub-59279
21 In terms of strategic offensive anti-submarine warfare (SOASW), marking would mean being aware of the enemy's boats much of the time. In conflict, it would be feasible then for the adversary to target SSBNs with conventional ordnance (or nuclear as well in some cases) before launch.
22 Strictly speaking, India currently fields only IRBMs (i.e. less than 5,500-kilometre range). ICBMs of about 6,500-7,500-kilometre range at the lower end of the ICBM scale would indeed open up deployment options and enhance strategic defensive anti-submarine warfare (SDASW) for India's SSBN fleet and contribute to deterrent stability.

23 It is in this context as well that if China succeeds in improving its maritime geo-strategic position, its SSBN fleets would move out of the bastion into more open waters. Among other matters, navies of Australia and Japan should expand their SOASW capacities for the vastness of the Pacific. GIUK is the Greenland–Iceland–UK gap used for transits of Russian SSNs and, earlier, SSBNs when their missile ranges were shorter.
24 Rehman, "Murky Waters," 12–13.
25 Prakash, "The *Arihant* in Perspective."
26 One of the concerns India should have is the number of Chinese People's Liberation Army Navy (PLAN) diesel-electric attack submarine (SSK) and nuclear-powered attack submarine (SSN) boats, and SSK of other navies that could someday patrol in the Bay of Bengal and Arabian Sea. These other littoral nations need not be anti-India necessarily. Their submarines would pose "friend or foe" quandaries and loss of signatures issues.
27 Sudarshan Shrikhande, "India Completes Nuclear Triad," *Strategic News International (2018)*, online video, 12:21, https://sniwire.com/defence-security/india-completes-nuclear-triad/. In the UK and French case, their CASD Q–Q is also influenced by the deterrent cover provided by the United States.
28 Wueger, "India's Nuclear Armed Submarines." She observes that "India has not yet explained how it intends to retain active civilian control over its SLBM arsenal." This author feels that India is not under any obligation to explain how civilian leadership exercises control over SLBMs. While general protocols may be inferred, the details would be highly classified for any navy that deploys nuclear weapons to sea. What can be taken for granted is that the safeguards are rigorous and would match best business practices.

CHINA'S STRATEGIC CULTURE AND ITS INFLUENCE ON SECURITY STRATEGY

Commander Murali Krishnan Chandran

Culture is the root and foundation of strategy. Strategic thinking, in the process of its evolutionary history, flows into the mainstream of a country or nation's culture.

- Lt Gen Li Jijun[1]

Introduction

The behaviour and conduct of a country and its people are deeply influenced by its lived experiences, history, culture, and geography. China boasts of one of the most ancient civilizations in the world and has a rich culture deeply influenced by its history. The importance of culture to the people of China is amply evident from the quote above. Unsurprisingly, China's strategic culture drew a lot of attention from western scholars probing cultural insights into Chinese strategic behaviour and its likely utility in predicting future choices.

The end of the Cold War and the subsequent dramatic growth of China provides a perfect recipe for another great power competition in the Indo-Pacific. Understanding Chinese strategic choices, therefore, is not only desirable but essential to engage with China for avoiding possible miscalculations and major catastrophes. This essay aims to understand the prevalent strategic culture of China and explore its utility in identifying future strategic choices likely to be adopted by the Chinese elites.

The article is divided into four sections. The first section will explain the concept of strategic culture and analyse its evolution since its inception in the mid-20th Century. The second section identifies certain challenges and risks in application of strategic culture to the field of security studies. After exploring various features of Chinese strategic culture, the author will argue in the third section that China possesses both strands of strategic culture, viz. realpolitik parabellum and pacifist Confucian-Mencian philosophies. The last section will verify this dual aspect of Chinese strategic culture through the analysis of two prominent tenets namely '*shi*' strategy along with stability and a unified China. The author will argue that

strategic culture alone may not be the deterministic factor in identifying the strategic choices including security and use of military power, albeit playing a crucial role in identifying and discarding unlikely strategic choices.

Understanding Strategic Culture

The earliest studies of culture and its impact on behaviour can be traced to the mid-20th Century when sociologists and anthropologists probed the interdisciplinary fields of culture and political science.[2] The concept of strategic culture originated from some similar concepts developed during the Second World War such as the 'National Character,' which the USA tried to assess about Axis powers.[3] By combining the complicated noun of 'culture' with the difficult adjective of 'strategy,' the concept of strategic culture faced the herculean challenge of definitional clarity.

In his 1977 RAND Corporation report, Jack Snyder defined strategic culture in Soviet nuclear strategy as the "total of ideas, conditioned emotional responses, and patterns of habitual behaviour that members of a national strategic community have acquired through instruction or imitation and share about nuclear strategy."[4] Jack Snyder further argued that though there can be various strategic subcultures within the broader strategic culture, their fundamental outlook would be similar against an external actor (in this case the USA).[5] Many scholars agree with the fact that this report of Snyder brought "scholarly attention to the (crucial) link between political and military culture and strategic choices."[6] This is considered as the first generation work in strategic culture despite its narrow scope involving two major powers and absence of clarity on the "actual source of a state's strategic culture."[7] The second-generation work in strategic culture published in the 1980s, identified that there is a disconnect between a state's strategic culture and its behaviour.[8] Second-generation theorists such as Bradley Klein suggested that strategic culture served as a deception tool to broadcast the recognised version of a state's strategic culture while secretly practising the real operational strategic culture.[9]

The third generation of works started emerging in the 1990s and was more rigorous in academic approach.[10] However, it was Alastair Ian Johnston's seminal work, *Cultural Realism: Strategic Culture and Grand Strategy in Chinese History* that precipitated scholarly probes into the realms of strategic culture and security studies. While defining strategic

culture, Alastair Johnston agrees with Snyder's concept that strategic culture limits behavioural choices.[11] Scobell further expanded on Johnston's definition of strategic culture and identified the current purveyors of strategic culture as "(the) political and military elites and scholars."[12] After analysing the US' strategic culture, Thomas Mahnken contended that strategic culture exists at three levels: national level, military level and the military service level.[13] The fourth generation of works in strategic culture emerged in the late 2010s and its main proponents like Alan Bloomfield fielded the concept of multiple strategic sub-cultures within a state competing to gain prominence and influence the decision-making.[14] In the context of this essay, the author will adopt the following definition of strategic culture as proposed by Johnston:-

> *Strategic culture is an integrated system of symbols (i.e. argumentation structures, languages, analogies, metaphors, etc.) that acts to establish pervasive and long-lasting grand strategic preferences by formulating concepts of the role and efficacy of military force in interstate political affairs, and by clothing these conceptions with such an aura of factuality that the strategic preferences seem uniquely realistic and efficacious.*[15]

Challenges and Perils in Using Strategic Culture

The application of a strategic culture lens to the realm of international relations and security studies has numerous challenges and has drawn considerable criticism from dominant International Relations (IR) theorists such as Patrick Porter. Colin Gray cautions against 11 perils or pitfalls while undertaking cultural probes into a state's security strategies.[16] "Since all humans are encultured," Gray observed that there is nothing like "noncultural space."[17] However, culture is not the only determinant in a state's strategic choices and the strategic culture itself could evolve and modify based on the shocks experienced by the society.[18] The strategic culture needs to be read in conjunction with the temporal frame when it was formed or evolved. The temporal issue brings about the challenging arguments of continuity Vs. evolution of strategic culture.[19] Similarly, a typical challenge is identifying the institutions or people who are keepers and transmitters of strategic culture.[20] In the words of Mahnken, this is particularly applicable in the case of China as "dealing with Chinese

strategic culture involves disentangling how Chinese leaders portray themselves from how they act."[21]

Porter echoes the sentiment of many realists that "by depicting culture as the driver of military history, the culture turn notion risks being politically naïve."[22] Additionally, the cultural approach cannot explain the pragmatism and dynamism in a war that transcends across cultures.[23] Despite these challenges, strategic culture holds promise for a falsifiable explanation of the strategic choices made by a state's elites. As William Mott and Jai Chang Kim noted "instead of either culture or rational choice, a strategic cultural approach is helpful and necessary for understanding Chinese use of force."[24] The essay has so far explored the concept of strategic culture, and its scholarly evolution through four generations and identified certain challenges in its application in the field of security studies. In the next section, the author will explore some of the key aspects of Chinese strategic culture and identify its relevance in China's security strategy.

Hard realpolitik and Confucian-Mencian are two strands of Chinese strategic culture

Synthesizing Chinese Strategic Culture and its Security Strategy

In the words of Johnston, "China is a good place to start for the study of strategic culture."[25] Through his analysis of the *Seven Military Classics* and the behavioural patterns of Ming Dynasty decision-makers (1368-1644), Johnston identified two strands of Chinese strategic culture. The first one termed hard realpolitik or parabellum strategic culture, has semblance to the Western concept of realism and preferred "offensive strategies over static defensive and accommodationist options" to deal with the enemy.[26] The second strand coined by Johnston as the Confucian-Mencian strategic culture, has a pacifistic and non-expansionist view where conflict is avoidable through the "promotion of good government and the co-opting or enculturation of external threats."[27]

However, Johnston concluded that the parabellum or realpolitik strategic culture was dominant during the Ming period and the Confucian-Mencian strand remained only symbolically. Johnston also argued that the "concept of absolute flexibility [attacking and defending according to opportunity]" in the application of parabellum strategic culture facilitated Ming strategists to adopt an outright offensive posture to sometimes

defensive and accommodationist approaches, waiting for the strategic conditions to ripe.[28] Through his work, Johnston proposed that China will remain a 'cultural realist' state where grand strategic choices and behaviours are influenced by its deep-rooted strategic culture.[29] Despite its scholarly finesse and scrupulous methodology, Johnston's work was not infallible and generated a lot of debate about the rationality of his conclusions on Chinese strategic culture. Other scholars like Ghiselli and Scobell identified some of those shortcomings and further developed Johnston's work.

Ghiselli argued that Johnston's conclusions were based on certain similar behavioural patterns exhibited by the elites and his assumption that the same prevailed through millennia.[30] The lack of credible parameters to measure the continuity and failure to acknowledge the logic behind the evolution of strategic culture rendered Johnston's work deterministic. According to Ghiselli, the evolution of a state's strategic culture is dependent on how the elites selected and interpreted various cultural artefacts and their symbols which in turn would influence their behavioural patterns.[31] Ghiselli contended that "it is implausible that different people at different moments interpret the same symbol in precisely the same way."[32] The interpretation of classical strategic texts can be elusive as rulers and military commanders often use parts of these texts to their advantage.[33]

China maintains a realist view towards foreign policy and security affairs

In his analysis of texts, articles and doctrines published by the PLA and Chinese military scholars between 1992 and 2016, Ghiselli found that the Chinese strategic culture has evolved not only through revision, interpretation, and integration of old symbols, but also through the study and analysis of foreign military doctrines, especially in the field of technology.[34] While China maintains a realist view towards foreign policy and security affairs, Ghiselli noted that "Chinese strategic culture encourages quick pre-emptive operations" as part of its military options when it is adopted as the last resort.[35] Such a notion of 'offensive defence' can be compared to the 'absolute flexibility' mentioned earlier and has increasingly been considered as the evolved concept of Chinese strategic culture.

After an analysis of conflicts involving China since 1949, Scobell concluded that China essentially possesses both strands of strategic culture

as proposed by Johnston. However, Scobell argued that the parabellum and Confucian-Mencian strands are both active simultaneously and they act in a "dialectic fashion to form a (distinctive) Chinese Cult of Defence."[36] The main argument of Scobell was that while practising the 'Cult of Defence' China has shown a predisposition to the use of force in a crisis.[37]

Scobell also identified 'two faces' of Chinese Strategic culture that other scholars failed to notice. The first face is about how Chinese strategists perceive their strategy and the second one is about how they perceive the strategic culture of a foreign country.[38] According to Scobell, the Chinese strategists likened themselves to pacifist and defensive-minded people, which they have used to portray all Chinese conflicts as purely defensive in nature. This strategic culture narrative of a weak and defenceless China has also fed into the minds of the domestic audience, which provided Chinese elites with the much-required legitimacy for its military action under the garb of active defence including a pre-emptive strike. The second face of Chinese strategic culture perceives other states to be extremely aggressive and expansionist. Such a stereotypical view of other states' strategic culture fuels a consistent threat perception and suspicions in dealings with other nations, especially where the military is involved.[39] While western scholars like Johnston, Ghiselli and Scobell alluded to the underlying realist view of Chinese strategic culture, Chinese scholars like Tiejun Zhang perceive Chinese strategic culture to be predominantly pacifistic and defensive.

According to Zhang, Confucian ideology dominated traditional Chinese strategic culture where the Chinese heartland maintained tributary relations with its peripheries and adopted a non-violent approach to external aggression. While maintaining the traditional ethos of non-violence and harmony, Zhang argued that contemporary Chinese strategic culture is centred around 'defensive realism' where the use of force is justified in certain circumstances such as for the wellbeing of the people, as a purely defensive measure, and to achieve and maintain national unification.[40] However, Zhang implicitly termed military campaigns of Han Chinese regimes as 'active defence' and reflected the realpolitik or parabellum view of Chinese strategic culture as pointed out by Western scholars earlier.

In this section, the author has identified various aspects of Chinese strategic culture. It was established that the Chinese strategists like to portray their culture as being pacifistic and defensive, while they have been

practising a more pragmatic and parabellum strategic culture. The author also contended that strategic culture is not a permanent or fixed concept and has evolved to meet contemporary security challenges as is evident from the study of various scholars mentioned above. The next section will analyse the two most discernible articulations of Chinese strategic culture and ascertain their impact on China's security strategy.

Strategic Culture in Practice

In praxis, there are various tenets or articulations of Chinese strategic culture such as the concept of *shi*, stable and unified China, Active Defence, winning without fighting or deception, secrecy and stratagem, etc. However, this author will analyse the two most prominent tenets namely *shi* as well as stable and unified China in this section to verify the prominence of the realpolitik strand of Chinese strategic culture.

According to Michael Pillsbury, a renowned US diplomat and Director for Chinese Strategy at Hudson Institute, *shi* remains "at the heart of Chinese strategy."[41] Western scholars have taken arduous efforts to understand the complex concept of *shi* and its manifestation in Chinese literature and practice. *Shi* can have various connotations ranging from the propensity of things and shaping of situations to nudging or eventuating.[42] Mott and Kim argued that "Sun Tzu's insights about *shi* have influenced Chinese strategic thought and use of force."[43] Based on his analysis of French Sinologist Francois Jullien's study, Mahnken also established that the Chinese military continues to be influenced by *shi*.[44]

Shi strategy traces its origins to the earliest Confucian and Mencian principles of Tao which translates as 'right or proper way of life' or 'harmony with nature.' However, various Chinese strategists like Sun Tzu, Wu Tzu, Wei Liao Tzu, etc have developed the concept of a "coherent body of strategic thought" on statecraft and the use of force.[45] The *shi* strategy focused on people and their intent as compared to the western focus on hard power or military capabilities while formulating strategies. *Shi* strategy promotes achievement of the ultimate goal, even if it is through the circuitous route while defeating the threat (also called Li), and is considered only as means to an end. The national *shi* strategy equates to modern national interests and aims at achieving political ends rather than a military victory. *Shi* strategy at the operational level aims to attack the enemy's intent and deceive them instead of confrontation with the military forces.

The study by Mott and Kim succinctly established that despite the millennial vintage of the concept, *shi* strategy is still preserved by the Chinese strategic community and was effectively utilised in all conflicts of the 20th Century. The authors argued that the "Chinese decision to initiate war focussed on ultimate *shi* (and) not on immediate *li*.[46] The above analysis established that the Chinese *shi* strategy is influencing its offensive behaviour and is a prominent aspect of Chinese strategic culture.

Another crucial tenet of Chinese strategic culture is that of a stable and unified China. This tenet is identified by Mahnken as residing at the national level of strategic culture.[47] Scobell sees it as one of the six principles that influenced decision-making by Chinese elites in his *Cult of Defence*.[48] The Chinese hysteria for national unification and internal stability was deeply influenced by its chaotic history "marked by an ebb and flow between unity and fragmentation, centralisation and decentralisation," as noted by Mahnken.[49] The desire to achieve and maintain national unification was present throughout imperial history and the direct use of force to achieve this aim was considered righteous and justified.[50] As Scobell pointed out, the Chinese '*Cult of Defence*' considered all neighbours to be predators and inherent threats to Chinese sovereignty.[51] According to the Chinese, internal weaknesses or instability exposed the country to external aggression or intervention. Subsequently, post-independence this aspect of strategic culture influenced the Chinese Communist Party (CCP) to prioritise stability and unity of China above all and enabled the Chinese government to apply force to retain their mandate and maintain internal unity. The PLA also keeps national unity and freedom from external meddling as one of its important tasks.[52]

Internal weaknesses or instability expose a country to external aggression

The practical application of this tenet of Chinese strategic culture can be assessed by the reaction of the Chinese government to internal resentments (student protests), social movements (Falungong) and domestic ethnic minority groups (Tibetans and Uighurs). The CCP not only kept strict control over these groups and parties but also used force (Tiananmen Square) to control and suppress them. The fact that people's freedom and information including media are kept under strict control by the CCP reveals the continued hysteria of Chinese elites. Mahnken argued that this aspect of Chinese strategic culture would force Chinese scholars to "ascribe

(such) interventionist motives to outside powers" undermining China's foreign relations.[53]

The analysis of *shi*, stable and unified China tenets of Chinese strategic culture indicates that China maintains a realist worldview and is likely to have a predisposition towards realpolitik strategic culture when faced with the choice of military force. Though these tenets paint an alarmist picture, the strategic culture driving such tenets needs to be considered in the temporal and spatial context as it is not a fixed or isolated concept. The Russian invasion of Ukraine and the ongoing economic turmoil since the global pandemic are likely to have profound impacts on Chinese strategic calculus.

Chinese strategists believe that they possess a pacifist defensive strategic culture

Conclusion

This article analysed the concept of strategic culture and its evolution over the last four decades. Despite extensive scholarly attention and rigorous analysis, the field of strategic culture remains complex. The rich cultural heritage of China serves as the ideal ground for seeking insights into strategic culture-influenced decision-making. The article has also identified certain limitations and challenges in the application of strategic culture to the field of security studies.

While most Western scholars identify a realpolitik parabellum strategic culture, which encourages the use of force as and when the opportunity affords, Chinese strategists believe that they possess a pacifist defensive strategic culture. Through the analysis of various scholarly articles, this article establishes that China's strategic culture has both strands of parabellum and Confucian-Mencian strategic cultures. Though, strategic culture facilitates the identification of certain preferred strategic choices by Chinese elites based on their history and culture, strategic culture alone may not be a deterministic factor in future strategic choices of these elites. Strategic culture at best would enable in identifying and discarding of those strategic choices that the Chinese elites would not adopt for a future security challenge. It is also equally important to acknowledge that Chinese strategic culture may not be a static monolithic concept. It may evolve based on strategic shocks experienced by society, who the keepers of these strategic cultures are as well as their selection and interpretation of cultural artefacts along with their symbols, while searching for solutions to new

challenges in the future world.

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THE POLITICS OF THE CHINA-PAKISTAN ECONOMIC CORRIDOR

Captain Peter Varghese

The 'China Pakistan Economic Corridor' (CPEC), an unprecedented package of economic cooperation with its 'Iron brother' China, promised an economic boom for Pakistan. The CPEC framework agreement was signed on 05 July 2013 and formally launched with great fanfare during Chinese President Xi Jinping's visit on 20 April 2015. It proposed a massive investment of US $46 billion. The project seemed to hit the ground running and by end-2015 upgradation of the Karakoram Highway (KKH), one of the 'early harvest' projects was already complete. In November 2016, arrival of a Chinese convoy from Xinjiang was touted as the start of Gwadar Port operations.[1] In the first few years, reflective of the excitement and optimism of CPEC's initial promise, the size of planned investments kept increasing. By May 2017, the quantum of proposed investments had reached US $62 billion. The signing of a Memorandum of Understanding (MoU), for building a cascade of five dams on the Indus River, boosted the intended value of investments to US $112 billion. There was palpable excitement in Pakistan that CPEC would prove to be the much-awaited 'game-changer' and even China anointed CPEC as the 'flagship project' of the Belt and Road Initiative (BRI).

However, after a phase of rapid growth and implementation, which saw the completion of nine projects (largely energy and one for digital connectivity), CPEC saw a perceptible slowdown in project implementation starting 2017-18. This reduced activity was attributed to the infusion of some much-needed realism on CPEC's projects, differing perceptions of the Imran Khan government in Pakistan on its orientation, a profoundly changed geopolitical environment and an unseemly tussle between civilians and the Army for ownership of CPEC. CPEC is yet to recover from this reduced activity. The sharp deterioration in the security landscape of Pakistan due to resurgence of the Taliban in Pakistan and Baloch and Sindhi insurgent groups may also have contributed to China's unease in initiating or executing certain projects. Finally, the COVID-19

pandemic added to the problems of project execution.

Even nearly eight years after its launch, CPEC continues to be a major bilateral initiative between China and Pakistan though, there is little doubt that the initial enthusiasm has waned considerably and the promise of an anticipated economic revolution has been belied. Notwithstanding, CPEC continues to be largely driven by mutual animosity of the two countries towards India.[2]

CPEC is a strategically important project for both China and Pakistan in their quest for regional and global relevance as well as addressing their core economic and security concerns. The scale of investment is unprecedented. While Pakistan casts CPEC as a 'game changer' to resolve its perpetual energy crises, boost its economy, and improve transport and connectivity infrastructure; China aims to use Pakistan to fulfil its 'Chinese dream' of creating a Eurasian network centred on it. China also aims at providing stability to the troubled Xinjiang province by managing the problem of Islamic terrorism through stronger economic growth and development. Finally, the Gwadar Port project will be an important constituent of its naval ambitions centred on being a major player in the Indian Ocean. These developments in our neighbourhood are, therefore, a clear cause for concern and need a thorough understanding of its political, economic and strategic logic to strategise our responses. This article will, therefore, endeavour to examine the original motivations of China and Pakistan, the domestic and international political landscape in which CPEC developed and identify the developing fault lines.

What is the BRI?

