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An Indian Military in Transformation?

EDITORS **PUSHAN DAS & HARSH V. PANT**

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1 CHINA'S MILITARY RISE AND THE INDIAN CHALLENGE

HARSH V. PANT & PUSHAN DAS

The 19th Congress of Chinese Communist Party (CCP), arguably the most significant political event in China, marked the emergence of Chinese President Xi Jinping as an undisputed leader of China who asserted his authority and leadership in the party to the extent that he has become the first CCP leader to have his contribution attached to his name when Congress unanimously approved incorporation of Xi's ideological contribution into the Party Constitution as 'Xi Jinping's Thought on Socialism with Chinese Characteristics for a New Era'.

The content and the tenor of the address reaffirmed emphatically that China will continue to be more assertive in advancing its interest with an integrated 'soft and hard power approach'. As Xi charted for China a roadmap for the future, he did so by contextualising China's global standing at a time when America seems to have become more inward looking and the global balance of power is undergoing a dramatic transition. His address, though largely focussed on domestic gains and achievements, was also a manifesto for China where he attempted to integrate both normative and ideational components, which he summed as 'Chinese Dream', and the hard power to realise the goals he has set out for China. China's military modernisation and reforms are intrinsic to its goals of expanding its political and economic footprint across the globe, presenting a strategic challenge to India.

At the heart of Xi's vision for China's future was a two-stage plan he has put forward to achieve China's second centennial goal of becoming a "fully developed nation" by 2049—the 100th anniversary of the founding of the People's Republic. The first stage—from 2020 to 2035—aims at domestic transformation by realising the 'socialist modernisation'. The socialist modernisation, he has reiterated would be modelled on socialism with Chinese characteristics. The second stage—from 2035 to 2045—aims for a more global agenda to become "a global leader in terms of comprehensive national power and international influence". This

two-pronged vision, that sums up broadly as the 'Chinese Dream', was packaged as a panacea to all the Chinese problems, a remedy which can be exported by him to other parts of the world.

A critical feature of his address was the centrality of the role of CCP in its overall political system. He asserted that "the defining feature of socialism with Chinese characteristics is the leadership of the Communist Party of China; the greatest strength of the system of socialism with Chinese characteristics is the leadership of the Communist Party of China; the Party is the highest force for political leadership". In other words, he hinted that there will be no substantial political reforms and the nature of one-party political system will be more or less retained.

China's disapproval for 'western models of liberal democracy' is not new and Xi's address attested the disapproval. What was significant was the conscious attempt made by Xi to export what could be termed as the 'Chinese model of governance' to other developing countries. Moreover, it "offers Chinese wisdom and a Chinese approach to solving the problems facing mankind". The fact that China was not just confronting the 'West' on its own but now was ready to provide the 'Chinese alternative' came out emphatically from the address. This was a prominent ideational angle of China's 'international ambitions'.

Though Xi had attempted to project himself as a responsible leader and China as a responsible global by power participating in various multi-lateral forums, China under Xi has displayed periodic proclivity in confronting the established international rules and norms and existing security arrangement when it adversely affected its interest. China's rejection of the United Nations Convention on the Law of the Sea (UNCLOS) tribunal's ruling in the South China Sea was an excellent example of a belligerent China flouting international norms to suit its interest. This selective approval of international norms by China suggested that Beijing would respect the present order only to the extent that it suits its interests and would further re-order it that could satisfy its goal.

China's military modernisation was a significant highlight of Xi's address to the Congress as was the employment of hard power with the aim to realise domestic ideological goals initially, and then to further export it globally. Xi's emphasis on Chinese People's Liberation Army (PLA) and the military might, in his entire speech, unambiguously conveyed the significant role he attributed to the Chinese military. He announced that the PLA's focus will be on realisation of the 'Chinese Dream' for which it must develop "a new military strategy under the new situation" while national defence and military modernisation will be promoted. Xi assured that "by the end of the first stage in 2035, modernisation of our national defence and our forces will be basically completed"; and by the time the second stage comes to a full, China will be "fully transformed into a first-tier force". This ambitious build up plan is undoubtedly intended to make China a full military power, observing directly that the "military is built to fight" and that it should concentrate on "winning wars".

The Geopolitics of China's Militaristic Rise

China's rise has supported a decade of sustained growth in Asia, but also placed unprecedented stress on the global balance of power and security order. Beijing's modernisation of the PLA over the past two decades, coupled with its attempt to change the status quo in Asia's strategic fault lines, has brought China to the forefront of any discussion on India's ability to defend itself and its interests.

Notwithstanding its intentions, China's rapid rise and its growing military profile has suddenly transformed the threat matrix for India. China's economic transformation has given it the capability to emerge as a major military power. In 2017, Beijing's total defence budget for the year was $152 billion, up from $146 billion the previous year, an increase of 7 per cent. And this is when vital elements of the Chinese military build-up, including cyber warfare and space capabilities (as well as foreign procurement) were not included in the announced budget. The bulk of the increased defence spending will go to the Chinese Navy, Air Force and the Second Artillery Corps, which runs the strategic nuclear forces.

This unprecedented military rise of China has created a unique geopolitical situation for India. For the first time in its independent history, the emergence of a great military power at its immediate frontiers now appears imminent. Both during the times of British India and the Cold War, India remained relatively insulated from the security and foreign policy challenges of being a 'great power neighbour' because of its geography as well as the existence of territorial buffer zones. China's march towards being a great power and the ongoing transition of power in Asia has punctured that sense of relative security—unlike other great powers of the past New Delhi has encountered, China impinges directly on India's geopolitical landscape in multiple ways. The rise of China has only exacerbated its intensity.