Much has been written on the origins of the BRI; earlier known as the 'One Belt, One Road (OBOR).' Broadly, as per China's official *Visions and Actions* document, released in March 2015, the BRI consists of two main routes: the Silk Road Economic Belt (SREB) and the 21st Century Maritime Silk Road (MSR) consisting of six land corridors and two maritime routes.[3] The six land corridors include the New Eurasia Land Bridge Economic Corridor; China-Central Asia-West Asia Economic Corridor; China-Indochina Peninsula Economic Corridor; China-Mongolia-Russia Economic Corridor; China-Pakistan Economic Corridor (CPEC); and Bangladesh-China-India-Myanmar (BCIM) Economic Corridor. It is interesting that initially CPEC and BCIM were not an integral part of the

BRI but as per official documents, only 'closely related' requiring 'closer cooperation.'[4] The two maritime routes connect China's east coast with Europe and South Pacific respectively.[5] Importantly, among all the corridors, CPEC is the only one connecting China with a single country.[6]

Original Impulse for BRI. While China's official statements and documents positioned the BRI as a purely economic project for enhanced connectivity and global engagement, western critics gradually came to see it as a manifestation of Beijing's global ambitions and desire to alter the security status quo in strategically important regions like the Indian Ocean and the South China Sea.[7] One exhaustive study by Malik, *et al* from the AidData Project of the College of William and Mary, Virginia has traced 13,427 projects from 2000 to 2017. The China Global Investment Tracker (CGIT) of the American Enterprise Institute (AEI), Washington also maintains a comprehensive database on all of China's global investments since 2005 and estimates it to be about US $2.2 trillion. Based on these reports, it is clear that the original impulse for the growth of the Chinese overseas development programme was China's 'Going Out' or 'Go West' or 'Western Development' Strategy of 1999, initiated by then President Jiang Zemin.

This strategy aimed to overcome the challenges of domestic overproduction, the need to profitably invest burgeoning foreign exchange reserves and the search for natural resources deficient in China. Weak returns from US Treasury bonds after the 2008 financial crisis were another inflexion point when China ramped up its overseas development program in search of better returns. After the financial crisis, China's overseas development program tripled in one year from US $28 billion to US $98 billion in 2009. Since then it has been on a steady rise, with the announcement of the BRI making no particular difference to its trajectory (Fig 1).[8] Jeremy Garlick, a China expert, at the Jan Masaryk Institute of International Studies (IIS), Prague, after examining a wide range of official publications, media reports and scholarly texts, came to a similar conclusion that 'the Belt and Road is a continuation of previous official Chinese government policies and is merely a 'repackaging' of the previous strategy.[9] Interestingly, Jonathan Hill at the CSIS, Washington, through an analysis of 173 Chinese-funded infrastructure projects, across 45 countries along the SREB, found no correlation between the participation of a country in BRI and Chinese project activity, except in CPEC.[10]

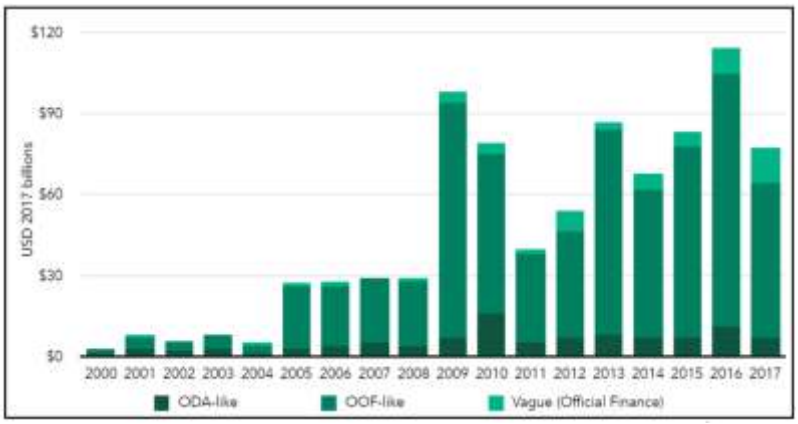

Fig 1: Official Finance Commitments of China, 2000-2017
Source: Ammar A Malik, et al, "Banking on the Belt and Road: Insights from a new global dataset of 13,427 Chinese development projects" Policy Report, AidData at William & Mary College

China-Pakistan Economic Corridor (CPEC)

Origin. CPEC was first proposed in May 2013, during the visit of Chinese Premier Li Keqiang to Pakistan, a few months before unveiling of the SREB. As per the Sino-Pakistan joint statement at that time "the two sides agreed to make efforts to combine China's western development strategy with Pakistan's domestic economic development process more closely" and "jointly study and formulate the long-term plan of the China-Pakistan Economic Corridor."[11] After several consultations under a Joint Cooperation Committee (JCC), both sides agreed to develop a 'Long-Term Plan for CPEC.'[12] The project was eventually launched on 20 April 2015 during President Xi's visit to Pakistan, after an earlier visit in November 2014 got cancelled due to demonstrations by Imran Khan's Pakistan Tehreek-e-Insaaf (PTI). CPEC's profile continued to grow with time and by the time the first Belt and Road Forum (BRF) was held in May 2017, CPEC's profile had been raised to that of a 'flagship' project.[13] By November 2017, the 'Long Term Plan for CPEC' cited it as the 'pilot' project of BRI with plans of using its experience in other countries.[14] The plan was built around a 1+4 framework with CPEC at the core and Gwadar, energy, transportation and industrial cooperation being its four pillars.[15]

Goals and Motivations. Among the six land corridors of BRI, CPEC has challenged analysts the most not only because of its size and scope, its central character but also because a robust China-Pakistan partnership,

especially in the military and nuclear domains, already existed. Accordingly, most analysts have attributed additional distinct aims to China's gigantic economic push into Pakistan. These include: -

- providing Western China access to the Arabian Sea.[16]
- development of Western China and "wean the populace from fundamentalism."[17]
- development of the Pakistani economy.[18]
- reigning in the recalcitrant East Turkistan Movement.[19]

An unstated strategic aim of China was likely to encircle India and keep it tied down in the region using Pakistan as a counterweight.[20] Pakistan, on the other hand, was convinced that CPEC was a 'game changer.'[21] Pakistan also assumed that the project would transform the country into "a regional hub and pivot for commerce and investment."[22] The motivation was clear; obtain a second line of credit and investment from China at a time when foreign investments in Pakistan had dried up.[23] It was also a means to make the China-Pakistan relationship more broad-based, which up until then had military and security relations at its core.[24] Interestingly, analysts have commented on how CPEC was an attempt by then Prime Minister Nawaz Sharif to "tilt the balance a little further in favour of the country's politicians running the economy."

Internal Politics

While there was euphoria in the initial days, it also opened up political fault lines. Criticism soon started piling up due to allegations of inflated project costs; political favouritism; unfavourable terms and conditions; and overall opacity in project details. Descriptions of this fault line have been captured well in Arif Rafiq's *CPEC: Barriers and Impact*.[25] Andrew Small's excellent analysis in *Returning to the Shadows* also shares a similar thought process.[26] These concerns range from lack of transparency in project selection; fears among smaller provinces of being left out from this 'national' project; political 'mistrust' between parties; lack of consultation in the selection of the 'route;' inclusion of a 'municipal' project like the Orange Metro Line at Lahore in this 'national' endeavour; and finally the ever troubling issue of Baloch alienation fuelled by fears of resource exploitation and lack of equity. Some politicians even said that the 'P' in CPEC stood for Punjab.[27] At the same time, others accused it of becoming another 'East India Company.'[28] Andrew Small highlighted other problems,

including concerns amongst the Pakistani business community against preferential terms being offered to China, influx of Chinese workers, exploitation of local women by Chinese human-trafficking networks, growing militant attacks and finally economic concerns of Pakistan falling into a Chinese 'debt-trap.'

This criticism unsettled China and it came out strongly against this negative portrayal.[29] Abdur Rehman Shah writing in *The Diplomat* attributed China's discomfiture to the clash of two distinct political systems, one where decision-making was centralized (in China) and another where provincial governments had important roles. Since then, China has been actively trying to dispel negative accounts in Pakistan: -

- through seminars.[30]
- meetings with politicians.[31]
- organizing visits to China and has also formed a 'Political Parties Forum of Pakistan and China on CPEC' for building consensus.[32]

Yet another fault line emerged between political parties on one hand and Pakistan Army on the other. While Nawaz Sharif was keen that CPEC remained in civilian hands, Pakistan Army, which saw itself as a natural stakeholder and final arbiter of the country's foreign and security policies, wanted more say.[33] It was also keen that the project remained non-controversial so as not to destabilize its deep military cooperation with China.[34] Despite being happy with PML-N's (Pakistan Muslim League-Nawaz) 'Punjab Speed,' China was not averse to deeper military involvement in CPEC.[35] In late 2015, the Army even proposed a CPEC board as an apex policy-making and coordination body. However, then Prime Minister Nawaz Sharif refused. Then in an 'undisclosed' meeting, now known as the infamous 'Dawn Leaks' case, the government warned the Army of growing international pressure and asked it to change the way it deals with Islamic terrorists. The Pakistani Foreign Secretary brought out that even China had indicated a preference for a change in course by Pakistan.[36] This was among other tensions that finally contributed to the ouster of PML-N in an engineered election in 2018.

Pakistan Tehreek-e-Insaaf (PTI) and CPEC

While much of domestic opposition from multiple quarters was successfully managed and a national consensus towards the project orchestrated, one of the biggest challenges for CPEC arose in the form of

Imran Khan and his PTI party. Earlier, during the 'route' controversy, Imran Khan's PTI Chief Minister from Khyber Pakhtunkhwa (KP) had warned the Federal government it would not allow CPEC to pass through KP if the Western route were not part of it.[37] Viewing CPEC as PML-N's pet project, PTI came out strongly against CPEC's lack of transparency and corruption during its election campaign in 2018. After coming to power, controversies continued to fester with the regular raising of demands for renegotiation of CPEC terms and even calls for a pause in investments to handle repayment issues.[38] Charges of the Chinese offering bribes to PML-N were also levelled much to the chagrin of China which claimed to be following a zero-tolerance policy on corruption back home.[39] Further, the PTI government's unilateral suggestion to include Saudi Arabia in the project also troubled the Chinese who viewed CPEC as an exclusively bilateral project.[40]

Charges of the Chinese offering bribes to PML-N were levelled

Pakistan then went on to take the unilateral decision to reduce the cost of the Main Line-1 (ML-1) railway project by US $2 billion.[41] Although unhappy with the Army's role in bringing Imran Khan to power, China fell back on its 'most trusted partner' to rein in Imran Khan and bring back some balance to the relationship. It took a visit to China in September 2018 by Pakistan's Army Chief to soothe Chinese nerves.[42] However, to China's credit, it took a conciliatory stance and agreed to some minor shifts from large infrastructure projects to more sustainable cooperation in industrial, agricultural and socio-economic sectors and science and technology in time to build a "respectable public narrative around CPEC in place for the 2nd BRF," which was due in April 2019.[43] It even agreed to provide a US $1 billion grant to fund the socio-economic projects.[44] Finally, to prevent further derailing, the Army had to step in and take direct control through setting up of the CPEC Authority under a retired General.[45]

External Politics and Geopolitical Pressures

Even as things with China were heating up, trouble started brewing in another quarter. China and the BRI came under a frontal attack from the USA. In a review of its National Security Strategy (NSS), President Trump announced the 'return of great power competition' in 2017 in which he identified Russia and China as 'competitors.'[46] By then, President Trump had fired his first salvo in the ensuing 'trade war' with China, imposing

restrictions on imports of Chinese solar panels.[47] Pressure on Pakistan increased after a review of the USA's Af-Pak (Afghanistan-Pakistan) strategy in late 2017.[48] In June 2018, Pakistan found itself on the 'grey list' of the global financial watch body, the Financial Action Task Force (FATF).[49] US senators also started expressing concerns over requests for bailouts from the International Monetary Front (IMF) from countries which had accepted 'predatory' Chinese financing.[50] In October 2018, Secretary of State Pompeo accused China of building an empire by bribing leaders with investments and vowed to fight it.[51] He warned IMF against using its money to repay Chinese loans.[52] Accusations of 'debt-trap diplomacy' also started surfacing more frequently against China.[53] It was only after a crucial role in facilitating talks with the Taliban that formal talks with the IMF commenced and by July 2019, IMF approved a three-year, US $6 billion, package for Pakistan releasing some pressure.[54] Finally, after the USA released its 'Free and Open Indo-Pacific (FOIP) Strategy' in November 2019, Ambassador Alice Wells, the Principal Deputy Assistant Secretary of State for South and Central Asia, made a frontal attack on CPEC, in what some called 'the speech heard round the world,' calling it expensive and unsustainable.[55] This once again hit Pakistan hard as by now it was used to a more benign attitude of the US on CPEC.[56]

Increased security risks opened up fault lines between Pakistan Army and China

CPEC- In Summary

Domestically, the analysis of events brings out a few things. First, left to civilians and politicians, the internal debate on CPEC was quite vibrant. However, as the debate became more acrimonious, the Army had to step in creating a further imbalance among parties and with the Army. Secondly, China's discomfort with heated debates and political criticism led to a 'please-all' policy and the inclusion of unviable projects in the CPEC portfolio on the whims of the PML-N. Thirdly, the involvement of the Army led to over-securitisation of CPEC and a heavy-handed approach leading to alienation of already marginalized communities, like the Baloch, leading to increased security threats. Increased security risks then opened up fault lines between the Army and China.

Internationally, it is clear that the shift in geopolitical circumstances changed the fate of CPEC. The USA used its financial and political clout to

pressurise Pakistan to do its bidding; first in Afghanistan and then to checkmate China's BRI. CPEC is in the cross-hairs of the growing US-China 'great power' rivalry. This prickly geo-political climate is likely to continue making it difficult for Pakistan to balance between the two. It is also clear that without this pressure, China would have a much larger say in Pakistani affairs.

Pakistan Fault Lines

While many feel CPEC has strengthened the bonds of mutual friendship, the article brings out that it has increased friction between various stakeholders within Pakistan and also between China and Pakistan.

Mistrust Among Political Parties. CPEC has increasingly become political in Pakistan. Though Nawaz Sharif was quick to embrace CPEC, it was first proposed by Asif Ali Zardari (leader of the PPP) which, even China accepts.[57] The association with PML-N also led Imran Khan to cold shoulder CPEC when he came to power. Unequal project distribution, the disparity in the allocation of funds and allegations of personal benefits drew criticisms from other political parties too. China, which was comfortably navigating its relations with Pakistan from behind the scenes, then had to get its hands dirty in Pakistani politics. The Pakistan Army too has had to expend a lot of energy in keeping parties under control and preventing public criticism of CPEC. Any weakening of Army control on the political discourse on CPEC would crack this fault line leading to further politicisation making China a convenient target for Pakistan's failings.

Angst Among Local Businessmen. The plethora of concessions and exemptions offered to the Chinese has led to complaints and criticisms among local businessmen who protest against not being provided similar terms. On the other hand, Chinese investors refuse to invest or do business without these sops. Lucrative rates of return, special concessions, exemptions from taxes and waiver of duties on imported items are some of the advantages that Chinese investors get. With the 'next Phase' of CPEC-induced 'industrial cooperation' set to commence, this fault line is likely to widen.

Friction in Civil-Military Relations. CPEC has become one more reason for increased civil-military tensions. While the Army considers itself as the natural and primary stakeholder in formulating Pakistan's security and foreign policies, absence of a direct stake in this large external economic

program was a cause for concern for the Army, especially since it involved the politically sensitive regions of so-called Gilgit-Baltistan and Baluchistan. The thwarting of efforts by politicians created major friction with the Army, especially with PML-N. On the other hand, even after gaining a direct role, the failures of CPEC are being attributed by the Army to mismanagement by politicians and bureaucrats.[58] Considering CPEC's problems are multifaceted, this friction will continue.

Provincial Apathy. Despite being a 'national' project, political mistrust, ensures that not all provinces are on board, especially Baluchistan, Khyber-Pakhtunkhwa and so-called Gilgit-Baltistan and Pakistan-Occupied Jammu and Kashmir. With significant legislative and administrative powers shifting to provinces after the 18th Amendment, this problem has become even more acute. Progress on projects then gets bogged down due to non-prioritisation by provincial governments, pressures from local interest groups and bureaucratic apathy. Without a reformed political system, this fault line will continue to stall CPEC's progress.

The Chinese Fault Line

Differing Motives for Project Selection. An interesting aspect of CPEC is that most of the projects selected for CPEC were proposed by Pakistan with China focusing only on select 'strategic' projects, such as Gwadar; the Optical Fibre Cable; the Main Line-1 railway line; and the upgradation of the Karakoram Highway to maintain connectivity with Pakistan. One of the main motivators for Pakistan was the prospect of earning revenue through tolls and goods transiting using the 'corridor.' Pakistan also had expectations of a large number of China-sponsored projects. However, Pakistan ended up spending a lot of its own money on realising the 'corridor' and being laden with heavy Chinese loans.[59] With no easy money coming from China, unlike from Paris Club members, this is a fault line China is navigating carefully. Pakistan's reluctance to go ahead with the Main Line-1 upgrades on current terms is proof of Pakistan now drawing clear lines. This has become another reason for friction between China and Pakistan.

Debt-trap. This has been one of the biggest concerns of Pakistan and a constant source of criticism from both international and domestic opinion makers. Although many studies bring out that CPEC *per se* is not the major contributor to Pakistan's debt; associated implicit guarantees, concessions

and exemptions provided to Chinese companies were significant. US information operations through its army of think tanks and analysts on BRI debt distress, keep Pakistan on the back foot about its CPEC commitments. Pressure from the IMF and constant threat of downgrading by credit rating agencies also leads to Pakistani dismay. The worsening of Pakistani economy, all of which is not the result of Chinese involvement adds to criticism of CPEC and the demand from China to constantly defend the 'corridor' creating another fault line.

Friction between Pakistan Army and China. The military-to-military ties between China and Pakistan have long been the bedrock of their relationship. However, the political acrimony created due to CPEC did threaten to derail it with China putting pressure on the Army to rein in political parties. Its subsequent role in propping up Imran Khan, a known critic of CPEC, also put strains on the Army's relationship with China. To assuage China's disappointment, the Army pushed through creation of the CPEC Authority, a long-time Chinese demand, but corruption charges against its first Chairman, a retired General, muddied waters. Pakistan Army will likely continue to be called upon by China to progress things. This will only make their relationship more complicated.

Pakistan Army will likely continue to be called upon by China to progress things

Alienation of Local Populations. Development through CPEC was meant to have ameliorated concerns of neglected communities and helped mainstream them. Instead, exploitative terms and conditions and the opaque nature of CPEC agreements and contracts culminated in further alienation of local people, especially in Baluchistan and so-called Gilgit-Baltistan (in PoJK), who already bear grudges against the Pakistani State.[60] These have substantially increased threats to Chinese workers and CPEC projects from growing militancy and insurgent groups. The resultant militarization of Gwadar has further increased criticism of the Chinese among locals and is unlikely to abate any time soon.

Security of Chinese Workers. The inability of the Army to provide security to Chinese workers and CPEC projects has been a constant point of friction between the Pakistan Army and China. A JWG to discuss issues related to security was set up to coordinate issues with a China Military Commission (CMC) member visiting Pakistan for talks. Almost all joint statements and press releases between the two countries regularly

emphasize the need for better security. Spawning of religious terrorist groups in the ungoverned spaces of Pakistan and Afghanistan under the permissive policies of the Pakistan Army has also been a constant source of angst since these groups in turn have links with Uighur militants of Xinjiang.

The US Fault Line

Great Power Rivalry. Pakistan is being buffeted by the emerging US-China great power rivalry. While in the initial stages, USA was ambivalent towards CPEC, after it rolled out its NSS and FOIP strategies, it has come out clearly against the initiative. It has warned Pakistan against pursuing unsustainable projects based on heavy loans. Though China is Pakistan's biggest trade partner, major defence supplier and strategic ally, the USA remains its largest export destination and a crucial foreign exchange earner. Pakistan has to balance between the two countries, their rivalries and their propaganda machines. With a growing US-China rivalry, Pakistan and CPEC will continue to fall under its crosshairs.

With growing US-China rivalry, Pakistan and CPEC will continue to fall under US crosshairs

US Political Pressure. USA has a large say in the IMF and other global multilateral bodies such as the FATF. This gives it huge political leverage over Pakistan due to its perennial dependence on the West for cheap loans and access to commercial borrowing markets. There have been allegations that America used this leverage to initiate US-Taliban talks at Doha, Qatar in 2018-19 while also using its clout in other institutions like the FATF to build political pressure and seek cooperation in Afghanistan. Credit rating agencies also base many of their ratings on Pakistan remaining under an IMF programme. In case Pakistan continues to pursue CPEC and prioritise its relations with China, it would fall foul of US policies and face significant political and financial pressure.

The present geo strategical space and economics around the CPEC remains murky, non-transparent and uncertain. This puts the entire region into a state of unequilibrium and instability, with Pakistan and China having a lot to answer for. Watch this space!

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INDIAN NAVAL SATELLITE COMMUNICATION CHALLENGES AND WAY AHEAD

Lieutenant Commander Deepak Tiwari

Introduction

The tryst of the Indian Navy (*IN*) with a dedicated Defence Communication Satellite began on 30 August 13 with the successful launch of GSAT-7 by the Indian Space Research Organisation (ISRO) from French Guiana under Project *Rukmani*.[1] With this landmark event, the *IN* joined an elite group of Navies that possessed the capability to conduct operations using dedicated communication satellites.

The reach of GSAT-7 has profoundly impacted the tempo of naval operations. *Rukmani* provides a multi-band (Satellite Communication) SATCOM capability on UHF, S, C and Ku bands for the surface, sub-surface and air assets of the *IN*. With this capability, near real-time communication is feasible over voice, video and data applications along the maritime Indian footprint spanning almost the entire Indian Ocean Region (IOR) to effectively meet strategic communication needs.

Whilst Project *Rukmani* heralded *IN* into a new era of indigenous SATCOM communications, the prognosis is that there are numerous newer and disruptive technologies still to be developed in terms of space-based satellite communications systems, with more powerful processors, new encoding capabilities, and new user terminal capabilities. These can make user systems more mobile, versatile, responsive and powerful in terms of performance while simultaneously lowering costs.[2]

Requirements

Commercial Satellites for Military Purposes. The militarization of space has become a known fact today with a proliferation of dedicated military satellites in use. Their usage generally encompasses Command and Control of strategic forces, secure voice communication, wideband and high capacity communications in support of the intelligence community, headquarters, the National Command Authority and beyond-the-horizon

communication between mobile forces and their varied components. Many countries exploit their commercial satellites for some, or all, of their telecommunications and broadcasting needs. In addition to the USA and Russia, organizations such as NATO utilise both military and commercial satellites for military purposes.[3]

Network Centric Operations. *IN* is a multi-faceted force with diverse elements spread across the surface, sub-surface, air, intelligence, unmanned, space and cyber domains. A Network-Centric capability, therefore, becomes an undisputable backbone of *IN* operations. With a need for communication to percolate to the lowest echelons, the first imperative is to increase the reach of SATCOM, and not be restricted to only certain platforms. It needs to be available with every element and unit across the three Services. Lessons from various exercises indicate that seamless communication among various stakeholders during joint operations/ exercises such as amphibious operations poses a serious challenge to command, control and coordination. Last mile connectivity, which includes ground/landing forces/special forces on remote islands where each soldier is netted in through SATCOM will be a force multiplier for such operations and coordination with units at sea through satellite phones are a critical necessity.

Interoperability with Sister Services and Foreign Navies. With the integration of the Services (Army, Navy and Air Force) for joint operations gaining momentum, the need for SATCOM requirements deserves impetus. Interoperability at various levels - be it with Para-military forces (territorial/coastal exercises) or sister Services of armed forces (joint exercises) or foreign navies (multi-national exercises) - can be augmented greatly with SATCOM as the backbone. The instances of operating with disaster relief forces like NDRF during floods in Kerala (in the year 2018), wherein, the Southern Naval Command was steering rescue operations proved a great challenge due to lack of communication with the forward deployed rescue teams. Satellite phones at the tactical level were the need of the hour then, even now and will be so in future. Our future SATCOM should, therefore, be of global standards and common to all security forces and government agencies of the country.[3] Further, the *IN* regularly operates and exercises with foreign navies as a Preferred Security Provider in the IOR and beyond. The use of SATCOM will provide a convenient, speedy and easy-to-use communication means to overcome any last-minute

challenges requiring apex or tactical-level intervention.

Unmanned Technology. UAV uplinks and downlinks, streaming video, high-definition imagery and weapon systems, which are increasingly dependent on significant quantities of data, are the new norms. A case in point is the induction of the Sea Guardian (MQ 9B Reaper) with an endurance of more than 40 hours, which has enhanced the Intelligence Surveillance Reconnaissance (ISR) and Battle Damage Assessment (BDA) capabilities of the *IN*. Unmanned technology being acquired in the form of UAVs, drones, etc. will also pose a mandatory requirement for higher bandwidths.

SATCOM on the Move. Seamless coordination has emerged as a challenge in multi-agency exercises like *Kavach*, which include a number of stakeholders viz. *IN*, Coast Guard, Ministry of Home Affairs, Ministry of Fisheries and the Ministry of Shipping. It has been observed during these exercises that seamless coordination was a challenge. The actors involved were spatially dispersed along the Indian coast as well as in government offices. Coordinating and controlling all these organisations, including the smallest unit in the remotest area as part of the action grid, required hassle-free, 24x7 communication. Keeping the myriad operation centres all across the country updated with developing situations in real time is quintessential. Rapid speed and connectivity has become need of the hour in order to update all stakeholders with a continuous and uninterrupted flow of information from multiple nodes and to support decision-making at higher levels. These can be achieved through Satellite on the Move (SOM) terminals. The increased importance of mobile communication in diverse conditions and with low-power terminals along the coastline for coordinated operations is a critical requirement that can be met with a cohesive and inclusive SATCOM policy.

Challenges

Decisive Planning. After looking at the varied requirements of SATCOM by the *IN* and other maritime security agencies, the challenge now lies in making the best use of commercial and military satellites depending on the operation and actors involved. For internal operations with internal actors, commercial SATCOM may prove to be a better option provided the nature of operations is not compromised. The accessibility to SATCOM by civil actors and better services due to competition among commercial firms etc.

will facilitate smoother command, control and coordination of such operations.

Security. The idea of the military using commercial satellite technology raises questions about security, control and coverage, and costs. In many ways, today's satellites are digital processors in the sky and specialized software defines how they perform and defines their communication capabilities. When it comes to security concerns, new waveforms and advanced modems with certified and enhanced military security protocols can be incorporated into existing terminals to deter attack or interference.[4] Issues of security can be addressed with these improved modems and network management tools.

Envisaged Bandwidth Requirements

Communication Band. Satellite Communication is based on a specific range of frequencies. For maritime SATCOM, frequencies from 1Ghz to 30

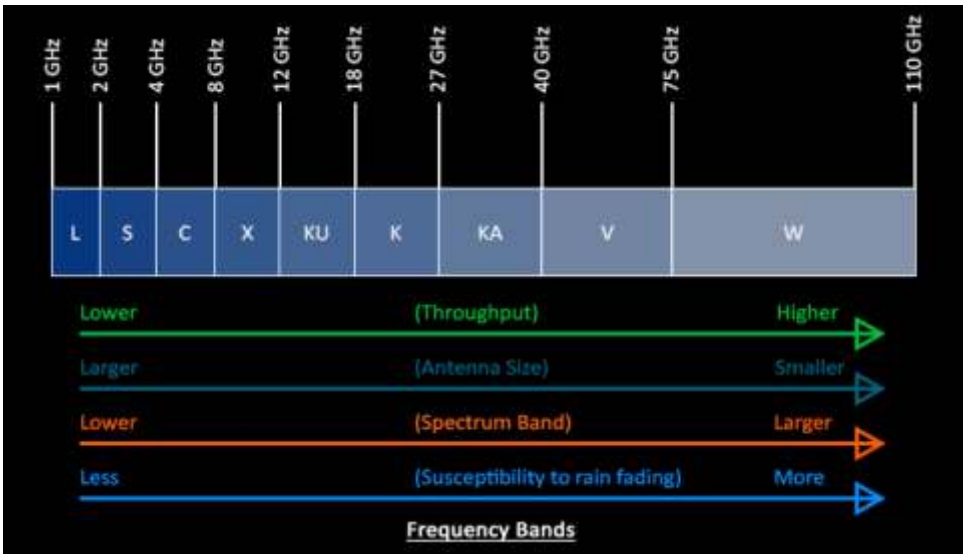

Fig 1: Satellite Communication Bands as per the Old Frequency Nomenclature[5]

Ghz (L, C, X, Ku and Ka bands as per the old nomenclature system) are being used (Fig 1). Though the services offered by Project *Rukmani* encompass most of these bands, optimum exploitation with uninterrupted services, especially when higher bandwidths are required, is seldom achieved. Some of the unutilised bands for SATCOM include X and V. Although the C band is better resistant to rain fade, the X band can also be

explored to avail additional bandwidth at lower capacities.

C and Ku Band. The primary exploited bands of *Rukmani* include C and Ku onboard surface platforms. However, at present, the applications are being exploited at meagre rates. To meet demand for seamless communications, the minimum bandwidth envisaged includes 1-3 Mbps for Voice, 3-5 Mbps for Data (catering for sharing of high-quality photos and video clips) and 5-25 Mbps for Video (catering for HD streaming/ multi-node video conferencing etc.). Another important factor to cater for optimisation of SATCOM bandwidth is the management of Internet Protocol (IP) infrastructure, which has huge technical implications. Implementation of the latest networking tools will have a huge impact on the optimisation of available bandwidths.

Higher frequency bands give access to wider bandwidths and signal degradation

UHF SATCOM. The exploitation of UHF SATCOM has been restricted subject to the limited number of available links. Currently, GSAT 7 carries UHF x C, C x UHF and limited UHF x UHF transponders. The UHF transceiver operates in Demand Assigned Multiple Access (DAMA) and Permanent Assigned Multiple Access (PAMA) configurations. Increasing the number of UHF x UHF transponders and utilising better network access configurations instead of DAMA and PAMA would enhance the optimisation of UHF SATCOM bandwidth. Higher frequency bands typically give access to wider bandwidths but are also more susceptible to signal degradation due to 'rain fade' (the absorption of radio signals by atmospheric rain, snow or ice). Congestion has become a serious issue in the lower frequency bands because of satellites' increased use, number and size. Newer technologies are being developed by commercial manufacturers so that higher bands can be used.[6]

High Throughput Satellites (HTS). Considered to be the latest development in maritime SATCOM, HTS services will soon become available on Ku and Ka bands. A high throughput Satellite reuses the same frequency over multiple beams within its coverage area or footprint. This implies that it can offer more bandwidth with the control that's needed to deliver it. Traditional VSAT satellites use a single beam over the entire footprint and the bandwidth capabilities therein are limited. HTS services will introduce a significant amount of new satellite throughput capacity for maritime users. The technology may be considered for naval operations too.

The advent of HTS and the proliferation of smaller satellites in Low Earth Orbit (LEO) and Medium Earth Orbit (MEO) are set to impact every domain of the telecommunications sector. It is believed that in the future majority of traffic will be over LEO satellites using the HTS concept.

SATCOM Constellation - Geostationary Equatorial Orbit (GEO) Vs MEO Vs LEO

GSAT 7/GSAT 7R. While GSAT-7 and GSAT-7R are both geostationary satellites, GSAT-7R has greater bandwidth and transponder capacity. Since they are stationary with respect to Earth, they are more vulnerable to attack. Satellites in LEO constantly keep moving and provide a lesser propensity for being attacked with anti-satellite weapons. Across the globe, the launching of more satellites in LEO is gaining importance as they are more affordable and provide extensive services due to increasing competition between service providers. Firms such as *One Web* and *Spacex* are launching large constellations of LEO communication satellites with a data transfer capacity of terabytes per second.[7]

LEO satellites need a large number of satellites to cover a specific geographical area

LEO Vs GEO Constellation. LEO and GEO/Geosynchronous Orbit (GS0) satellites are the two extremes when it comes to altitude. LEO satellites are small and their orbits are close to the Earth. So, the rockets needed to launch them are also smaller and cheaper. The disadvantage of LEO satellites is that a large number of satellites are needed to cover any specific geographical area. LEO satellites orbit the Earth many times per day. As each satellite flies over the coverage area, another one must follow behind it, ready to take over the communication, once the first satellite has passed. This also adds to the network complexity as many ground stations are needed to communicate with all these satellites. They also need to use different frequencies to avoid interfering with each other's communication. Compare this with a GEO satellite, which is stationary above the area that needs coverage and will stay there. While GEO satellites are bigger and more expensive to deploy, the network operator can gradually add to their coverage as the network grows. This holds true, especially for the *IN* as new technology is embraced in the operational domain in conjunction with sister services.

MEO Constellation. MEO satellites are commonly used for geographical

positioning information like GPS, GLONASS and Galileo. GPS satellites generally have an altitude of about 22,000 km, which gives them an orbital period of 12 hours. If one compares this to Global Star's altitude of 1,414 km, it is evident that much more fuel is needed to propel a satellite that far. The satellite will also need to be bigger to transmit a stronger signal, and the communication latency will be higher. These are some trade-offs that therefore have to be considered when designing a constellation.[8]

Considering the present requirement of *IN* operations, GEO satellites are more conducive, but optimisation of bandwidths for satellite communication needs more focus. The future roadmap of *IN* SATCOM could progress on developing the GEO constellation with the incorporation of the latest technologies and network management tools. However, leveraging the benefits of LEO constellation satellites, through stringent military protocols, for the exploitation of commercial satellite communication still remains a viable option. This can help meet the near future demands of operations involving higher bandwidths and better capacity for satellite communication. While the GEO constellation could form the primary SATCOM, the exploration of utilising commercial LEO constellations for redundancy during wartime contingencies can be considered as a backup plan. Additionally, the possibility of merging military payloads with commercial satellites under stringent military protocols can also be considered.

Recommendations

SATCOM is undoubtedly the future of wireless communication. It is evident from the fact that global companies like OneWeb, GlobalStar, 03B *et al* are investing extensively in LEO and MEO-based SATCOM.[9] Most countries of the world are already exploiting commercial satellites for military purposes. The increasing demand for bandwidth and excessive competition among global players to race ahead in SATCOM would pose a greater challenge for the operation of exclusive military satellites. In addition, alternatives to exploit commercial satellites for military purposes are growing with time.[10] The use of Starlink in the ongoing Russia-Ukraine conflict is an apt example of the same.

Considering aspects of technological development and optimal exploitation of SATCOM for real-time strategic communication, the roadmap of *IN* SATCOM could include the following: -

- Investing more in GEO constellations with robust IT infrastructure. As a lesser number of satellites would cover the entire area of operations and interest, it could be feasible to incorporate more additions to the network to keep pace with growing demands.
- Establishing a protocol for merging military applications with commercial technology, especially to exploit features of high capacity (terabytes per second) of LEO constellations for ISR, Disaster Relief, Carrier Operations, etc.
- Undertake Research and Development towards using military payloads in conjunction with commercial satellites and development of new waveforms.
- A suitable replacement for UHF SATCOM for better utilisation of the UHF band. In this regard, the management of IP infrastructure too could be explored for optimisation of bandwidth usage. This would enable increased bandwidth of C and Ku bands to support 1-3 Mbps for voice, 3-5 Mbps for data and 5-25 Mbps for video.
- Inclusion of the HTS system in the future roadmap of *IN* SATCOM.

Conclusion

Satellite Communication technology has achieved remarkable efficiency and increase in performance in the last five decades. These developments have occurred in parallel with significant advancements in IT and telecommunications systems that include Artificial Intelligence (Al), Machine Learning (ML), Cloud computing, etc.[11]

As national economies become increasingly global with the infusion of human enterprise, the need for effective wireless interconnection via satellite communications will expand exponentially. As brought out earlier, the increased utilisation of space systems of manned, unmanned and planetary bodies will require improved space communication systems. It is a fact that technology experiences exponential advancements driven by innovations. But the other drivers of change for SATCOM could *inter alia*, include the following: -

- New service demands in both civilian and defence-related markets.
- Restructuring of commercial satellite organizations through acquisition, merger and regulatory changes.
- Allocation and reallocation of frequencies.
- Convergence between various satellite applications markets - in

terms of technology as well as structural integration.

- Constraints in orbital configurations and orbital debris.[12]
- Increased human activities in outer space could prove to be a significant shaper of growth in satellite systems over the next 20-30 years.

The *IN* is well placed to leverage the unending transformations in SATCOM, enhancing its C4ISR capabilities to protect its maritime interests and preserve a 'Rules Based Order' in its Areas of Interest.

Lt Cdr Deepak Tiwari is an alumnus of the Indian Naval Academy, Ezhimala and was commissioned into the Indian Navy in 2015. He is a Communication and Electronic Warfare specialist and has tenanted several appointments afloat and ashore to optimally utilise his expertise.

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CHALLENGES AND OPPORTUNITIES IN THE CENTRAL ASIAN REGION

Rear Admiral C Raghuram

Introduction

This paper would be studying India's relationship with the five nations of the Central Asian Region (CAR) viz. Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan and Uzbekistan. From mid-19th century until almost the end of the 20th Century, most of Central Asia was part of the Russian Empire and later the Soviet Union. The residents of these nations include 7 million ethnic Russians, 500,000 Ukrainians 300,000 Koreans and 170,000 ethnic Germans. The region has a population of about 72 million (2019) - Kazakhstan (18 million), Kyrgyzstan (6 million), Tajikistan (9 million), Turkmenistan (6 million), and Uzbekistan (33 million).[1]

India's link to this region dates back to more than 2,500 years through trade routes connecting the Gangetic plains and the Southern Eurasian Continent, known as Uttatapatha.[2] The strategic location of the South Central Asian Region made it an essential conduit for the diffusion of trade, religion, philosophy and science across Asia and Europe. This region was also exploited by the Greeks, Turks and Mughals as a staging area for invasions into India. Until the end of the Cold War, India enjoyed strong strategic support within the region under the umbrella of the Indo-USSR Treaty of Friendship, Peace and Cooperation of 1971.[3] However, the collapse of the Warsaw Pact in 1990 resulted in dissolution of the erstwhile USSR, which changed the geopolitical landscape and diminished the strategic support of India in the region.

Today, the nascent energy-rich region is under transformation with various nations across the globe closely monitoring and investing in the region. 'Great Power Rivalry' has increased manifold. In the ongoing geostrategic power play, major stakeholders in the region are Russia, China, India, USA, European Union, Iran, Afghanistan and Pakistan. The region spread over 4 million sq. km, is landlocked, resulting in poor regional connectivity.[4] The region is rich in energy and mineral resources, but its

poor connectivity makes it over-dependent on China and Russia due to its geographical continuity with these nations. China's Belt and Road Initiative passing through the CAR envisages an investment of US $40 Billion.[5] The region also faces challenges emerging from authoritarian regimes and religious extremism.

India is also re-aligning and enhancing its strategic presence in CAR. In the year 2015, Shri Narendra Modi, India's Prime Minister made a visit to the region covering all five nations and paving the way for deep and close cooperation in the fields of education, energy, defence, science and technology.[6] While the region has several existing defence production lines, they need heavy investment to rejuvenate.

For optimal international economic and political engagement, the major impediment is terrain which has extremes - mountainous landscape, impassable deserts, and semi-deserts.[7] Political processes in these countries were subjected to geopolitical competition after disintegration of the Soviet Union. China used economic levers to achieve a gradual increase in its presence in Central Asia. In recent years, the political processes in these countries have evolved, however, this evolution is in the backdrop of power institutions and party systems defined with the dominance of tribal and regional-clan interests.[8]

This region is rich in oil, gas, gold, copper, aluminium, uranium, etc. According to the World Bank, oil, and gas exports in countries of this region varies from 30 to 40% of the total volume, and the benefit from sale of these hydrocarbons forms a significant portion of budget income to provide resources for investment and development. The forecast for GDP growth for 2021 is as indicated at Table 1: -

Country	**GDP (Billions of US $) (2017)**	**GDP per capita (2017)**	**Growth Forecast for 2021 (in %)**	**Major Economic Contributors in % (Agriculture/ Industry/ Services)**
Kazakhstan	$ 477.6	$8,841	3.2 %	4.7/ 34.1/ 61.2
Uzbekistan	$ 222.8	$1,491	4.0 %	25.9/ 13.2/ 60.9
Turkmenistan	$ 104.0	$ 6643	4.8 %	7.5/ 44.9/ 47.7
Tajikistan	$ 27.80	$ 824	5 %	23.4/ 28.6/ 48
Kyrgyzstan	$ 22.74	$1,144	3.5 %	12.09/ 27.61/ 50.24

Table 1: GDP Growth Forecast[9]

Education, Science and Technology

Many of the research institutions established by the erstwhile USSR in this region have since become dated, unable to keep pace with technological advances as well as rapidly evolving national priorities. This has led each nation to optimally merge, shut down or alter the mandate of each institution. Some of these changes are enumerated below: -

- Merger of many Turkmen Academy of Sciences
- Reorganisation of Academy of Sciences of Uzbekistan
- Building technology parks in Kazakhstan and Turkmenistan
- Creation of technology parks with research, education, industrial facilities, business incubators and exhibition centres in Turkmenistan

The researcher density (researchers per million population) of Kazakhstan and Uzbekistan is close to the world average.[10]

Energy - Present and Future

CAR is rich in energy, attracting powerful nations such as Russia and China to establish and build strategic ties. The availability of energy sources in India vis-à-vis CAR and the Middle East are given in Table 2 below: -

Oil (thousand million barrels)				
	Production	**Consumption**	**Balance**	**Reserve**
CAR	.84	.24	+ .60	31.5
Middle East	11.07	3.44	+7.57	838
India	.30	1.9	- 1.6	4.7
World	35.87	35.11	-	1734
Natural Gas (thousand million cubic meters)				
CAR	143.2	98.3	44.9	23400
Middle East	695.3	558.4	+ 136.9	75600
India	26.9	59.7	- 32.8	1300
World	3989.3	3929.2	-	198800

Table 2: Availability of Energy Sources[11]

India as the 3rd largest energy consumer in the world needs assured

continuous and diversified energy supply, which is critical for its economic growth. Coal continues to be the main source of energy at 45%, followed by oil at 26%, biomass at 20% and natural gas at 6%. To meet emission norms and enhance clean and green energy, India plans to more than double its natural gas consumption to 15 % by the year 2030.[12] Till recently, the Middle East supplied approximately 60% of India's crude oil demand with Iraq's share at 24%. However, the Iran supply fell to zero due to US sanctions in 2019. Exports from the Americas (Venezuela) and Africa face frequent disruptions. Similarly, Qatar supplies 41% of the total natural gas demand of India. There is also a need to diversify India's energy basket by boosting gas, renewable and nuclear sources of energy. The gap between supply and demand for energy from now till 2047 is ever-increasing in India and there is a need to enhance reserve stock and diversify the sources of procurement so that India is secure on the energy front.[13]

CAR is home to an estimated 4% of natural gas, 3% of oil reserves and over 200 high-quality coal fields. Kazakhstan holds 38% of the world's Uranium reserves.[14] In keeping with the end state of diversifying energy sources, Indian companies have acquired energy stakes in the region. However, the issue of transportation of these resources remains a Gordian knot for India. Notwithstanding, in order to enhance the proportional ratio of natural gas to 15% in the energy basket, energy imports from CAR must increase. Thus, the nation has embarked on, and needs to continue its focus on strategic partnership and assured connectivity with the CAR.

Connectivity to Nations of CAR

Challenges

India does not share land borders with CAR. Further, connectivity to the region is challenged by the US-Iran tensions, antagonistic relations with Pakistan and instability in Afghanistan. The energy and mineral-rich CAR is mostly landlocked and dependent on Russia and China for trade links to the outside world. The internal instability and religious extremism have further made the situation complex.

International North-South Transport Corridor (INSTC)

INSTC was initiated in the year 2000 and ratified by India, Russia and Iran in 2002 to provide the shortest transport network to the member states and enhance connectivity to landlocked CAR. It comprises a multi-modal

7200 km transportation system to connect the Persian Gulf and the Indian Ocean with the Caspian Sea and Russia.[15] India is trying to include Afghanistan, Uzbekistan and Chabahar Port in the corridor. The project acts as a Gateway for India to expand trade with the CAR and Russia (Fig 1).

Fig 1: The International North-South Transport Corridor[16]

Ashgabat Agreement

To develop the shortest trade route between Central Asian Countries and the ports of Oman and Iran, an agreement was signed between Turkmenistan, Oman and Uzbekistan. India joined the agreement in February 2018 with the strategic aim of establishing connectivity to Eurasia.

Engagement with China and Russia

The Genesis. Post breakup of USSR, Sino-Russian relations have been strengthening and border issues were resolved on 14 October 2003. The countries have collaborated in various multilateral forums, especially the Shanghai Cooperation Organization (SCO), whose mandate progressively expanded to accommodate the geo-strategic and economic aspirations of

the CAR. Traditionally considered Russia's backyard, there was an implicit acceptance of Russia being the chief guarantor of security of the region. After the global financial crisis in 2009, China emerged as the leading economic player in the region. From less than $1 billion annually in the 90s, trade between China and CAR was US $30 billion in 2019 as against $18.6 billion between Russia and Central Asia.[17] The growing Chinese influence is indicative of Russia ceding space to China for economic growth of the region.

Diverse, yet United. The unifying factor for Russia and China in this region is their diverse strategic objectives. Russia's key interests lie in retaining its hegemony in the politico-security domain and being the primary guarantor of security. Kazakhstan, Kyrgyzstan and Tajikistan have Russian military bases and military intervention in the Ukraine crisis of 2014 points to the sensitivity of the nation to Western incursions in its backyard. In contrast, China is driven by economic interests, led by energy security and securing overland routes for trade with West Asia and Europe. Concurrently, China wants to isolate its restive Uighurs in the Xinjiang province from Islamic influence prevailing in the CAR. Its strength lies in its investing power and institutions have lent billions of dollars to CAR regimes.

Russia follows a collective policy, wherein, it has devised multilateral forums. The Commonwealth of Independent States (CIS), Collective Security Trade Organisation (CSTO) and Eurasian Economic Union (EAEU) were created and continue to counter-balance similar Western constructs.

China on the other hand is largely following a bilateral policy, wherein, it engages one on one with member states for economic interests, energy security and to advance BRI. The Chinese initiative has fostered free trade zones and does not adhere to norms of multinational forums that regulate economic relations or force adherence to some specified foreign policy line.[18] The Quadrilateral Cooperation and Coordination Mechanism between Tajikistan, Pakistan, Afghanistan and China for counter-terrorism is an indicator of China's growing security role in Tajikistan.

Investments in transport, infrastructure and energy projects by China have enabled the BRI route to pass through Kazakhstan, Belarus and Russia (EAEU territory).

CAR Perspective. The nations are conscious of their historical and contemporary relevance and realise their position as a *Great Game Arena* to

leverage from multiple players viz. Russia, China, Turkey, Iran and the EU. There is a lurking fear of Russia and its attempts to "re-Sovietize" the Eurasian space. Thus, a deliberate strategy to break away from Russian culture and encourage ethnic linguistic and cultural sentiment seems to be unfolding. While China's economic clout and ambitions provide an opportunity for economic and infrastructure development, there is growing Sino-phobia due to unbridled expansion and debt traps. This has led to anti-China protests and conflicts between residents and Chinese workers.

The contentious issues between China and Russia are likely to increase in the coming years, especially with China starting to overlap with the security interests of Russia. Concurrently, BRI carries inherent risks of growing anti-Chinese sentiment due to different cultures and threats from terrorist organizations.

Engagement with India - Positive and Aspirational

India views CAR as an extended neighbour. Despite historical linkages and social and cultural affinity, the growth trajectory has just been incremental due to a lack of connectivity on ground and common strategic interests. The overarching influence of Russia, innate political instability and internal security situation in the region were also impediments to establishment of robust engagements. Indian diplomatic relations with the region were first established in the year 1992.[19] In January 2019, India and the CAR hosted the first foreign ministerial meeting to explore strategic partnerships in the fields of education, science and technology. The 2nd meeting of the India-Central Asia Dialogue in October 2020, and the decision to hold it annually, provide an alternative institutional framework for cooperation between India and the Central Asian countries. In this dialogue, India announced a US $1 billion Line of Credit and an innovative grant financing mechanism for High Impact Community Development Projects in Central Asian countries.[20] Salient features of the relationship forged with each of the five countries are elucidated below: -

- **Kazakhstan**. India and Kazakhstan are strategic partners since the year 2009, with bilateral trade amounting to US $981 million. The Heads of the two states have repeatedly visited each other. India and Kazakhstan actively cooperate at various multilateral forums. The two states have supported each other's Non-Permanent membership in UNSC. Kazakhstan also supports India's bid for permanent

membership in UN Security Council.[21] The inter-Governmental Commission of the two nations established in 1993 is the apex body steered by Minister for Petroleum and Energy and co-chairs trade, technology exchanges, cultural and industrial cooperation. Joint working groups are active in the field of IT, Hydrocarbons, space and defence. The defence cooperation framework between the two nations is governed by a Defence and Military Technical Cooperation Agreement 2015 to include joint exercises, technical cooperation and UN peacekeeping. In addition to joint exercises, the two countries are working towards joint production of military platforms for the three Services. More than 100 premier training and educational institutes are part of the education exchange programmes. Over 1000 professionals in Kazakhstan have benefited from the Indian Technical and Economic Cooperation (ITEC) programme.

- **Turkmenistan**. India and Turkmenistan enjoy warm and friendly relations through shared historical and cultural links. India has participated in the Caspian Economic Forum and Eurasian Group on Combating Money Laundering and the Financing of Terrorism and was a co-sponsor to Turkmenistan's resolution in the UN for declaration of 2021 as 'International Year of Peace and Trust' at the 73rd session of UNGA on 22 August 2019.[22]
- **Uzbekistan**. The upward trajectory of India-Uzbekistan relations is maintained by regular exchange of high-level visits. The Defence Ministers met at Tashkent in November 2019 and inaugurated the maiden joint military exercise between the two countries.[23] Uzbekistan has the bust of Sardar Vallabhbhai Patel and a street named after him in Andijon. During the maiden visit of Mr Mirziyoyev, the President of Uzbekistan, seventeen agreements/ MoUs were signed in the fields of law, tourism, military education, agriculture, science and technology, commerce and industry, pharmaceutical, national security, and illicit trafficking. India also has a Line of Credit of US $200 million for projects in the social sector with further possibility of providing US $800 million in Line of Credit and Buyer's Credit.[24]
- **Kyrgyzstan**. On the independence of Kyrgyzstan in August 1991, India was among the first few nations to establish diplomatic ties. The country supported India's membership in Shanghai Cooperation Organisation (SCO), and it's bid for permanent membership in UNSC.

The two countries have signed multiple framework agreements to include trade and economic cooperation, culture, civil aviation, avoidance of double taxation etc. Shri Narendra Modi visited Kyrgyzstan twice in 2015 and 2019, where he signed a declaration on establishing a strategic partnership with Kyrgyzstan.[25] MoUs on Health, Export-Import Bank, IT and Strategic Studies have also been signed in past. Bilateral trade was approximately US $59.53 million in the year 2018.[26] A five-year roadmap to enhance trade and investments was signed in 2019 to exploit the full potential of trade. Under the ITEC scheme more than 1274 slots have been utilised by the professionals of the Kyrgyz Republic. An agreement on Defence Cooperation was signed in 2015 with the Indo-Kyrgyz Defence Cooperation. Joint Exercise *Khanjar* is an annual affair for the special forces of the two nations. The last exercise was held in Bishkek in April 2021 despite COVID-19.[27] India has also extended a line of credit worth US $200 Million to support Kyrgyzstan Defence Forces Modernisation Plan. There are about 900 Indian Nationals including 800 students in Kyrgyzstan. A visa-free regime for diplomats, officials and service passports of the two nations is effectively in force.

- **Tajikistan**. India and Tajikistan share cordial relations and high-level visits over the years have strengthened the bilateral relationship. Both countries are signatories of multiple MoUs on space technology, disaster management, renewable energy, agriculture etc. They have five bilateral consultative mechanisms for counter-terrorism, trade, science and technology, defence and peaceful use of space. Bilateral trade stands at US $20.51 million in export and US $0.29 Million in imports in the year 2019 by India.[28] At international forums too, India and Tajikistan have displayed close cooperation. Tajikistan has extended support for the Non-Permanent membership in UN Security Council, and also for membership of SCO. India has provided humanitarian assistance and financial support for multiple infrastructure projects. Tajikistan hosts the first Indian overseas military base located at Farkhor.[29] As part of capacity-building measures, India has trained Tajik diplomats, financed training for remote sensing and allotted over 1425 ITEC slots and 360 scholarships. Approximately 1550 NRIs in Tajikistan, including 1250 medical students, contribute US $8.4 million to the Tajik GDP.

Withdrawal of US and NATO Troops from Afghanistan

USA has already withdrawn its troops from Afghanistan.[30] It is expected that Taliban-controlled territories could become safe havens and breeding grounds for terrorists, who may be employed against Indian and CAR interests. The terrorists are also likely to target INSTC, which is critical for Iran and India. Moreover, China is likely to fill the vacuum created by the US troop withdrawal and will attempt to play a greater economic and political role in Afghanistan.[31] Additionally, the contours of Pak-Russia relations would be a vital factor for India to evolve a strategy for engagement with Afghanistan. The present scenario has a likelihood for CAR to face a potential threat from Islamic extremism.

India is alive to the repercussions of US and NATO troops' withdrawal from Afghanistan. To safeguard its national interests, India is working towards enhancing its diplomatic clout in the region including in Afghanistan. Towards this, the Foreign Minister of Afghanistan attended the India-CAR Virtual Dialogue held on 28 October 2020, as a special invitee. The forum called for the settlement of the Afghan conflict based on the principle of an Afghan-led, Afghan-owned and Afghan-controlled peace process.[32] The ministers expressed their interest in the economic reconstruction of a united and sovereign Afghanistan.

President Joe Biden may have implemented Donald Trump's Afghanistan withdrawal policy, but in doing so has allowed the Taliban take over of Afghanistan to adversely impact the geo-strategical space in the region. The country appears to be taking on hues of a Muslim cleric state amidst eroding respect for human rights. These actions will have global repercussions and also have the potency to destabilise the region further.

Conclusion

CAR has epistemic dynamics as the core interest with India, Russia and China, who are also members of various multilateral organisations that include G-20, BRICS, SCO and RIC.[33] The CAR is likely to be the centre of political, economic and military power play or '*The New Great Game*.' Multiple states are employing trade and financial incentives in the region to pursue energy security. Traditionally, Russia has been the biggest regional player but is slowly being replaced by China. India and Russia have a convergence of interests in the region, and it is time for the two countries to take up joint economic projects in the region. China and India are pursuing

strategies of BRI and Connect Central Asia respectively. China is the largest crude oil importer in the world and its energy requirements are likely to double by the year 2050 from 13.5 million barrels of crude oil in the year 2018. The natural gas demands are also likely to inflate by 190 per cent during the same period.[34] The demand for Uranium from the region is spiralling upwards for Chinese nuclear power plants.

While China has operationalised oil and gas pipelines from the region, India is yet to make headway in infrastructure build up due to geographical constraints. Energy-rich CAR is vital for source diversification and could lead to a power play between China and India. Like China, Russia is also interested in importing energy and mineral resources and would like to flood CAR with its manufactured goods. In summary, India's approach is that of a constructivist, while China seems to be hegemonic, and Russia is the archetypal elder Big Brother.

Nations of CAR and India - Way Ahead for Transcending from Relationship to Partnership.

- India's constructivist role in sharing and building knowledge bases with CAR nations is seen as an extension of its foreign policy in which symbiotic growth for all partner nations is a top priority. This could very well form the bedrock of an India-CAR partnership.
- There are a large number of Soviet-era military facilities in the CAR that continue to be vital to Russia.[35] The Indian defence forces are also using many weapon systems of Soviet/ Russian origin which require a major upgrade. Several companies in CAR, especially Kazakhstan, have expertise in naval platforms, aviation and missile technology. There is vast potential for the Indian defence sector for joint ventures for the production of missiles, torpedoes and other associated systems. Many Indian firms such as Ashok Leyland, Bharat Electronics, Zen Technologies, Alpha Design Technologies and Hindustan Aeronautics had expressed keen interest in joint production of equipment like Rifles, Protected Vehicles, Artillery Systems, Cruise Missiles, Aviation Assets, Radars, Air Defence Equipment, Software and Simulators for Training Solutions etc.
- CAR has adequate resources to meet demands of the world market for critical minerals and energy sources. Russia, China and India may explore the option of joint ventures for the mining of critical minerals

and energy resources.

- India should leverage its historical, cultural, people-to-people contact and civilizational bonds with CAR to secure its national interests and continue to give impetus to high-impact projects for socio-economic development.
- The INSTC and other infrastructure projects such as TAPI and Chabahar port in this region must be made operational at the earliest to establish direct transport communication with Central Asia.
- Formulate and implement an optimal strategy to engage with and develop a relationship with Afghanistan, post-exit of US and NATO troops.

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BLOCKCHAIN TECHNOLOGY AND NAVAL APPLICATIONS: BETTER LATE THAN NEVER

Lieutenant Commander Gaurav Verma

We must take the blockchain as an important breakthrough for independent innovation of core technologies, clarify the main direction, increase investment, focus on several key core technologies, and accelerate the development of blockchain technology and industrial innovation.

- President Xi Jinping[1]

(at the Political Bureau of the Central Committee meeting on 24 October 2019)

Embracing blockchain technology and Artificial Intelligence will be beneficial for all sectors.

- Prime Minister Narendra Modi[2]

(at 54th Convocation Ceremony at IIT Kanpur on 28 December 2021)

Background

The above two statements give key insights into the different types of approaches adopted by the two emerging economies in espousing new technologies. One premier spoke precisely and to the point as to what is required, how to make headway about blockchain technology and the end goal. On the other hand, the other version is an all encompassing statement and definitely, two years late. Arriving at every technological and innovation milestone at the earliest should not only be stimulated but also needs to become a prime objective. It behooves a potential world leader to take the lead and promote this revolutionary technology and use it to augment India's position in the new millennium.

China has made fundamental system preparations for its digital economy. In this regard, blockchain technology would be one of the core building blocks in establishing an effective system. The integrated application of blockchain technology has the wherewithal to play a pivotal role in future military tech innovation in the country. This paper aims to examine nuances of blockchain, discuss its needs and advantages, whilst

exploring ideas for implementation in the Navy and put across recommendations to double down on the tail chase with technological upgrades.

Introduction

The word Blockchain sounds familiar to many but it has become a complex word for a simple concept. Ledgers and records have been at the core of commerce for ages, being used as records for numerous resources, such as the exchange of articles, money and property. An extended arm of this concept, a distributed ledger, at its essence is an asset storage that is shared across multiple sites, geographies, or institutions. All network participants have their identical copies and any changes need to be reflected across all entities. Distributed ledgers also have been around for thousands of years, with the first notable implementation being a banking system used by the Roman Empire that allowed people to participate in transactions across its regions. They also extended this concept to paper cheques, which fed into the ledger to record transactions.[3]

Extension of these ideas into the digital domain began in the nineties which led to the concept of Distributed Ledger Technology (DLT), and has been described as a consensus of replicated, shared, and synchronized digital data geographically spread across multiple sites, countries, or institutions. This led to the creation of global blockchain systems.

What is Blockchain?

Blockchain is a system of recording information in a way that makes it difficult or impossible to change, hack or cheat the system. It is essentially a digital ledger of transactions that is duplicated and distributed across the entire network of computer systems on a blockchain network.[4] So instead of one computer or authority, which holds all the information, now the database is spread across the entire network. These ledgers are immutable, meaning that they cannot be changed without proper consensus, or agreement, among network participants.[5]

Any attempt to alter any block will alert the participants of the tampering attempt. "Smart contracts" can be created to apply business rules automatically as contractual or business obligations are met. A similar concept can be used in military terms to pass instructions as directives/ orders apply automatically, once a tactical or operational situation is

achieved. The 'distributed' nature of the ledger ensures that all participants (different fighting units, formations, fleet and flotillas), across different geographies and environments, can transact with a shared common view.

Blockchains can also be used to provide high-quality, trusted data on a large scale to track any asset and transaction, ranging from ammunition tracking or audit data for physical or digital objects (e.g. the tracking of weapons/ machinery parts for delivery, turnaround or maintenance schedule, data recording and analysis of weapons firing to assess technical/ human errors).

Key Technologies within Blockchain. Blockchain technology has undergone more than ten years or even decades of development and evolution. Aside from a combination of existing technologies, new technologies have been integrated and innovation has been continuously explored. The key technologies involved are mainly: -

- **Block+Chain**. This is a basic structure for data recording. The block is composed of a block header and a block body. The block body is responsible for recording data from the previous period, mainly quantity and details. The block header encapsulates the current version number, the former block's address, and the time stamp.[6]
- **Point-to-Point Communication**. The blockchain uses a Peer-to-Peer (P2P) network for communication, making each user in the network not only a node but also a server. The resources and services in the network are scattered on all the nodes, and the transmission of information and the realization of services are performed directly between nodes without any intermediary participation or server intervention.
- **Consensus Mechanism**. In light of this mechanism, any node in the network can produce new blocks, provided that the new block meets pre-set requirements of the consensus mechanism, i.e., to be recognized by all nodes in the entire network and added to the shared blockchain with independent storage[7]. *The consensus mechanism may sound verbose but it is essentially an agreement to make any change or addition/alteration to the data block upon reaching a pre-defined situation or outcome*.
- **Smart Contract**. It is a set of procedural rules and logic realised through decentralised, trusted, and shared script codes deployed on the blockchain. Generally, smart contracts are signed or encoded by

relevant parties (authorities such as OTC, Fleet Commander or Theatre Commander), and then attached to blockchain data in the form of program codes. Smart contracts encapsulate several predefined states, transition rules and scenarios that could trigger contract execution (e.g. clear to engage targets after reaching certain coordinates) as well as response actions in specific scenarios. The blockchain can monitor the status of smart contracts in real-time, and activate and execute the contract after checking external data sources and confirming that certain trigger conditions are met. Smart contracts can ensure traceability, irreversibility and transaction security in the absence of third parties.[8]

Relationship with Artificial Intelligence (AI), Big Data and the Internet of Things (IoT). The development and application of blockchain technology will not be possible without infrastructure support of next-generation information technologies such as AI, Big Data, Cloud Computing, and the IoT. In turn, blockchain technology has also promoted advancing of these information technologies. Combined with the decentralization and data tamper-proof characteristics of the blockchain, it has potential of promoting widespread application within the military domain.[9]

Where We Stand. Blockchain technology may not be an easy concept to appreciate for our military forces which are rapidly transforming into technologically enabled forces. The sooner they embrace this concept, the better. The opportunities offered by implementing widespread use of blockchain technology are immense and its non-application can have a negative impact. To push ourselves as a world leader in technological innovation, there is a need to engage with policymakers, the private sector, and academia to promote research and development of blockchain technology into the military fabric. While the USA, China and Russia have invested millions of dollars on Research and Development (R&D) in blockchain technology, the policymakers of our country are still attempting to understand what this technology is all about. Regulators are still trying to enforce old laws on new technology (banning of cryptocurrencies, high taxation on the exchange of crypto etc.).

Prospects - Military Application

The practical applications of this technology are numerous and can

cover the entire spectrum of military warfare. However, some of the major and significant applications which will facilitate appreciation of direct implications and future possibilities have been elaborated below: -

- **Naval Logistics**. Blockchain technology can create a separate, secure, shared and permanent record as well as help track and audit transactions of various supply chains and among all operating partners. It can also perform effective lifecycle management on defence supply chains and the system of procurement and logistics.[10] By incorporating blockchain technology into the military logistics network, a decentralised autonomous network of personnel and materials in logistics systems can be built. Data related to production, procurement, transportation and distribution of materials in the systems can be stored in various blocks in a unified manner, which can greatly improve the security of military logistics information, and enable military logistics to meet requirements of various services and departments. Modern military logistics involves intelligent warehousing, packaging, transportation and distribution. The different processes morph into a small military IoT, which is based on a dynamic autonomous network of people and objects.
- **Blockchain + Command Information System**. The command information system is a vital method to form a real-time, accurate picture of war and help headquarters implement methodical and efficient management of subordinate units and weapons. As an organic "human-machine" system, taking Commanders to be the core, and using computers and other information technology equipment as the prerequisite and material guarantee, the system progressively combines various command-and-control methods to enable high-level automation in the collection, transmission, processing and usage of military command information.[11] It ensures data integrity, availability, and security of the command information system, and guarantees enhancement of combat effectiveness and the successful seizure of initiative in a war.
- The command information system has centralized networks and a common database. As an important target in wartime and even peacetime, it is vulnerable to enemies, adversaries or hackers. The enemy may use information warfare to conduct network and electrical attacks, causing the entire information system to be paralysed, or to

steal and falsify identity information by tampering with important data. Therefore, Commanders face great risks in data authenticity. Relying on incorrect or fallacious data can seduce Commanders into making wrong decisions and issuing false commands. The enemy could also pass fake orders by tempering data. All these issues however, can be avoided by using blockchain technology.[12]

- **Blockchain + Lifetime Weapon Management**. Modern warfare requires Combat Systems to have alacrity in response and agility. These however, need a large amount of data to be recorded such as design plans, test results, and combat technology status during the whole lifecycle of weapons, from project demonstrations, development, production, and from delivery to service to retirement. Information can be easily lost or tampered in the process. Based on blockchain technology, building a lifecycle weapon and equipment management system jointly operated and mutually supervised by developers, producers and users is possible.[13] With the system, users can track and manage equipment design parameters, test data, combat technology status and maintenance records. No content can be manipulated or deleted, which improves information security, convenience and credibility. All management actions will rely on smart contracts for open and transparent decisions, reducing management hierarchy, and finally improving efficiency. At the same time, every component of weapons and equipment can be traced to their origin, which helps resolve disputes over procurement contracts, and constructs a complete unbreakable monitoring, management and control system, thus improving management security, convenience and credibility.
- **Blockchain + Sensitive Data Management**. Using the tamper-proof feature of blockchain technology, we can provide a solution to the problem of 'hard to maintain evidence' in sensitive data management in military inspections and supervision, human resources, medical and healthcare. 'Truthful record' of all information can be realised through 'whole-network witness,' thus avoiding counterfeit documents, missing files and information tampering.
- **Naval Procurement**. New ways of contract management and transparency in the procurement process on a real-time basis provide increased efficiency for both naval contracting directorates and the private sector contractors providing goods and services. Just as the

Government of India and the Navy found a way to build new applications and make distributed systems possible on the internet through the Government eMart (GeM). Blockchain enables new capabilities by offering a layer of trust that the Navy can apply to improve its procurement process.

- **Naval Data Security**. Security of battlefield data transmission has to be ensured, and problems of signal interception, deciphering and reconnaissance need to be resolved to optimally ensure having an edge over the enemy. By using quantum key distribution as a replacement for the original private key structure, and tapping into the anti-eavesdropping and anti-interception features of quantum cryptography in the blockchain network, we can greatly improve the robustness of the blockchain network as demonstrated by the Russian Quantum Centre and Russian Academy of Sciences, which successfully tested the first quantum blockchain system.[14]

Drawbacks of Blockchain

Like any other developing technology, blockchain also suffers from certain problems, which can be mitigated through research and development. However, the challenges are minor as compared to the benefits achieved. Some teething issues which the end user may face are as follows: -

- **Time and Processing Power Intensive**. It is challenging to meet high-frequency response requirements with a complex data synchronization mechanism. Each data modification in the blockchain requires all nodes in the system to update ledger data synchronously, which takes a long time. Modern warfare requires split-second decision making, especially at the tactical level. This means situational information updates are required faster, and combat units stream information at high data rates. It can be difficult for blockchain technology to meet these real-time response requirements instantaneously.
- **Data Security Risks**. The consensus mechanism and encryption algorithm still have security risks. The security of the blockchain technology consensus mechanism depends on the cryptographic algorithm, which by itself is not secure and there are still risks to be proofed against. At present, leading technology developers are stepping

up efforts to make breakthroughs in quantum computing technology. Once a reliable and practical quantum computer is developed, most blockchain technologies of today may become redundant unless updated.[15]

Way Ahead for the Indian Navy

It is imperative that the relatively new blockchain technology and its advantages be understood by policy makers and that it gets a 'go-ahead' for implementation. The Navy has become virtually digital in its data transfer, management and storage as seen through the use of *Rukmani*, Maritime Domain Awareness Operation Centres etc. The blockchain allows these systems to become smarter and more efficient. A roadmap and suggestions for achieving the desired state have been discussed below: -

- **Formation of Blockchain Team**. A team comprising personnel from various branches and backgrounds at Naval Headquarters level is required to perform the role of a think tank, understand the technical advantages and challenges of every scenario whilst exploring various avenues where blockchain can be introduced in the *IN* to attain efficiency in naval warfare. As discussed earlier, the applications of the technology are varied and many. But certain areas such as the use of blockchain in Maritime Domain Awareness (MDA), Tracking Radars, Satellite Communication and Quantum Communication, Electronic Warfare, Charge Books, Charge Documents, Cipher, Sensitive Data Handling, Maritime and Joint Operation Centres, War Room, Audit Organisations etc. can be given priority. These systems and nodes/ centres can enhance efficiency, efficacy and allow the *IN* to reap the benefits which this technology has to offer.
- **Pilot Testing**. A selected area from the above mentioned domains/ systems offering flexibility and learning opportunities, can be used for pilot testing. The operation will offer insight into the problems with integrating blockchain into existing naval networks and would also bring out the deficiency in system hardware and software configuration. The advantages assessed can be used to predict the nature of this tech in other fields. This in turn will serve as a guide for identifying the hardware and the software requirements for the induction of blockchain technology, its application and the goals to be achieved. A pool of personnel trained in this tech will also be required

to be appointed at its various nodes.

- **Partnership with Blockchain and AI Firms**. The more efficient and expeditious way to integrate blockchain into the Navy can be pursued by partnering with the private sector industry leaders offering state-of-the-art services such as Tata Consultancy Services, Tech Mahindra, Infosys, Zensar Tech etc. Also, partnerships with leading Higher Education Institutions in technology such as IITs can be beneficial for making headway and supporting the road map for induction of this technology.
- **Conceptualisation at Fleet and Flotilla Level**. A detailed study into the Cost-Benefit analysis of implementing blockchain technology in the fleet and flotilla, and the advantages gained in terms of battlefield superiority will offer a clear understanding of its intrinsic value. The known benefits in terms of ordnance delivery, tracking, electronic warfare, MDA, sensitive data handling, logistics benefits, etc. have been discussed and will certainly offer us an edge over the enemy.
- **Implementation at Material Organisations**. The benefits of implementing the technology in logistics have been discussed earlier. Larger organisations such as Material Organisations, Naval Armament Depots and other contractual offices will benefit from accurate information of products, parts, handling and even real-time tracking data. This information will not only facilitate better and more efficient stocking but will also help in autonomous operations in terms of placing demands and supply chain cycles when integrated with AI. The expertise gained from these organisations will help the *IN* to proceed with implementation in other diverse areas/operations.
- **Blockchain Education**. Blockchain courses are fast becoming a first choice of major engineering and technical courses in the civil world. With the *IN*s policy of BTech qualification becoming compulsory for executive branch officers, it becomes imperative that blockchain is introduced in the syllabus at our training and professional military education institutions.

Conclusion

Blockchain can be seen as enabling machinery with a distributed ledger that allows for the integration of technologies and workflows that have not been possible before. The need to understand its radical transformation in

the digital field cannot be over-emphasized. India is in an advantageous position with a very high number of tech graduates and field experts which can propel India in becoming a major hub of this technology. Programmes like Digital India and *Atmanirbhar Bharat* are steps in the right direction.

Policy shifts of the Indian armed forces towards modernisation and technology infusion are reassuring. However, passage towards an agile defence innovation ecosystem is difficult and needs to be more reactive and welcoming to testing and induction of emerging technology and trends. The Navy should move swiftly and develop innovative ways in which it can modernize naval warfare and other issues using blockchain fundamentals in order to be ready and prepared for future battlefields.

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TECHNOLOGY IN LEADERSHIP, TRAINING AND HUMAN RESOURCES MANAGEMENT

Commander LS Subramanian

Human Resources - People Matter

Human Resources (HR) is the biggest asset to any organisation and optimum utilisation of this asset directly impinges upon its effectiveness and efficiency. HR is not a silver bullet that can slay all organisation vampires, but it is a powerful tool whose utilisation can mitigate varied crises. The military is yet to take advantage of advancements in Artificial Intelligence, Machine Learning, HR and People Analytics. These advancements offer an opportunity to completely transform modern military forces, among others. A simple example will be the implementation of chatbots in a Unified Domain network that answer the simplest of questions, which may vary from the name of the movie being played at the Auditorium over the weekend to necessary forms for retirement formalities. The possibilities are endless.

Compiling huge military data into understandable and informative content is the need of the hour. Raw data is merely a motley collection of numbers that with the help of Analytics can demonstrate a linkage between people and outcomes. Using data analytics not only improves decision-making speeds but also helps leaders make better decisions, which is a win-win situation.

Let me first put some thrust on what all spheres these two words - Human Resources - amplify in military dynamics. It involves various departments which include pay and allowances, travel and expenses, training and development, appraisals, employee engagement activities, benefits, rewards and recognition, administration, disciplinary action, legal action, recruitment, retirement, welfare, etc. In short, it plays a crucial part in every defence personnel's military journey right from the time of induction till he/she bids adieu as a proud veteran. Handling of the Human Resource pool is a mix of people management and professional processes. In the Indian Navy, HR Management (HRM) covers the dyad of Compensation and Benefits, which is handled by the Naval Pay Office, and

Leadership and Organisation, which covers the balance of HR domains listed above. While they are supported by various departments to the best of their ability, the lack of a digital data chain hampers seamless operations. A common digital data chain, if facilitated, will help in better visualisation and quicker delivery of results in diverse fields like inventory management, pension benefits, ECHS and even recruitment.

Is Virtual Recruitment feasible?

The obvious question asked is how can traditional methods of in-person recruitment be done away with in the military environment. The use of AI-based digital recruitment designed software to understand the psychological profile of a candidate as per defence forces' requirements is a viable option. This digital transformation will be a cost-effective method, which could initially commence as a pilot project with the induction of the Officer entry scheme into the Indian Navy. This process could re-wire and re-vitalise the extant Service Selection Board (SSB) methodology and later, can also be used towards induction of *Agniveers* as well.

Digital transformation will be a cost-effective method for revitalisation

To understand this proposal better, let me elaborate further. Post-verification of essential qualifications as per the entry scheme and conduct of online examination selected candidates would appear in a virtual recruitment process. Here, the first step would be the 'timed psychological questionnaire' to analyse the attitude, military bearing qualities, mental makeup etc. and would be followed by a 'virtual interview (without an interviewer).' In the latter, questions would be flashed on the screen with sufficient time given to the candidate to prepare a suitable reply within a few minutes and the video reply would be recorded online. Finally, only filtered candidates would be asked to appear for the physical and medical tests at their nearby Military establishments and designated hospitals. This methodology, customised as per the requirement of the organisation can drastically bring down associated administrative and logistic requirements/costs.

The Millennial Mental Framework

In the era of Swipe technology, the younger millennials joining the forces lack one of the basic facets of life - patience. This is primarily

because the majority of them are influenced by social media platforms. Thus, it becomes mandatory to have better monitoring mechanisms for employee mental well-being, morale and motivation levels. A worrying attitude of duty personnel frequently found surfing mobile phones with headphones on, completely immersed in a world of their own is, unfortunately, becoming common. This kind of addiction primarily leads to prevalence of lifestyle diseases like depression, anxiety and stress. The readers of this article will agree with me that this grey area has been identified and necessary initiatives such as Divisional periods, ship's company get-togethers, Navy Day celebrations, *Barakhanas*, etc. are pursued regularly, but are these occasions enough? Is this generation actually communicating or are they just communicating arbitrarily connected in cyberspace via their mobile phones? Is seeking help of a psychiatrist considered taboo?

Addiction leads to lifestyle diseases like depression, anxiety and stress

The intention herein is not to find mistakes, but to find a solution which HR can utilise across the board. On similar lines, the age-old tradition of one-way communication or appraisal or feedback needs to be brought to par with millennial values. We need to practice a 360-degree feedback mechanism where the junior can also bring about or voice the pros and cons of the work environment in the written or online format.[1] This survey when taken must be anonymous and genuine criticism ought to be well taken. Here, I would like to stress that gossip and loose talk should be strictly negated and with professional maturity, the data must be recorded at the repository of HR management where peer appraisals are also evaluated. In parallel, an integrated website, rather a tributary of many, is to be hosted for the entire Indian Navy in which at the click of a button the entire history of an individual is made available including his last medical visit for Sick in Quarters (SIQ), Uniform excuse or additional emoluments or achievements. Needless to say, this information will be made available keeping confidential data rights reserved. This will allow a better understanding for superiors and the workforce to accordingly utilise varied skill sets and channelise personnel objectives as per organisational goals.

Adding to the above, is the main fear of attrition of trained manpower commonly faced by civil counterparts. This of course, in the military forces, is not a matter of great concern. But, attitude alignment as per the requirement of the Defence forces plays a much more vital role. It is a

separate topic by itself and also an important pitfall, which warrants a deeper study to ensure that the image of the Military forces continues to remain salutary.

Has the Return on Investment (ROI) been achieved?

Primarily, no tangible results and lack of quantifiable financial data are the main concerns why HR Management (HRM) appears to be accorded low priority in the defence paradigm. Simply stating that high morale and the well-being of the ship's company translates to better HRM practices is debatable. Here, the question of ROI is a figure that HR professionals quiz to define the actual worth of an individual. It is calculated by understanding the introduced change cost to that of the net benefit derived, which will dictate the continuity or early termination of the proposed change. This process has its share of trial and error and needs to undergo implementation of pilot projects before venturing forth pan Navy for accruing accurate data/results. Conducting a complete analysis of groups that underwent ROI calculation versus groups that did not can be used to estimate the effect. During this process, the key elements involved will be evaluation frameworks, process models, case applications and practices, operating standards, philosophies involved and finally, implementation. So, it's evident that the HR team has to formulate a policy to narrow down the exact strategy with which to satisfy the HR mantra of 'The Right Man for the Right Job at the Right Place and at the Right Cost.'

Is the Knowledge Reservoir of Reference Libraries being Utilised?

Reference libraries are well stocked with various HR management books, journals and periodicals emphasising the mantras, principles and ideologies needed for better work-life quality, increasing productivity and achieving leadership goals. But how much of this bookshelf knowledge, replenished annually, is utilised/researched for the implementation of better HR principles in the military? Undoubtedly the size and diversity that the Indian Navy epitomises is a challenge along with the factor of 'Time and Tradition.' The practice of recommended reads for Military Minds is a step in the right direction, but is it optimal to restrict the reading of books only to the submission of a Book Review with the annual performance report? How about making it a habit to imbibe these principles with the ever-changing times? The million-dollar challenge is to ignite the fire of learning amongst young minds so that the powerful and dormant power of this knowledge

reservoir can be unleashed in a positive manner across the varied facets of the *IN*, including HR.

How to Make Bonds stronger?

Employee engagement is a mutually beneficial task for the employee and employer. Positive relations promote productivity, improve work culture, reduce workplace conflict and ease communication channels. To truly leverage the power of a dedicated workforce, the following concepts could be considered: -

- In addition to the Commendations/ Awards/ pen picture at ACR, it is important to appraise the day-to-day work of an individual to boost momentum and break the monotony. This can be achieved even by simply putting in a few lines of appreciation on a stick note on a file/ a befitting reply on official Mail/ typing a quick SMS, etc. We must never underestimate the power of written words as they have a great emotional connection.
- Rather than waiting for Board room meetings towards brainstorming/ innovative thinking to happen, it's ideal to harness the proposed 360-degree feedback into actionable insights. Employees have great ideas to achieve tasks better, and this input can be gained instantly between the perennial discussion over smoke or during a stand-easy session or brief moments in the hallway or around the coffee machine.
- Creating a workplace that encourages passion projects of individuals will render significant dividends not only to the employees but also to improve the overall efficiency of the *IN*.

Adding on, understanding the fundamentals of psychology, like how to motivate employees and teams, is useful.[2] In HR, from the perspective of people, it is important to understand why people work and what they want from the organisation. Here, the two words, influence and persuasion play a vital role. These factors once practically reflected and practised are sure to improve morale, motivation, problem-solving and overall productivity.

People Analytics - Is it Time for the *IN* to Light this Torch?

A pun of reality example is that every desktop PC, pan Indian Navy, has this free analytical tool called Microsoft Excel already installed. But it so happens to be the least exploited program of all view technical ignorance. A

majority of personnel end up opening a new excel document for every new report. Every excel workbook has the option of multiple sheets with each having 1 lakh plus rows and 16k plus columns and personnel must be encouraged to use Microsoft Excel to carry out data analysis with forecasting predictions and not just to limit its use to save balance sheet reports or send quarterly reports.

As per Gestalt psychology, the human brain processes visual information better. Using data in the form of visualizing tools like scatter plots, bar charts, indicators, line charts, column charts, pie charts, etc are ways to communicate data in the form of a story. This form can enable stakeholders to understand their hypotheses and the context of the given problem better. This will then provide the organisation with some of the information necessary to dissect the problem at hand. Here, both the quantitative (metrics such as percentages, ratios, time taken etc) and qualitative (human observations like retirees' exit interview response, reason to decline a professional course, self-goals) number crunching is important. As said earlier, Analytics involves data analysis, visualization and validation.[3] Here, the data collected can be in the form of numbers, text, audio etc so this is primarily the variety. Already, the one way in which high-speed data is being captured is via RFID tags, which are chips and sensors allowing data to be handled practically in real-time. However, there is a huge volume of big data sets containing infinite bytes which remain unexplored. Finally, it is all about optimally exploring the four pillars of data analytics, which are descriptive, predictive, prescriptive and diagnostic.

Pillars of data analytics are descriptive, predictive, prescriptive and diagnostic

Challenges in HR are not because of the enormous amount of data to be dealt with, but rather its storage. HR data is often stored in different databases that usually are not readily compatible. Here, the correct utilisation of Data Mining to analyse big raw data to derive meaningful content is paramount. This approach applies machine learning algorithms to understand the pattern of relationships between elements in large and sometimes, messy data sets. The main bottleneck on this information highway is missing data, which is always a distinct problem in analytics. Also, outliers are another factor that distorts analyses. So, here it is important to understand various statistical tools like histogram, frequency, central tendency, mean, median, mode, standard deviation, distribution,

etc., which are used to analyse the variability existing in the data set. Such a complex dive into analyses will tell us the relationship between various domains (using correlation), how to go about making predictions (using multiple regression) and also how one group is different from the other (using t-tests).

Thus, using tools which complement surveys, analyse administrative data, conduct interviews and make focus groups give inputs for HR/ People analytics. This will help not only assess but also redefine the challenges we are addressing.

A smooth transition for Military Veterans

Are you making one-time MoUs with Corporate firms towards the recruitment of Military veterans? Are you conducting a day seminar for future retirees for a Pre-retirement capsule course? HRM can help you chart your course through all these requirements by the simple use of established technological norms and through judicious usage of advancements in the field as modern and avant-garde tools are not restrictive in nature. Transitioning veterans starting their second innings is another field where their usage can be of immense value.

HRM can help by using established technological norms and modern and avant-garde tools

HR Management can focus more on this pool of trained manpower and help them transition seamlessly into their new life post-retirement. This involves aligning and cross-referencing them as per their abilities in terms of job descriptions (vibrant and in demand), conducting job fairs, and revising the MoUs with the corporate sector every year. The data repository of men and women who are ready to 're-attire' post service could also be shared with prospective employers as this much-recommended talent pool will prove beneficial to both parties.

The Queuing Theory Concept

This concept is important to adjust to the mindset and psychological behaviour of present-generation manpower. Weightage needs to be given to understand the queuing analysis associated with the average waiting time, queue lengths, the number of servers, and service rates to optimally place the human resources. We all know the frustration of a long waiting time and insufficient usage of manpower as an indicator of poor-quality HR services.

This has a huge impact on the ROI of the operations carried out.

Let us take a simple example of Service hospitals at major establishments and the everyday challenges experienced therein. Here, it is important to do a statistical feasibility study using mathematical logic and analysis to get precise deductions whilst keeping all environmental factors associated with it. Here, studying the patient's arrival pattern, service time, the discipline of the queue, service staff available, service capacity and the number of parallel servicing channels will help us generate a suitable and useful model to provide better service. As said previously, the entire HR management is a chain of various services which need to have seamless connectivity to ensure a smooth and frictionless ride.

Innovative HR Practices

The need of the hour is innovative HR practices, to make sure that defence personnel feel motivated and keen to add value. In the end, it is finally people who portray culture of the organisation. Here, I list a few stepping stones that could help create a new roadmap for better HRM: -

- Certification revolution to up-skill personnel is the new badge that everyone is proudly showcasing in the digital world. Defence personnel should also be encouraged to do the same proactively as they stand as recognised proof of one's expertise in a field. It is strongly recommended to push this drive as part of the perpetual learning curve and development initiative. As a starting point, the amount allocated towards purchase of books, periodicals and magazines at various Reference libraries pan Indian Navy, could be utilised towards signing an MoU with the multiple Edu-Tech platforms available today.[4] These platforms offer wide certifications including those in HR domains like recruitment, compensation and benefits, end-to-end HR organisational development programs, Learning and Development Capsules, Strategic HR, Coaching etc.[5]
- Conducting bi-annual workshops in all HRM verticals, could well be a practice that will gradually bring in better transparency and knowledge gain through formal interaction with domain experts.
- Inclusion of technological platforms like Tableau, Power BI, SAS etc. whilst writing professional reports are a few of the latest tools used by the corporate sector. They are for better reporting skills that enable us to drive strategic HR decisions with compelling and visually

appealing data stories. HR metrics, data visualisations, and interactive dashboards are a must for the Defence forces towards effective strategic workforce planning.

- Coaching and mentoring can reduce the risk of unsatisfactory performances as per the role and responsibility of subordinate staff. In addition, this will help to identify the strength and skill gaps for management development. All this is to be part of the single platform database for ease in monitoring development of manpower in various subsidiaries.

Conclusion

It is important, that the entire data repository associated with the *IN* needs to be analysed so that correct and strategic HR management decisions can be taken. Further, diving deep into using tech tools, employee engagement, psychological connection and timely action is important to ensure the smooth modernisation of HR practices. Up-skilling the manpower as per individual and organisational needs is a key to better people management and improving the credibility of HR. HR analytics can't be kept siloed, no matter what the current profile of an employee is. Be it any branch of the Indian Navy, we all are surrounded by data every day and to move forward, this data has to be harnessed. In simple terms, everyone carries a piece of the puzzle but unless it is assembled collectively, confidence in the process cannot be gained. It is essential to understand the pulse or have the ability to resonate with various stakeholders of the organisation for better HR leadership training and higher management. The correct use of technological advancements in the field of HR will thus, help navigate the travails of large information caches, raw data, enormous numbers, people and processes while ensuring maximum positive impact.

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GOVERNANCE IN MARITIME ZONES OF INDIA: IMPERATIVES FOR THE INDIAN NAVY

Captain Tribhuvan Singh

The terror attacks of 26 November 2008 commonly known as 26/11 in Mumbai compelled the Indian Government to strengthen maritime, coastal and offshore security. These measures included inter-agency coordination, increased monitoring and regulations of maritime activity in the maritime zones of India.[1] The Indian Navy (*IN*) was given the responsibility and mandate of Coastal Security even during peacetime. *IN* mandate and capabilities to fulfil its constabulary role *vis-à-vis* the Coast Guard (CG) require synergy to arrive at efficient and effective enforcement of jurisdiction in the Maritime Zones of India. The Coast Guard or Navy on its own will be unable to fulfil the requirements of enforcing jurisdiction. The question that arises, therefore, is whether *IN* is mandated and empowered with present enactments and legislation to exercise such jurisdiction in maritime zones of India?

Relevance of Indian Navy in Indian Maritime Governance

The constabulary role of the Navy in complying with the requirements of maritime governance is directly linked to its mandate and capability. Indian Maritime Security Strategy (IMSS) includes this element of legal jurisdiction in maritime zones of India for the protection of the Indian coast and its offshore assets against attacks and threats emanating from or at sea.[2] *IN* has remained one of the main players in ocean matters and this additional responsibility for coastal security and policy imperatives for Blue Economy leaves it with no other choice than to take on the constabulary role more vigorously.[3] The various constituents of the strategy described in the IMSS lay down maritime security objectives and mandatory tasks of the Navy to respond to the requirements.

Coastal and oceanic space management are of great national importance. The Maritime Zones of India are nearly as large as the land territory of India but the concept of jurisdiction is not spelt out in any policy document. Although an integrated coastal management plan has been approved by the government post-2008 Mumbai terrorist attacks, there is an

absence of a national framework for the management of maritime zones of India. The existing Laws of the Sea have been derived from the understanding arrived at amongst various nations for respecting use of the sea. In past, a philosophical construct was attempted to explain or justify freedom of the seas vis-à-vis the extent of coastal state jurisdiction.[4]

Extant Legal Provisions to *IN* and ICG

UN Convention on Laws of the Sea (UNCLOS) 1982 invokes principles and precedent with respect to matters of varied requirements. The convention aims to accommodate the interests of coastal states in two ways. First, it gives each state freedom to take action in pursuit of these interests. Second, the treaty limits freedom of others to take action in a manner adverse to those interests. While the jurisdiction of a country in its land territory is exclusive and absolute, boundaries in the sea are difficult to draw, and maritime jurisdiction is a complex phenomenon with varying understanding by different stakeholders. Of note is that Indian law is mostly derived from Anglo-Saxon jurisprudence. English thought and concepts have influenced Indian legal development even after independence from colonial rule in 1947.[5]

In May 1976, India redefined its offshore limits by the Fortieth Amendment to Article 297 of the Constitution and enacted the 'Maritime Zones of India Act 1976.' After passage of this Act, a requirement for a separate maritime force was felt to enforce and ensure compliance with the provision of this Act. A CG organisation under aegis of the Navy was established on 01 February 1977 and remained till 19 August 1978. A permanent Coast Guard was then constituted on 19 August 78 as an "armed force" of the Union of India through the Coast Guard Act 1978 and became part of the Ministry of Defence like the three older armed forces. Thus, the CG became the principal agency for enforcing national legislation in the Maritime Zones of India. However, in times of hostilities, it would perform duties as assigned by the Navy. The missions and responsibilities of the CG are as below: -

- Dealing with safety and protection of artificial islands, offshore terminals and other installations.
- Protection and assistance to fishermen and mariners at sea.
- Preservation and protection of marine ecology and environment, including pollution control.

- Assistance to the Department of Customs and other authorities in anti-smuggling operations.
- Law enforcement in territorial as well as international waters.
- Scientific data collection and support.
- Lead Intelligence Agency (LIA) - for coastal and sea borders.
- Being the Commander of the Coastal Commands, the Director General (DGCG) has the responsibility for overall coordination between central and state agencies for coastal security.
- Offshore Security Coordination Committee (OSCC) and National Maritime Search and Rescue Coordinating Authority (NMSARCA). The Director-General of the CG is the Chairman of OSCC constituted by the Ministry of Petroleum and Natural Gas (MoPNG), of which the Flag Officer Defence Advisory Group is a member. He is also the NMSARCA for executing/coordinating search and rescue (SAR) missions.[6]

The MZI Act promulgated the requirement for foreign warships to give prior notification for passage through territorial waters of India.[7] Protection of offshore installations and oil fields was entrusted to the *IN*, and it remained a key element of India's interest in ocean issues.[8] *The Maritime Zones (Regulation of Fishing by Foreign Vessels)* Act came into existence in 1981 and further streamlined the enforcement jurisdiction in maritime zones of India. These enactments, along with the *Water Prevention and Control of Pollution Act 1974*; *the Indian Ports Act 1909*; *the Merchant Shipping Act 1958* and various supplementary statutory notifications aid the Navy and the Coast Guard in streamlining procedures of enforcement in maritime zones, particularly within the Exclusive Economic Zone.[9]

The rule of constitutional law and the scope of national authority over maritime zones is a reflection of the doctrine concerning relationship between the Laws of the Sea and municipal laws of the state. The Indian system of enforcing the jurisdiction can be understood as follows: -

- Under the MZI Act of 1976, India has claimed full sovereignty over the Maritime Zones of India. The CG is the principal agency for enforcing national legislation in the Maritime Zones of India.[10]
- While this became umbrella legislation, there was also a need to suggest separate legislation to provide for regulation in greater detail for the exploration and exploitation of resources in maritime zones. Besides officers of the CG, the Central Government has notified Navy

and police officers as authorised officers under Section 9/19th of the MZI Act, 1981.

- The Act also gives power to the CG to curb poaching activities of foreign vessels, including those chartered by Indian parties in our EEZ. To protect fishermen from the harm caused by poaching vessels, the Parliament enacted the MZI Act of 1981 and also made the rules under the Act called MZI regulations of fishing by foreign vessels in 1982. Certain amendments to these rules have also been issued from time to time.
- The rationale for forming CG was that the patrolling of maritime zones of India and protection of national interest is only a peacetime role for which defence assets should not be used more than was absolutely necessary. While *IN* ships manned by trained personnel would be very competent to perform various tasks within maritime zones of India, they could come at the expense of other operational and tactical combat training, maintenance and availability of naval ships and aircraft to the other roles of the Navy at the higher ends of a spectrum of conflict.[11]

Maritime Issues and Challenges

Maritime Zones of India. The maritime boundaries of India are categorised and defined in the MZI Act, 1976 as Territorial Seas, Continental Shelf, Exclusive Economic Zone and Contiguous Zones. Accessible charts and data have been used to demarcate the coastline in both Lakshadweep and Andaman & Nicobar Islands. In many cases, nautical charts may not be useful for this purpose. Even if used, the older charts may need to be converted to WGS 84 datum using appropriate datum transformation parameters. The existing baselines promulgated by Govt Gazette are in Everest Datum; these are required to be promulgated in the geocentric datum i.e., WGS 84. The Ministry of External Affairs, Govt. of India has notified the Latitude/ Longitude Coordinates in Indian Geodetic Datum, Everest Ellipsoid, 1956, of the points constituting the baseline for measuring the 12 nautical miles limit of territorial waters, vide Gazette Notification No. S.O. 1197 (E) dated 11/5/2009.

The Baseline corresponds to the low water coastline indicated on the official nautical charts of the coastal State. Situations arise when the coastline is not defined clearly, or where it is improperly described on

official charts on account of marked variations due to recession or other phenomena, such as erosion or accretion. In that case, a new geodetic survey may be appropriate to determine positions of the points that define the low-water line. If both the normal or straight baseline systems are used, the State needs to determine the sections of the coast to which each will apply.[12] The limits of such waters, shelves or zones of the mainland as well as the individual or composite group of islands constituting part of the territory of India also require updating. Areas of island territory require particular importance and the issues can be understood as follows: -

- **Andaman & Nicobar Islands**. India has submitted its baseline coordinates, except for the eastern coastline of the Andaman & Nicobar Group of Islands (ANI). The MEA promulgated a notification in 2009 declaring baseline for the coast of ANI. India followed a straight baseline method, but only on the west coast of the islands. This has not been put into action yet, and if India were to establish a baseline on the eastern coast as well, it will encircle the entire group of islands.[13] The baseline system for eastern A&N, once promulgated, may obviate any misunderstandings with our neighbours in the interpretation of established maritime zones and International Maritime Boundary Line (IMBL). However, if kept as it is, the advantages of ambiguity would work favourably in diplomatic negotiations and relationships.
- **Lakshadweep Islands**. As India extends its maritime partnerships in both the western and eastern regions of the Indian Ocean, the islands of Lakshadweep will receive increased strategic attention.[14] The closing of baselines also makes these waters internal waters of India. However, to enforce jurisdiction in the area, substantial force levels would be required. *IN* capability to enforce jurisdiction and the restriction on unhindered transit passage would also require to be thought of just as it might in the ANI, if so promulgated. Further, the capability of surface platforms and integration with MR aircraft, IMAC and IFC-IOR data fusion for the surface picture and generation of MDA would be a precursor for such an endeavour. Diplomatic calls may be required to be taken not to restrict the freedom of navigation of vessels passing through the sea lanes in the area.

Freedom of Navigation. The need for maintaining maximum freedom of movement for shipping is global, as all countries are dependent on it for trade. There is no provision in the UNCLOS requiring prior notification or

authorisation for the passage of foreign warships through any maritime zone, or for that matter even through the territorial waters of a coastal state. The recent events leading to a different interpretation of the situation between India and USA can be understood as follows: -

- The United States of America, without having ratified, has claimed an unrestricted Right of Passage as a practice that has existed for very long. It argues that a coastal state, cannot act arbitrarily or decide how the right may be withdrawn or modified. The US Navy's Freedom of Navigation Operations (FONOPS) are based on adherence to these considerations.
- India requires previous authorisation of the passage of warships through territorial waters. The case is on the thought that the passage of warships has a different functional end from that of a merchant ship and is *prima facie* an infringement of the sovereignty of the coastal state and if the passage of a warship is accepted without authorisation this is no more than a concession.[15]

Illegal, Unreported and Unregulated (IUU) Fishing. IUU impedes India's economic growth. The *Blue Economy*, an ocean-based economic programme for sustainable development, requires Indian control for fishing within the EEZ, as well as for exploitation of other resources in MZI. The presence of Chinese fishing vessels just outside the EEZ complicates matters for India and makes it difficult to monitor and regulate any infringements and foray into our economic zones. The following pointers would improve the understanding: -

- Article 73 of the 1982 UN convention sets forth provisions for the enforcement of laws and regulation of the coastal states in its EEZ.[16]
- However, it imposes the limitation on enforcement of laws in regulation on the coastal state in these zones primarily for prompt release of the arrested vessel on giving of reasonable bond or security and prohibition of imprisonment or of any other forms of corporal punishment for violations of regulations. Unless there is an agreement between the concerned states and lastly wrong notification of the flag state of arrest or detention of foreign vessels and subsequently of the action taken or any penalties imposed.[17]
- The CG authorities inform the Central Government of an arrest or detention of any foreign vessel or person. In turn, the Government informs the diplomatic missions concerned. These obligations,

although included in the MZI Act of 1981, do not bring out any distinction between the penalty of imprisonment and fines in the territorial seas *vis-à-vis* the imprisonment and fines in the EEZ.

- Therefore, there is a need to revise the MZI Act and spell out the provisions of a penal settlement or a Maritime Tribunal for the purpose.

Global Trends in Policy Reforms

The Maritime Affairs Unit of the Ministry of Foreign Affairs, Government of the People's Republic of Bangladesh, has recently enacted *The Bangladesh Maritime Zones Act*.[18] Similarly, Pakistan has also enacted *Maritime Zones Act 2020*. These acts provide for the declaration and determination of the maritime zones and give enforcement jurisdiction against piracy, armed robbery and theft, to make provision for punishment for matters connected therewith. Maritime Law Enforcement is defined as an assertion of jurisdiction over the vessel or aircraft in the maritime zones. Jurisdiction, in turn, depends upon the nationality, location, status, and activity of the vessel or aircraft over which maritime law enforcement action is planned.

The principles recognised in international law used for enacting criminal laws applicable to maritime law enforcement operations are also incorporated in these Acts. A Maritime Zones Tribunal is factored in for the trial of offences under the Act. It lays down provisions for ocean governance, blue economy and maritime cooperation and these Acts complement the ocean policy of the coastal state. Basic rules of armed conflict and the law of self-defence are also incorporated, thus making it all-encompassing for enforcement of jurisdiction in maritime zones. Extending penal laws and incorporating trial of offences and authorising power to Navy as authorised officers make it an umbrella legislation to deal with all issues of jurisdiction. It is recommended that the approach as adopted in such legislation may be replicated by GOI for amending existing laws accordingly.

Some Imperatives for Future Policy and Navy

Legal Imperatives. Maritime security and jurisdiction have international ramifications, often different from land-centric territorial examples. Usually, no single coastal state has the assets, resources, or capacity to do it alone. India’s interest in UNCLOS-82 has been met on major issues.

However, India did not succeed in getting acceptance of some of its proposals on the contiguous zone, archipelagic status for the Andaman & Nicobar Islands, enlarged safety zones, establishing designated areas in the EEZ, and requirement of prior notification for passage through the territorial sea of India by a foreign warship.[19] As mentioned earlier, India had, in anticipation, passed the Maritime Zones Act, 1976 claiming, *inter alia*, an EEZ extending up to 200 nautical miles and thereafter, the MZI Act (regulation of fishing by foreign vessels) in1981.

The law to be enforced within various maritime jurisdictional zones, and the authorities designated to enforce them, are numerous and complex. At present, these laws overlap geographically, and their enforcement is difficult. The authorities have two legal aspects: the municipal law power for specific provisions and the degree of force to be applied in its exercise. Although the MZI Act authorises use of force in effecting arrest, *IN* has not been given criminal or civil jurisdiction for this purpose. Problems may arise in connection with identification of offenders or the delegation of these constabulary functions to *IN* not ordinarily invested with them and increase the legal complexity. Problems may also arise in connection with identification of offenders, pursuit and arrest, and the proof necessary for conviction, which is a matter of municipal law but must be consistent with the requirements of international law.

It is recommended that a new legislation be enacted as a new Maritime Zones Act, incorporating requirements and understanding of current international maritime law. Alternately, India's Maritime Zones Act -1976 and MZI Act-1981 (regulation of fishing by foreign vessels) would have to be refurbished with necessary amendments. The jurisdiction and its enforcement may clearly define the following: -

- Jurisdiction over shipping.
- Constabulary roles of *IN*.
- National jurisdiction in territorial seas, contiguous zones and the high seas.
- Civil and criminal jurisdiction in these zones.

Structural Imperatives. The *IN*'s Maritime Capability Perspective Plan is required to be designed in a manner to augment and/ or build the force structure necessary to respond to all envisaged roles of Indian Maritime Security Strategy (IMSS). The adoption of UNCLOS provides the basic framework within which jurisdiction for the protection of maritime space or

territory is justified. The sovereignty can only be recognised if it is asserted and exercised by enabling jurisdiction and national laws. Achieving this plan requires an improved level of awareness, effective policy and integrated governance as well as capacity and capability building. India's maritime zones are a big space and the number of assets devoted to the task of maintaining good order at sea is relatively small. The size and shape of the Indian naval fleet will reflect the extent to which it will get involved in maintaining jurisdiction in maritime zones of India. Tasks include EEZ and coastal patrols, fishery protection, maritime law enforcement, search and rescue and general ocean surveillance. Any capability gaps are required to be made good at the earliest for *IN* to be seen as a preferred security partner in the region. Indian maritime interests, particularly for the constabulary role, would not only require more multipurpose surface units but would also need capable MDA through the air and space-based assets along with international cooperation on information sharing mechanisms. In addition to maintenance and war reserves, additional requirements of Maritime Patrol Aircraft and Unmanned Air Vehicles should be projected to meet these requirements.

Synergy with Coast Guard. The synergy between CG and *IN* across tasks is an area which would require attention. Both *IN* and CG need to synergise and complement each other to meet the requirements of maintaining good order at sea. The rationale for raising CG was that the patrolling of economic zones of India and protection of national interest is only a peacetime role for which defence assets should not be used. Additionally, this fourth arm of the Ministry of Defence as a service has the mandate to fulfil the requirements of enforcing jurisdiction in the maritime zones of India. If the responsibility and mandate of enforcing jurisdiction in maritime zones of India cannot be handed over solely to CG in future, then *IN* role *vis-à-vis* the CG is required to be synergised to arrive at efficient and effective enforcement of the jurisdiction.

Conclusion

Maritime governance requires planned and collaborative actions to administer maritime zones under India’s jurisdiction, with a multitude of agencies and stakeholders involved. The Indian Navy has primary responsibility for maritime security and the various constituents of the strategy described in the IMSS lay down maritime security objectives and

mandatory tasks, which have to be performed by the Navy to respond to these requirements. Jurisdictional issues are, however, not spelt out in any policy document. While *IN* and CG complement each other to fulfil the requirements of maintaining good order at sea, it is the CG which is mandated for the protection of economic resources in EEZ. The defence of offshore areas is the responsibility of *IN*, and the air defence for the same is undertaken by *IAF*. Post-2008 terror attacks on Mumbai, the Navy was given the additional responsibility and mandate of Coastal Security, for which doctrinal and legislative clarity should be addressed. This would always be a task in progress as the protectors and the transgressors would keep evolving their doctrines and strategies. The actions taken so far by the Indian government and the concerned security agencies seem to be pro-active and in concert with threat perceptions. The idea is not to be complacent and to rest on achieved laurels but to keep on one's toes. Therein lies the safety margin.

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VIKRANT'S OPERATIONS IN THE EASTERN THEATRE DURING THE 1971 WAR : A CASE STUDY ON THE CENTRALITY OF AIRCRAFT CARRIERS TO INDIA'S MARITIME SECURITY

Commander Karthik Balaji

"*During the 1965 war, Vikrant was sitting in Bombay harbour and did not go out to sea. If in the 1971 war the same thing happens, Vikrant would be called a white elephant and Naval Aviation would be written off. Vikrant has to be seen as being operational, even if we do not fly the aircraft.*"[1]

- Adm SM Nanda
Chief of the Naval Staff 1970-73

Background and Preparation for War

Since June 1970, *Vikrant* had remained berthed at the Naval Dockyard, Bombay with many internal fatigue cracks and fissures in circumferential rivetted joints of the water drums of her boilers that were beyond repair by welding. With long-term repairs of water drums not feasible indigenously, four new ones were ordered from Britain, and Naval Headquarters issued orders not to use the boilers until further orders. On 26 February 1971, the ship underwent a cold move from Ballard Pier Extension to the anchorage without replacement drums. The main objective behind this was to flash up the boilers at reduced pressure and run the main and flight deck machinery that had been idle for almost seven months. On 01 March, the boilers were flashed, and basin trials up to 40 shaft RPM (ahead and astern) were conducted. Fast pull-out trials of the catapult were also conducted on the same day, thereby proving the catapult steam supply modification in the forward machinery room. This modification was to later prove significant in permitting the launch of Sea Hawks despite the ship's operational limitations.[2] For ease of reading, all dates mentioned are for the year 1971.

The ship sailed out for Preliminary Sea Trials on 18 March and returned on 20 March followed by another trial sortie on 26-27 March. Based on these sea trials, operational limitations were imposed, restricting the boilers

to a pressure of 400 psi and the shaft RPM to 120 ahead and 80 astern, thereby reducing the ship's speed to 14 knots. With the growing threat of an imminent war with Pakistan on the horizon, there were serious concerns at Naval Headquarters regarding serviceability of Vikrant and the role that could be expected of her in the war. Apprehensions existed even among the highest echelons of the Navy regarding vulnerability of the carrier due to her compromised material state and consequent operational limitations. Additionally, the three Daphne-class submarines acquired by the Pakistan Navy posed a significant threat to the carrier. To mitigate these concerns, 500 hours of auxiliary steaming trials were undertaken on the three remaining boilers. Thereafter, no further deterioration was observed. In June, extensive deep-sea trials were carried out, with steel safety harnesses around the three operational boilers. Observation windows were fitted as a precautionary measure to detect any steam leaks. By the end of June, the trials were complete, and Vikrant was cleared to participate in operations, with its speed still restricted to 14 knots.[3]

As a part of preparations for the war, Vikrant was assigned to the Eastern Naval Command, and then to the Eastern Fleet. This fleet consisted of INS Vikrant, the two Leopard-class frigates INS *Brahmaputra* and *Beas*, the two Petya III-class corvettes, INS *Kamorta* and *Kavaratti*, and one submarine, INS *Khanderi*. The main reason for strengthening the Eastern Fleet was to counter the Pakistani maritime forces deployed to support military operations in East Bengal. A surveillance area of 18,000 square miles was set up in the Bay of Bengal.[4]

In the meantime, intelligence reports confirmed that Pakistan was to deploy a US-built Tench-class submarine, PNS *Ghazi*. *Ghazi* was considered a serious threat to *Vikrant* by the Indian Navy, as *Vikrant*'s approximate position would be known to the Pakistanis once she started operating her aircraft. Out of the four available surface ships, INS *Kavaratti* had no sonar, which meant that the other three had to remain in close vicinity of *Vikrant*, without which the carrier would be completely vulnerable to attack by *Ghazi*.[5]

On 23 July, *Vikrant* sailed off to Cochin in company with the Western Fleet. After completing the radar and communication trials on 28 July, she departed for Madras, escorted by *Brahmaputra* and *Beas*. The next major problem was operating aircraft from the carrier. The Commanding Officer of the ship, Captain (later Vice Admiral) S Prakash, was seriously

concerned about flight operations and that aircrew morale would be adversely affected if flight operations were not undertaken. Naval Headquarters remained stubborn on the speed restrictions and sought confirmation from the captain as to whether it was possible to embark the *Alizés* without compromising the speed restrictions. The speed restrictions imposed by Headquarters meant that the INAS 310 *Alizés* would have to land at close to stalling speed. Eventually, the aircraft weight was reduced, which allowed several of the aircraft to embark, along with the Sea-Hawks of INAS 300.[6]

By the end of September, *Vikrant* and her escorts reached Port Blair. Enroute to Visakhapatnam, tactical exercises were conducted in the presence of the Flag Officer Commanding-in-Chief of the Eastern Naval Command, VAdm N Krishnan. From Vishakhapatnam, *Vikrant* set out for Madras for maintenance. RAdm SH Sarma was appointed as Flag Officer Commanding Eastern Fleet and arrived at Vishakhapatnam on 14 October. After receiving the reports that Pakistan might launch pre-emptive strikes, maintenance was stopped for another tactical exercise, which was completed during the night of 26-27 October at Vishakhapatnam. *Vikrant* then returned to Madras to resume maintenance. On 01 November, the Eastern Fleet was formally constituted, and on 13 November, all the ships set out for the Andaman and Nicobar Islands. It was planned to sail *Vikrant* to a remote anchorage to avoid misadventures, isolating it from combat. Simultaneously, deception signals would give the impression that *Vikrant* was operating somewhere between Madras and Vishakhapatnam.[7]

Operations during the War

On 23 November, an emergency was declared in Pakistan after a clash between Indian and Pakistani troops in East Pakistan two days earlier. On 02 December, the Eastern Fleet proceeded from the Andaman and Nicobar Islands to its patrol area off the East Pakistan coast in anticipation of an attack by Pakistan. The Pakistan Navy deployed *Ghazi* on 14 November with the explicit goal of targeting and sinking *Vikrant*. *Ghazi* reached a location near Madras by 23 November. In an attempt to deceive the Pakistan Navy and *Ghazi*, India's Naval Headquarters deployed *Rajput* as a decoy - the ship sailed 160 miles off the coast of Vishakhapatnam and broadcast a significant amount of radio traffic, making her appear to be *Vikrant*.[8]

Fig 1: Vikrant's Area of Operations during the War (Inset: Effect of Air Strikes on Chittagong and Cox's Bazar Harbours)

Ghazi, meanwhile, sank off the Visakhapatnam coast under mysterious circumstances. On the night of 03-04 December, a muffled underwater explosion was detected by a coastal battery. A local fisherman observed flotsam near the coast the next morning, causing Indian naval officials to suspect a vessel had sunk off the coast. The next day, a clearance diving team was sent to search the area, and they confirmed that *Ghazi* had sunk in shallow waters.[9]

While the subject of the reason for *Ghazi*'s sinking has remained a matter of much debate, there are three leading possibilities after analysing the rudder's position and the extent of the damage suffered. The first was that *Ghazi* had come up to periscope depth to identify her position and may have seen an anti-submarine vessel that caused her to crash-dive, which in turn may have led her to bury her bow in the bottom. The second possibility is closely related to the first: on the night of the explosion, *Rajput* was on patrol off Visakhapatnam and observed a severe disturbance in the water. Suspecting that it was a submarine, the ship dropped two depth charges on the spot, close to the wreckage. The third possibility was a mishap when *Ghazi* laid mines on the day before hostilities broke out.[10]

Vikrant was redeployed towards Chittagong at the outbreak of hostilities, reaching the area on 04 December. On the same day, the ship's

Sea-Hawks struck shipping in Chittagong and Cox's Bazar harbours, sinking or incapacitating most of the vessels present. With insufficient winds for the launch of Sea Hawks from 06 to 11 December, dawn and night strikes by *Alizés* targeted Khulna, Chalna and the Port of Mongla, which continued until 10 December, while other operations were flown to support a naval blockade of East Pakistan, including anti-shipping strikes against suspected contraband-carrying vessels. In addition, continuous strikes were carried out against the airstrips at Chittagong and Cox's Bazar by the *Alizés*, thereby ensuring air superiority in the area. On 14 December, the Sea-Hawks attacked the cantonment area in Chittagong, destroying several Pakistani army barracks with medium anti-aircraft fire encountered during this strike, while simultaneous attacks by *Alizés* continued on Cox's Bazar. After this, *Vikrant*'s fuel levels dropped to less than 25 per cent, and the aircraft carrier sailed to Paradip for refuelling, thus ending her involvement in the war. Summing up the effects, in addition to the more than 57 thousand tonnes of merchant shipping, PNS *Jessore*, *Comilla* and *Sylhet* were destroyed. The crew of INS *Vikrant* earned two Maha Vir Chakras and twelve Vir Chakras for their part in the war.[11]

Centrality of Aircraft Carriers to India's Maritime Security

Drawing from the non-availability of *Vikrant* during the 1965 War due to refit and her subsequent performance during the 1971 War, Adm SM Nanda had stated, "It is because of the need for every ship and, particularly an aircraft carrier, to undergo periodical repairs and refits lasting several months, that planners have repeatedly recommended that the Indian Navy have at least three aircraft carriers so that *at least* two are operational at all times."[12]

Therefore, there is much rationale for a regional power like India to possess a carrier capability. Even if India could obtain access to extra-territorial air bases for use by its land-based aircraft, it may not be prudent to factor in such bases since these may not be made available on the most critical occasions due to geopolitical factors. With India having joined the elite club of countries capable of building aircraft carriers, it is crucial that the institutional knowledge and infrastructure gained is not squandered through a substantial gap before building the much-needed third aircraft carrier. Further, India's current two carriers face two fundamental limitations, with the first being the 'small-deck quandary,' which would

drastically limit offensive capability after factoring in self-protection and Fleet AD, and the second being the Short Take Off But Arrested Recovery (STOBAR) configuration with its inherent payload limitations *vis-à-vis* Catapult Assisted Take Off But Arrested Recovery (CATOBAR) aircraft launches.[13]

Conclusion

In conclusion, notwithstanding the above limitations, there are numerous possible scenarios, wherein, a carrier capability would be indispensable to India; some of them being: -[14]

- **In Support of Land Battle**. This scenario is evident from the case study discussed above. With substantial parts of India's land borders with its western and northern neighbours remaining disputed, the likelihood of such a scenario is likely to remain. This can be expected as either a direct action to influence affairs on land, such as in support of amphibious operations or through indirect effects at sea that would influence the adversaries' decision cycle in land campaigns.
- **Security of Sea-Lines of Communication (SLOC)**. In the event of a military conflict, a carrier is the only naval asset that can provide comprehensive protection to merchant shipping carrying strategic commodities to India. Due to the ongoing diversification of energy sources away from the Persian Gulf area, these distant SLOCs also assume significance for India.
- **Maintaining Influence in IOR**. India's security is directly linked to and closely enmeshed with that of the Indian Ocean and the adjoining littoral region (IOR) - the area of its primary strategic interest. A possible Chinese politico-military intervention in the region will seriously impinge on India's security. In that sense, a carrier can best bestow on India the capability to maintain its influence in these waters and achieve strategic 'deterrence' against any inimical extra-regional power. It is important to note here, in light of regular assertions from various quarters of an alternative approach or shoring up defences on our island territories to serve as 'unsinkable aircraft carriers, that these island territories would also remain 'immovable aircraft carriers.' This fact leads to the operational influence of any aircraft based on these island territories to remain subject to range limitations that plague shore-based aircraft from the mainland. Notwithstanding any deck size

and aircraft-payload limitations imposed by India's current carrier and aircraft complement, the inherent mobility, reach and flexibility of a Carrier Battle Group and their consequent ability to serve as a 'threat in being' at any location of India's choosing cannot be discounted. In continuation of the discussion on the 1971 War, the effect of the mobile threat posed by an aircraft carrier is further demonstrated by the effect that the prospect of the USS Enterprise Carrier Battle Group entering the Bay of Bengal had on the psyche of all the stakeholders of the war.

- **Safeguarding Vital Interests Overseas**. Carrier aviation will enable India to safeguard its strategic interests overseas in the IOR and beyond. India's economic/strategic stakes are conspicuously increasing in Afro-Asian states, many of which are plagued by political, socio-economic and ethnic instabilities.
- **Security of Island Territories**. Integral naval aviation is essential for the defence of India's far-flung island territories, particularly the Andaman and Nicobar (A&N) Islands, which lie more than 550 nm from the Indian mainland. These islands are also highly vulnerable due to their geographical spread and the fact that most of these are uninhabited. While, the possibility of foreign military occupation or claim may be unlikely in the foreseeable future it cannot be ruled out altogether, as proved by the 1982 Falkland War. The centrality of aircraft carriers to the UK Concept of Operations was proven through the exploits of the Royal Navy Sea Harriers and Royal Air Force Harriers operating from the decks of the Hermes and Illustrious and also through the daring efforts to augment these aircraft using those ferried by the SS *Atlantic Conveyor*. These inherent vulnerabilities further lead to high-value naval/air assets being unlikely to be based in the A&N Islands, thereby further weakening the 'unsinkable aircraft carrier' argument. This makes the aircraft carrier indispensable, even as a deterrent.
- **Non-military Missions**. Although the concept of a carrier is essentially centred on its military role and a non-military role would not naturally flow from this case study, such a platform would substantially increase India's operational options to respond to a natural disaster in the regional seas or littoral. While it has begun inducting large sealift platforms with integral helicopters like the INS *Jalashwa*, a disaster of a large magnitude may necessitate the employment of a carrier. Akin to

a floating city, a carrier can provide virtually unlimited sealift, substantial airlift and all possible essential services ranging from freshwater to electric supply and medical to engineering expertise. The experience gained during the 1971 war could well flag the need for having a minimum of three aircraft battle groups for India to ensure adequate power projection and security provision to its areas of interest.

Cdr Karthik Balaji was commissioned into the Engineering Branch of the Indian Navy on 07 August 2006. He is an Air Engineer Officer qualified on Sea Harrier, Kiran and Hawk Mk 132 aircraft. He is an alumnus of the Defence Services Staff College.

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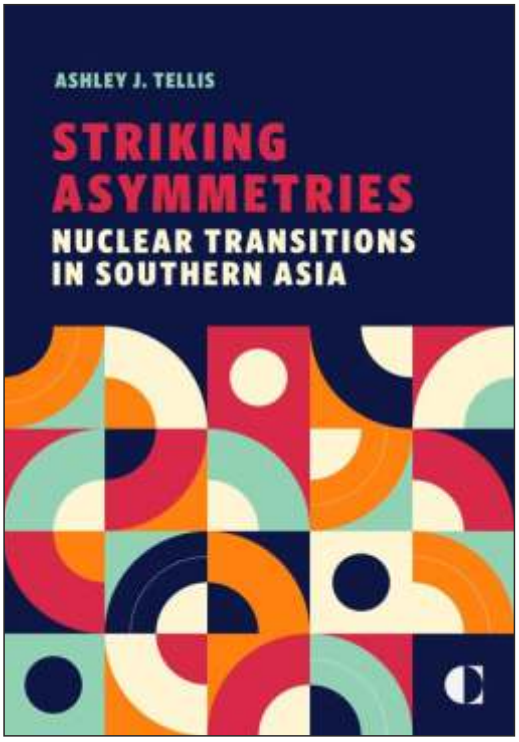
ASIA'S NUCLEAR FISSION

Striking Asymmetries – Nuclear Transitions in Southern Asia
Author: Ashley J. Tellis,
Published by: Carnegie, Endowment for International Peace in 2022,
Number of Pages: 318

Book Review by Commander Ved Prakash

"*Now I am become death, the destroyer of worlds*."
- Bhagavad Gita, quoted by Robert Oppenheimer.



As he witnessed the first detonation of a nuclear weapon on 16 July 1945, the above Hindu scripture line ran through the mind of Robert Oppenheimer, Director of the Manhattan Project and the 'father' of the atom bomb. "We knew the world would not be the same," he later recalled. Nuclear weapons since their use to end WW II, have come a long way from being a Weapon of Mass Destruction (WMD) to being the means of a devastating second strike and therefore, Mutual Assured Destruction (MAD). Nuclear weapons are thus recognised as the ultimate weapon to counter and deter a conventionally superior adversary. Possession of these weapons alone was able to prevent two mutually hostile superpowers from going to war at the peak of Cold War era despite tensions running high on numerous occasions. A sobering fact for world peace is that never have two nuclear-armed countries fought a direct war or entered a direct armed conflict with

each other after acquiring these weapons. However, the situation in South Asia is significantly different, wherein, three nuclear powers (China, India and Pakistan) have fought bitter full-scale and limited wars before and post acquiring nuclear weapons and share potentially turbulent land borders. Against this backdrop, the book *Striking Asymmetries - Nuclear Transitions in Southern Asia* meticulously examines the transient nature of the nuclear balance between China, India, and Pakistan, the three Asian giants with deep-rooted differences. The fact that these three nations are led by different forms of governance and ideology - secular democracy in India, communism in China, and Islam-driven fragile democracy in Pakistan - makes this study even more relevant for all stakeholders.

Striking Asymmetries- Nuclear Transitions in Southern Asia by Ashley J. Tellis, was published in July 2022. This is a diligent scholarly work, coming at a pertinent time when India and China have come to loggerheads in the Galwan Valley and relations between India and Pakistan are simmering post-Pulwama, Uri and Balakot. The book is aptly categorised as a report, exploring great depths of primary source data and first-hand accounts of policymakers, strategic thinkers and academia from the three nations as well as global think tanks. The book examines the nuclear capabilities of three neighbours, and studies not only the declared or perceived nuclear arsenal in quantitative and qualitative (in terms of weapon yield) aspects, but also analyses the delivery systems and precision thereof available with each country. The data and the analysis, however, have to be read with due diligence without discounting the fact that nuclear capabilities are highly guarded national secrets and precise information is seldom available in the open domain. The book, besides customary preliminary and end pages, is divided into four chapters - a chapter each on China, India and Pakistan, and the fourth chapter is devoted to nuclear transitions and strategic stability in Southern Asia.

China

The People's Republic of China (PRC) in the past seventy years has progressed in leaps and bounds to become a global superpower in a true sense. This exponential growth coupled with the disintegration of the erstwhile USSR has pitted China as a direct competitor against the USA for global dominance. As they both jostle for global supremacy economically and diplomatically, their militaries are also getting involved. Thus, China's

nuclear weapons programme is considered a direct counter to the USA in qualitative and quantitative aspects. On the other hand, China's irritation and friction with its neighbour, India are primarily due to the superior geo-strategic location enjoyed by India, which can decisively disrupt Chinese supply lines in the IOR. This can potentially affect the outcome of any conflict in the South China Sea and the Pacific Ocean theatres.

This geo-strategic calculation forces China to cater and to counter any Indian aspirations, which can prove counterproductive to China's rise and her road to supremacy. This fact, mated with unresolved border demarcations force China to keep the borders with India simmering under a relatively calm surface and makes India, a credible challenger to be factored into China's military calculus. China's nuclear weapons programme, as of now, overshadows the Indian arsenal. The author for the foreseeable future sees India as likely to remain content with keeping its nuclear weapons for a credible second-strike capability against China. He also brings out the understanding that India's nuclear doctrine against China is primarily enshrined in the fact that it must hold select Chinese targets at unacceptable risk to discourage any pre-emptive strike by China on its nuclear forces. The chapter dives deep into the development of the Chinese nuclear arsenal and delivery systems. It also analyses the dramatic growth and transformation of China's long-range missile systems targeted primarily at the United States. The book also acknowledges the fact that China is unconstrained, in both legal and physical terms, from expanding its arsenal as it chooses, thus, bringing it at par with the other NPT recognized nuclear-weapon states. This gives it significant advantages over local nuclear rivals such as India.

India

India's Nuclear Doctrine is based on three main pillars, namely No First Use (NFU), Credible Minimum Deterrent (CMD) and Massive Retaliation. The remarkable persistence of strategic conservatism by India has been rightly highlighted by the author as a major influencer on Indian Nuclear doctrine. The author further delves into the two most significant issues in this regard, which are, contemporary deliberations about the viability of its No-First-Use commitment and the wisdom of persisting with its strategy of Massive Retaliation. The NFU posture of India is likely to endure even as the pressure for change may linger. However, the credibility of the NFU policy depends on the survivability of the nuclear arsenal and its command-

and-control systems from a pre-emptive strike by the enemy. Survivability, coupled with Massive Retaliation under the framework of CMD, is thus, the main challenge for India's nuclear strategy. Accordingly, a gradual emphasis on "Credible" over "Minimum" deterrence is evidenced by recent development projects such as Multiple Independently Targetable Re-entry Vehicle (MIRV) warheads, the Shaurya nuclear-capable cruise missile and the (potential) nuclear-capable short-range missiles. The survivability of India's strategic weapons could fluctuate depending on the evolution of adversary surveillance and offensive capabilities and its targeting strategies. These policies may require to be revisited once India's SSBN programme becomes fully operational. The author has hinted towards a need for India to revamp its nuclear programme to match those of potential adversaries. The overall impression about India's nuclear capabilities as brought out in the book, however, is pessimistic at best and needs to be deliberated with due diligence.

Pakistan

The book brings out the policy differences between Pakistan and India on the use of nuclear weapons. The basic aims of the two nations are subtly different; Pakistan seeks to use its nuclear weapons to prevent all forms of conventional war, whereas India seeks to use its nuclear weapons to prevent nuclear threats directed against itself. This asymmetry of objectives seen in the backdrop of Pakistan's attempt to use its nuclear weapons as cover to challenge India through terrorism and other forms of sub-conventional warfare has created an uncertain peace between the two states. Pursuing such a strategy of nuclear coercion by Pakistan has opened the door to Indian threats of conventional military retaliation, which in turn, precipitates the dangers of Pakistan's use of Tactical Nuclear Weapons (TNWs) and further escalation therefrom. The hazards of deterrence instability thus, persist in the case of India and Pakistan as a chronic condition. A few hints on Pakistan's pursuit of TNWs and delivery systems including long-range missiles further complicate the overall dynamics of the nuclear balance between India and Pakistan.

Nuclear Transitions in Southern Asia

The author also examines the relative nuclear strategies and postures of the three South-Asian nuclear powers. He points out that the most important

factor for maintaining strategic stability in the Sino-Indian and Indo-Pakistani dyads is that all three nations view their nuclear weapons as political instruments rather than as warfighting devices. This is the most evident case as far as India is concerned. The significant uncertainty about the location of the others' nuclear reserves mitigates the temptation to attempt any efforts at interdicting them, even in an acute crisis. Although various developments in surveillance technology, data aggregation and analysis, and cyber intrusion and exfiltration could enable one or more of the rivals to learn the locations of their adversary's nuclear reserves. This outcome may lead to false presumptions and an ill-conceived pre-emptive first strike, triggering a response from the other side. Additionally, advancement in area-defence umbrellas and precision striking capability further enhance chances of misunderstandings and miscalculations.

Lest We Should Forget

State and state-sponsored non-state threats on our western frontier remain ever-present. A chronology and frequency of some recent misadventures suggest that a credible deterrent has seldom deterred our neighbour in their infernal resolve of bleeding India through a thousand cuts. All these nefarious acts suggest a misplaced sense of impunity gained by our Western adversary due to the possession of nuclear weapons. How and when (if ever) a miscalculation on the adversary's part can lead to an inadvertent foolish act of using nuclear weapons at a tactical level cannot be judged at this point. But should such a situation arrive, are we truly prepared to defend, and more importantly, are we ready to respond with Massive Retaliation? Or do we adopt a bold stance in advance to deter any such miscalculations and showcase our resolve by demonstrating strategic capabilities using further testing of higher-yield weapons?

As India aspires to rise in the World Order and claim its rightful place at the high table, we cannot be naïve to ignore the growing discomfort of our potential adversaries and not-so-friendly nations. Can this book act as a timely reminder of under-the-carpet issues of our immediate neighbourhood and nudge the leadership to address the proverbial elephant in the room by addressing growing asymmetries in the nuclear field? These are some of the questions adduced in the reader's mind by *Striking Asymmetries - Nuclear Transitions in Southern Asia*.

The book has the potential to wake up policymakers and strategic

thinkers from a slumber of complacency and at the least, initiate debates on the germane future trajectory of India's Strategic Weapons programme. This book is a must read for research scholars involved in PME as well as students pursuing research in nuclear doctrine and disarmament. In this world of 'Striking Asymmetries,' let us not be the mythical Goliath of yore, succumbing to one targeted strike by any (mis)adventurous David.

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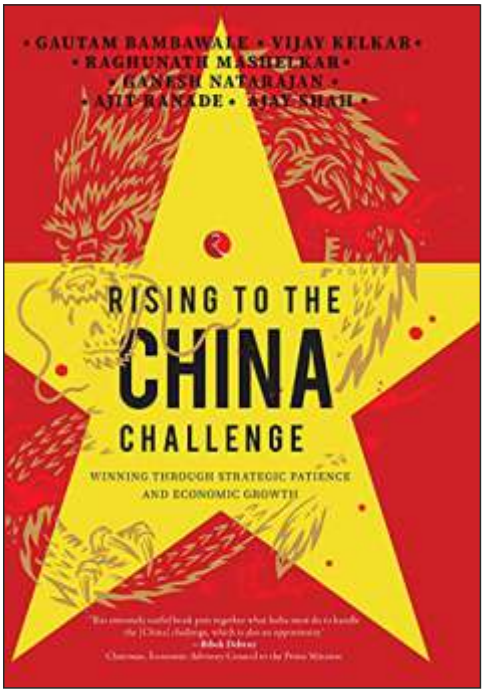
CHINESE CHECKERS

Rising to the China Challenge: Winning through Strategic Patience and Economic Growth
Author: Gautam Bambawale
Published by: Rupa Publications in 2021
ISBN: 9789391256524 Number of Pages: 169

Book Review by Commander Rohan S Soman



Rising to the China Challenge: Winning through Strategic Patience and Economic Growth has been conjointly authored by six former public servants and scholars of unique distinction. The authors are Shri Gautam Bambawale, India's former Ambassador to China; Vijay Kelkar, former Chairman of 13th Finance Commission; Ramesh Mashelkar, Fellow of the Royal Society and former director-general of the Council of Scientific and Industrial Research (CSIR); Shri Ganesh Natarajan, Executive Chairman and founder of 5F World; Shri Ajit Ranade, Group Executive President and Chief Economist at the Aditya Birla Group and Professor Ajay Shah, formerly with the Centre for Monitoring Indian Economy.

This book was published in July 2021 against the backdrop of China's unilateral attempt of redrawing the Line of Actual Control (LAC). China was trying to send a message that India did not matter and that the Twenty-First Century was not going to be an Asian century, but instead would be known as the Chinese century. India demonstrated that it will not accept coercive tactics and will look at the other aspects of the relationships

continuing only if there is tranquillity on the borders. While considerable attention is being paid to a short-term perspective, this book highlights it as a long-term game that is also about economics, science, technology, etc. India can prevail in this long game by mixing a short-term strategy of sophisticated and nimble foreign policy with a long-term strategy of strategic patience along with domestic reforms, which generate high economic growth.

The first two chapters highlight the divergent growth and trade asymmetry between India and China. China's economic reforms, which led to its high and sustained growth, began in 1978. On the other hand, India's push for reforms, which included delicensing of industrial production and reducing barriers to cross-border trade and finance, began in 1991, i.e. with a lag of 13 years. This lag is an important element in the explanation of the imbalance between the two countries that is visible today. Over the last 40 years, since 1980, China's growth rate has been an average of 10 per cent versus seven per cent for India. Thus, despite starting off at similar economic sizes, by 2020, China's economy is five times bigger than that of India. On top of that, there is an ever-increasing trade deficit faced by India. While the Indian market was wide open to Chinese firms as we adhered to WTO regulations, our companies did not enjoy a level playing field in China.

In Chapters 3 and 4, the authors argue that India has an opportunity to become less dependent on China by building core capabilities in key industries, and in some segments, become a global alternative for China. They have focussed their analyses on nine key sectors - Consumer Electronics, Automobiles, Chemicals, Rare Earths, Agriculture, Telecom, Healthcare & Pharma, Scientific Research and Artificial Intelligence (AI). Each of these sectors has been examined in detail, based on data available from open sources. The chapters are rich in visual display of quantitative information in the form of tables, bar graphs and pie charts. Though some of the tables could have been coloured as grayscale becomes difficult to appreciate. Also, it emerges that there is a strong case for all significant universities in the country to have dedicated centres for China studies in order to ensure we understand China better than we have done in the past.

Chapter 5 is aptly titled '*Tryst with a New Destiny*.' View COVID-19, our national goal of a $5 trillion economy set for 2024 would be delayed by at least a couple of years. However, the trillion-dollar Digital India goal can

be achieved a year or so ahead of that. India needs to continue forging comprehensive economic partnerships or Free Trade Agreements (FTA) with more countries. Such initiatives would help improve the resilience of global supply chains. There is an urgent need to address a common complaint that while policies are announced, these are not effectively implemented and the approach of bureaucracy is one that creates delays and obstacles rather than support. Towards this, our politicians and civil servants will have to demonstrate a sense of urgency to make *Atmanirbharta* and 'Vocal for Local' move from the realm of being just smart pithy slogans to real action on the ground.

The next chapter deals with countering China's wolf-warrior diplomacy. China sees the world as being shaped by force and hard power, not debate, discussion and diplomacy. Upon that, China desires to spread its own political and economic system to other parts of the globe. Even as China is continuing its forward-looking posture in the South China Sea, it is attempting military coercion on its border with India and is upping the ante in the Senkaku Islands with Japan. Simultaneously, its aggression against its own people in Hong Kong and Xinjiang continues unabated and with no concern for the views of the international community. China wants majority of countries to adopt Chinese technology and standards as she pushes for infrastructure projects that eventually become debt traps. By 2030, China will have more warships than India and the US put together with a capacity to challenge us in our own backyard - the Indian Ocean. If India does not build up a comparable naval capability, there can be a scenario of a naval blockade. This should serve as a wake-up call to our policymakers in MoD and the Navy as China will continue to use its economic and military might as a coercive tool in the coming years.

The last chapter proposes a number of policy recommendations. First, the authors caution against viewing the problems of 2017 and 2020 as short-term tactical problems. India must take a long view of the conflict with China, combining short-term solutions with a strategic perspective of it being a contest of two rival systems for organising society. India must emerge as a strong market economy located in a liberal democracy. India needs to collaborate with three categories of countries in the world - great democracies, countries sharing borders with China and nations in our neighbourhood. The collaboration must encompass economic, military and intelligence-sharing aspects. Relations with these groups would be

transactional and would require us to cede grounds on issues, which are a priority to our partners, for e.g. climate change, civil liberties, autarky and nationalism and in return, ask for support in the conflict with China. Three important domestic problems need to be tackled - excessive government interference in the economy, the emergence of an 'administrative state' with a concentration of power in the executive and upholding the rule of law.

In areas of high import dependence on China, alternative sourcing needs to be achieved. There is a need to construct regulations, which require private importers to hold at least six months of inventory. This would reduce the extent to which China might be able to disrupt the Indian economy by withholding supplies. Chinese firms have links to the Chinese state. Computer hardware from China has often been seen to have espionage backdoors. An important aspect is harnessing the potential of 5G without depending on Chinese hardware and protocols. It is thus important to block Chinese equipment from the telecom and internet infrastructure of our country. One of the recommendations in the book is building the Indian Rupee (INR) as an international currency. Towards this, the RBI recently has allowed traders to trade in INR instead of the US Dollar. While more details on this are yet to be made public, this could be a game changer.

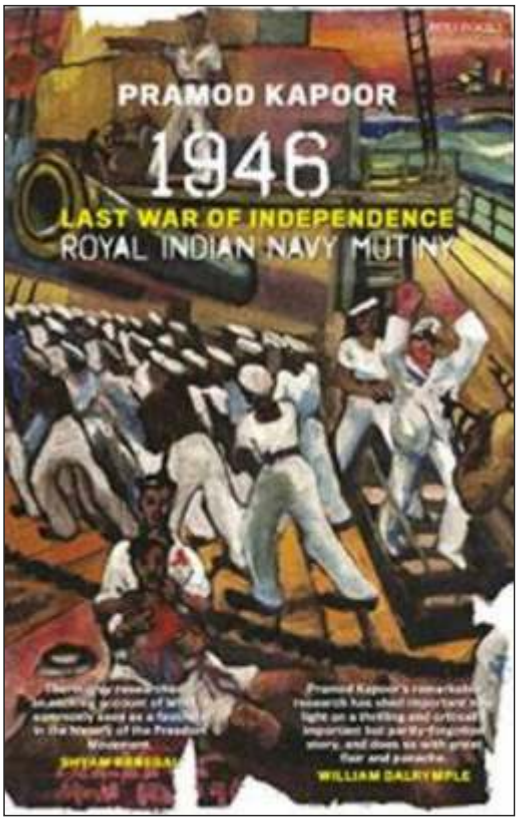
This book illustrates how military power grows out of the economy and concludes that persistent divergence between Chinese and Indian GDP is the foundation of India's China problem. Discussion on China and India often tends to be conducted in terms of International Relations (IR) and military affairs. However, this book calls for making a distinction between short-term and long-term objectives. When dealing with small amounts of space, time and force, practical decision-making in IR and military affairs becomes important. However, India's China question will be played out on a longer time horizon. Our strategic thinking must encompass economics, finance, technical and cultural prowess. The book is an easy read and is recommended reading for all policymakers in our security apparatus, at large, and China watchers.

Cdr Rohan Shireesh Soman is an alumnus of the 20th Naval Engineering Course. His educational qualifications include MTech in Control System Engineering from IIT Kharagpur and Graduate Certificate of Public Policy (Defence & Foreign Affairs) from Takshashila Institution.

MUTINY OR FIGHT FOR FREEDOM

1946 - Last War of Independence, Royal Indian Navy Mutiny
Author: Pramod Kapoor,
Published by: Roli Books Pvt Ltd. in 2022
ISBN: 9789392130274 Number of Pages: 359

Book Review by Captain M Doraibabu



One man's notion of mutiny is another man's fight for freedom. The Royal Indian Navy Mutiny of February 1946 was one of the last major uprisings against British colonial rule spreading across the length and breadth of pre-independent India. For such a momentous and largescale movement that saw over 400 fatalities, had alarms ringing in the British Parliament and had caught attention of the senior-most political leaders of the time, it was relegated to minor references in India's struggle for freedom. The uprising, technically a mutiny in strict terms of uniformed service akin to the rebellion of Sepoys in 1857 if one may arguably say so, lasted for just four days. Though the spark was lit in a naval unit, the HMIS *Talwar* (now a Naval Transport Pool) at Mumbai, it spread like a hurricane from down south at Kochi to the shores of Karachi in the northwest in the matter of a day. Although named the Royal Indian Naval Mutiny, the rebellion not only involved sailors of the RIN but also mill workers of Bombay, students, members of the Communist Party and thousands of common civilians

caught up in the fervour for achieving complete Independence. The public unrest majorly occurred in Karachi, Vishakhapatnam, Madras, Calcutta, Ahmedabad, Trichinopoly, Madurai, Kanpur and elsewhere. For an event of this proportion, very little knowledge of it is prevalent in the public domain other than a few historical archives and even fewer historians. The Indian Navy epitomizes the uprising with a museum cum memorial and naming of naval auxiliaries after the main actors in the mutiny.

1946 - Last War of Independence, Royal Indian Naval Mutiny by Pramod Kapoor is a well-researched and anecdotal recount of the events that occurred over the four days of the mutiny. Pramod Kapoor is the founder and publisher of Roli Books and has over the course of his career conceived, authored and published many award-winning books. It was while researching for one of his books *Gandhi: An Illustrated Biography* that he came upon references to the 1946 Uprising that caught his interest and resulted in this book.

As the author states, while researching the subject, he could access hundreds of documents, reports and correspondence by British Officers of the RIN and the Home Office in London, which detailed the British view of the incident. The author then persevered to meet the protagonists of the uprising itself or their closest relatives to get a first-hand account of the mutineers themselves. This particular aspect of the book gives the reader a complete bird's eye view of the occurrence with no bias to any particular side or political leaning. The author has also visited the sites of the mutiny to get a feel of the environment that would have prevailed at that time. The overall effect has been that the book is an interesting amalgam of views and counterviews of all concerned transporting the reader to the very streets of erstwhile Bombay when the event was unfolding.

On 18 February 1946, Indian sailors posted at HMIS *Talwar*, a Signal School then, struck work protesting the uncouth behaviour of their British Commanding Officer when they raised complaints of inedible food, racial discrimination and wretched conditions of service. Given the highly inflammable atmosphere prevailing across the land due to the public trials of *Azad Hind Fauj* prisoners, the strike by the sailors was like lighting a fuse to a keg of gunpowder. The protest exploded to involve 78 ships, 21 shore establishments and over 20,000 ratings who in just 48 hours brought one of the most formidable navies of the time to a standstill. Over three lakh civilian protestors took up the call of the sailors and revolted in the streets of

Bombay forcing the British administration to roll out armoured tanks to quell the rebellion. Politicians soon became involved in the mutiny with varied vested interests. The Union Jack flying on the ships were hauled down and the tricolour of the Congress, the green flag of the Muslim League and the red flag of the Communist Party were entwined and hoisted over ships and establishments. The author brings out the fact that the mutiny was never limited only to the Royal Indian Navy since demands of the Central Strike Committee included political demands of freeing *Azad Hind Fauj* prisoners, inquiry into firings all over India and withdrawal of Indian troops from Indonesia and the Middle East making the mutiny more political and nationalistic in fervour.

For all the conflagration that the uprising created, the author finds that a lack of political support from the stalwarts of the freedom struggle of India forced the surrender of the mutineers who were then incarcerated and dismissed from the RIN despite promises of no action against them. Even after Independence, successive governments of India and Pakistan refused to re-employ the dismissed personnel involved in the mutiny or even recognise them as freedom fighters up to 1973 in India. Instead of being talked about in the same breath as the Salt March or Jallianwala Bagh, there seemed to be an institutional effort to banish this event from the annals of history to the sidelines. This book fills the void by bringing it back to the notice of the public. History debatably states that the naval mutiny largely influenced the British decision of pulling out of India since they could no longer rely on the very troops that valiantly fought for them in World War II.

The book intersperses the storyline of the mutiny with pre-colonial maritime history, the brief profiles and memoirs of the central characters, the involvement of the Royal Indian Air Force and Army and political hues. The first-hand media reports covering the whole incident of just four days is described in a timeline of crucial hours keeping the reader engrossed in the book. The book fills in the knowledge gaps and more than adequately completes the whole story behind the episode for people who are superficially aware of the incident. For example, it brings out the fact that the strike at HMIS *Talwar* was instigated by political actors taking advantage of the simmering tensions among the sailors. Though largely known as the Naval Mutiny, it had also prompted about 1700 airmen in Bombay and a Naik slapped back his British CO when slapped in an army unit at Calcutta. Such unknown threads of researched trivia are also found in

the book.

The book has been a bestseller since its release and is a definite read for everyone. It is written with a fluid flow of thought and language making it easy for the lay reader to grasp the nuances of naval culture. It is available online and also in bookstores for purchase.

Capt M Doraibabu, NM was commissioned on 01 July 97. He has done his specialisation in Communication and Electronic Warfare and is an alumni of DSSC, Wellington. He completed his Higher Command Course from College of Air Warfare, Secunderabad and is a team member of the Naval History Project 2011 - 2020.

OFTEN FORGOTTEN - THE AIM OF ASW

Commodore Neriamparampil Anil Jose Joseph (Retd)

Most people when queried on the aim of ASW tend to answer "To Seek, To Classify, To Destroy." This is the motto and not the aim. The aim of Anti-Submarine Warfare is '**To deny the enemy the effective use of his Submarines**.'

The aim is very clear. For then, Anti-Submarine Warfare would also involve not allowing the enemy to have a submarine; preventing the submarine from sailing out; having sailed out ensuring that the submarine is out of action or out of the equation completely and so on. This may all sound unwarrior-like very passive, very defensive and very unglamorous. Hence, the evolution of a more aggressive motto, which people tend to confuse or associate with the aim.

ASW is a branch of underwater warfare and ideally, most people will agree that it should be called Undersea Warfare for the term 'Anti-Submariner' just does not sound right. For one, Submariners too do Anti-Submarine Warfare Courses and more importantly, no one dislikes the submariner; one respects one's adversary. It is an art that both are engaged

in and 'Undersea Warfare' has the right ring.

The old name for ASW in our Navy was Torpedo & Anti-Submarine and the officers were referred to as TASO. Colloquially, one joked about TAS as the 'Thomas-Antony-Subramaniam' School for the plethora of officers and ratings, particularly as the UC ratings in this field were from 'God's own Country' and near about. Even today, the banter is that ASW is for 'Antony-Subramaniam-William.' It is an amazing coincidence that till recent years the majority of officers and especially, the UC ratings, were from the South (particularly Kerala and Tamil Nadu). Likewise, one did have a *Malayalee* flavour among the communication ratings, a *Jat* flavour in the Diving branch etc. This has since blurred and there is a larger homogenous mix now but the banter remains.

ASW is different from other forms of Warfare, for the tactics involve a lot of 'mind games' involving a lot of manoeuvring, positioning and long periods of supposed inactivity. We often jest that actual tactics are in ASW and all the rest is closer to being drill or procedure-oriented. There is some element of truth in the banter, for a lot depends on the mind of the Commanders at sea, both the hunter and the hunted. The hunter and the hunted can be a ship or submarine or aircraft and the roles can reverse very quickly. One part of ASW covers preventing and avoiding the encounter itself. There are a large number of options that sound not too glamorous but are important nonetheless.

Any ASWO, or 'Pings' as he is colloquially referred to, knows that the initial advantage rests with the submarine. It is a 'given;' the medium they operate in is such and the way the sound waves propagate, the submarines benefit immensely. Simplistically put, submarines will be quiet and in listening mode whilst the ship has to make her way through the water.

The game starts after that. What does the Submarine do after the initial detection of the target? How does the boat move into position to engage the ship? Does the Submarine Commander have a choice not to manoeuvre? If he manoeuvres, what are the chances of being detected by the ship? When he manoeuvres, the probability of detection increases and a cat-and-mouse game begins even if the mouse (an unlikely term for a ship) is unaware of the stalker. The stalker has to be prepared that the chances of detection are increasing when he begins his manoeuvre. Herein, we have not yet factored in Air ASW, for the submarine may not know where the next dunk could come or whether there are sonobuoys or other modes of detection ongoing.

It takes but a moment for the situation to change, and for the roles to reverse.

The Submarine Commander has to decide whether to go in for the kill in this uncertain environment. His advantage is stealth and surprise, and that advantage could disappear in a moment. After weighing all the options, the Submarine Commander then takes the call to commence the attack. To be effective he has to first get into a firing position. The first preference for a boat will be the torpedo, a subject for another debate for some but agreed to by most specialists. Once the boat has fired or when firing, the boat has to assume that its position has been compromised and that the boat would need to take evasive measures. This presents a different challenge to the Submarine Commander and I am sure most will be willing to take on the challenge and accept the risk. That is how all of us are trained. But it's a challenge nevertheless.

Now, what can ships do? Without getting into details, if a ship is alone she is severely challenged, vulnerable and at extreme risk of being attacked and re-attacked. Of course, high speed, evasive measures and manoeuvres etc. are available and are fairly effective too. Ships in formation do provide greater protection and here, the challenge to the Submarine is more, for then the boat has to be mentally prepared that she is going to be under severe attack after her first action.

We have not even talked of the elaborate manoeuvres that the boat has to do to get the Fire Control Solution (FCS) to be in a position to fire. This is an important aspect to understand and every specialist, particularly ASWOs, must go through the process to understand the challenges. ASWOs must have enough sailing time on submarines. I have been lucky that I have more than 25 days at sea on submarines (courtesy of my Commanding Officers).

Since the submarine generally operates in the passive mode, she has to manoeuvre to obtain the Target Motion Parameters (TMP), obtain an FCS and get into a position to fire. Considering the slower speed of the conventional Submarines, the challenge is even more. Now consider that the boat moves into position and precisely at that moment the ship manoeuvres out (zig zag's, alters course, etc. that is any of the submarine evasive measures). It may well be nigh impossible for the Submarine Commander to get a favourable position again. The opportunity would be lost and she would be left out of battle or it can also be that the ship alters course into a waiting Submarine, and the Submarine Commander has to be prepared for this too and seize the opportunity.

While engaging ships in formation, the Submarine Commander has more to think about. A lot depends on the 'mind of the Commander' as well and while it is different for different individuals, in situations like this, one would tend to assume and believe that every Commander at sea, be it on a boat or a ship would be willing to take on the challenges. And needless to say, accept the risk.

And now add this - Air ASW, radar transmissions to keep the boat down, Dunking Sonar, Sonobuoy Fields, PTAS ships, MAD, satellites and other forms of detection including EW. All this makes the art of Anti-Submarine Warfare so interesting that the possibilities and options are tremendous with a lot of variables, thrown in. More importantly, it forces the Submarine Commander to think like the adversary. What will the other man do in this situation? Can we guess that? Can we know that? How do we train for it?

To be able to think like the adversary one has to put himself in his shoes. So, surface ship ASWOs must sail on Submarines and Submariners on surface ships to understand perspectives, and to experience them; for only then will one evolve as an Under-Sea Warfare Specialist.

Our exercises and training are well structured and we need to evolve to add more realism to them. This can happen through discussions with each other and using the opportunity to fine-tune the exercises. Say during a Coordinated Anti-Submarine Exercise No. A17 (CASEX A17) when the submarine penetrates the screen and has an FCS, she pings on her sonar when she is about to fire the torpedo. This makes the sonar operator on the ship a little more alert and brings in an element of realism.

As Commanding Officer of INS *Ranjit*, I was the senior-most ASW Specialist in the Eastern Fleet and later, as Fleet Operations Officer (FOO), we evolved several exercises. Briefing and debriefing were attended by the practitioners to evolve and understand each other's perspectives. We instituted the mechanism of 'On the Spot Analysis' post a CASEX and detailed debrief purely dedicated to ASW aspects only between practitioners of the art (i.e. Submariners and ASWOs).

These debriefs were carried out away from the Fleet glare purely by the practitioners, had a great learning value (the younger officers interacted more freely) and the discussions led to other ways of getting more value from the exercise. For example, the submarine giving a 'ping' when she had an FCS, or firing an SSE at a pre-described time and so on. Eventually, it is not Blue vs Blue but Blue vs Red and all exponents in this 'cat and mouse'

game need to get the best value out of the exercises.

A Submariner gets sufficient exposure onboard a surface ship (in his formative years and some submariners are also posted as ASWOs on surface ships post-specialisation). But for a surface ship ASWO to perceive the submariners' psyche and challenges, one has to go out of the way to train and develop this understanding. A day's sortie on a submarine does not help and it should be participation in tactical exercises to understand the processes/ challenges of submarine operations.

Later as FOO, I continued this practice of debriefing and interaction and we went a step further by having Fleet Captains who were submariners explain the nuances to young ASWOs. If the ASWO could not sail on a submarine, we had Commanding Officers of Submarines in refit/AMP sail on a surface ship to explain to the young ASWO what a Submariner would do at that time. These interactions and discussions were very productive and led to a better understanding and appreciation of each other. During my period as FOO, we also enjoyed some wonderful exercises with our nuclear submarine and there were plenty of lessons learnt with which we could rework tactics and plans. These interactions and professional discussions in our Navy have been mostly dependent on personalities and the rapport one enjoyed with each other. The corollary to this is that if a young ASWO, a submariner or any practitioner of any art for that matter engaged in such professional interaction and discussions, the necessary rapport would develop, which would become a natural process in the later years.

In conclusion, there are many challenges in undersea warfare and the 'psyche' and 'mind' of the Commander plays a very crucial job in the progress of operations. There are bound to be long periods of 'inactivity' followed by short periods of intense activity. Undersea warfare is an art that no one can claim to have perfected and needs continuous training and interaction between the 'hunter' and the 'hunted' due to the dynamic and complex operating environment. The saying 'the more you sweat in peace the less you will bleed in war' would be very apt for the practitioners of undersea warfare.

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NOTE TO CONTRIBUTORS

This page from the editorial board of the *INDES* is to share just a few outline thoughts and for the general understanding of readers who may wish to write for the journal and encourage others to consider doing so as well.

In a manner of speaking, the journal, would be a mixture of a few long essays/ papers, most of which will be peer-reviewed and a few shorter articles, as well as other sections. In that sense, it is conceived to be an amalgamation of a professional naval journal as well as a professional naval magazine. We encourage original, unpublished papers and articles as contributions. However, exceptions can be made for a few previously published articles depending upon the educational and thematic value they bring to readers. Where necessary, such authors may also obtain permission from the copyright holder and *INDES* will acknowledge these details.

For a new periodical, the initial print runs are considerably large and we expect readership to grow. The editorial board will evolve and share details of a few regular sections in the *INDES* and this would include a forum for reader's comments and discussions including responses from authors to enable useful, professional discussions. As in the case of all articles, the editors shall oversee editorial corrections and moderation as necessary for brevity, clarity, propriety and prudent information security.

We have formulated a comprehensive writing guideline to include submission details, style sheet, formats and method of e-file titles to enable handling ease. These comprehensive writing guidelines have been uploaded on the Indian Naval Despatch Foundation website *www.indesfoundation.in* and are accessible across the board for all.

In any case, if there are any queries, the editorial team is at hand to assist. We are available at *contactus@indesfoundation.in* and it will be our pleasure to respond to your queries, critique and suggestions.

LIGHTING MARITIME THOUGHT

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