First, the Sino-Indian border dispute continues to fester.[1] India-China border dispute is not only the largest territorial dispute in Asia but is also one of longest running conflicts in the history of Post-World War II Asian politics.[2] The two nations sharing a 2520-mile-long border are embroiled in a contest for over 47,000 sq mile of Himalayan territory. In October 1962, they fought a war across the Himalayan frontier in which India was comprehensively defeated. But even after 50 years of the border war, India and China have not been able to amicably resolve the dispute. Negotiations on the border dispute did begin in 1981 at vice-ministerial level and a total of eight rounds of bilateral meetings took place until 1987. In 1988, a Joint Working Group (JWG) was constituted to expedite the resolution of the conflict. By 2003, the JWG had met 14 times. In 2003, special representatives were appointed by the two governments "to explore from the political perspective of the overall bilateral relationship the framework of a boundary dispute". Fifteen rounds of talks have taken place between the special representatives so far. If, on one hand, there is an increasing feeling in India that negotiations have dragged for too long, frequent and strident Chinese

claims about the Line of Actual Control in India's Northern sector of Ladakh and its North East have become a norm rather than an exception. The year 2017 was an exceptional year in India-China confrontation on the border as it suggested that not only the dispute is becoming intense but also expanding. The recent Doklam standoff represents the first confrontation between the two Asian giants in this area of the Himalayas since the clashes at Nathu La and Cho La in 1967. The Doklam standoff was unique, it revolved around territory disputed between China and Bhutan, and not China and India. The Indo-Sino border in this sector had been bereft of any major incidents and relatively quiet since the alignment of the Sino-Indian border in Sikkim is broadly accepted by both sides. But it now seems that the location of the disputed China-India-Bhutan trijunction border will likely remain a source of contention in the years ahead.

Second, the China-Pakistan 'axis' has always been a source of great consternation for New Delhi.[3] This nexus between Islamabad and Beijing has only grown stronger in recent years. Not surprisingly, recent revelations about China's shift away from a three-decade-old cautious approach on Jammu and Kashmir, its increasing military presence in Pakistan, planning infrastructure linking Xinjiang and Gwadar, issuing stapled visas to residents of Jammu and Kashmir, and supplying nuclear reactors to Pakistan—all confirm a new intensity behind China's old strategy of using Pakistan to secure its interests in the region.[4] The real concern for India however is the number of projects that China has undertaken in these areas; and that footprint is likely to increase much larger.[5] Meanwhile, America's relative decline and the prospective withdrawal of forces from Afghanistan has only tightened the strategic embrace between these 'all-weather friends'. India's "strategic encirclement", which began in 1960s, only appears to be gaining momentum with China's rise. Billions of Chinese dollars now being invested in the China-Pakistan Economic Corridor (CPEC) suggest that this encirclement will continue to strengthen.

Third, strategic encirclement from the North has now been accompanied by a maritime encirclement. For the first five decades of India's independence, her geographical advantage in the Indian Ocean and its limited interests in the East facilitated her lackadaisical approach to maritime security in the Indo-Pacific region. China's forays into the Indian Ocean has left New Delhi concerned with the shifting maritime balance of power. In the last one decade, China has developed naval facilities in Myanmar, Sri Lanka and Pakistan; and is even planning to build naval infrastructure in Seychelles.[6] Though the Indian National Security Advisor has tried to allay the fears engendered by the "string of pearls" theory, the Indian strategic community remains wary of China's ultimate intentions.[7] Indian Navy is particularly alarmed by China's growing naval presence in the region.[8] China's anti-piracy operations in Gulf of Aden and other out of area operations have also raised hackles in India. But the rivalry also extends to waters beyond Malacca. If for China, Indian Ocean is not an Indian lake, New Delhi's imperative is to contest impressions in Beijing that the waters east of Malacca automatically fall under latter's

sphere of influence. India's naval engagement in the East, therefore, has also been a reaction to China's expansion in the Indian Ocean Region. The turf war between the two navies, as both nations further prosper and seek greater role in regional dynamics, is only set to grow.

Geopolitical frictions notwithstanding, Beijing is also extremely reluctant to accept India's rise in the international system and to accommodate India in global regimes and institutions as an equal. China remains the only major power in the world that refuses to discuss nuclear issues with India for fear that this might imply a de facto recognition of India's status as a nuclear power. It continues to insist on the sanctity of the UN resolution 1172, which calls for India (and Pakistan) to give up its nuclear weapons programme and join the Nuclear Non-Proliferation Treaty (NPT) as a non-nuclear weapon state.[9] A large section of China's political and military elite views India's nuclear tests in 1998 not as an attempt by India to address its security concerns but rather an attempt by the US to contain China in so far as the US 'allowed' India to go nuclear.[10] China's reluctance to accept New Delhi as a nuclear power was also evident in its efforts to scuttle the Indo-US nuclear deal at the Nuclear Suppliers Group (NSG) in 2008. Though, under American pressure, China hesitatingly agreed to the India-specific exemption at the NSG, it has in recent years repeatedly tried to sabotage India's efforts to join the multilateral grouping, which controls the global trade in nuclear material and technology. However, this is also reflective of China's long-held view against India's inclusion in the United Nations Security Council (UNSC). Except China, all other veto wielding P-5 nations have in principal accepted India's candidature as a permanent member of the UNSC. Beijing however has constantly tried to undermine this consensus by putting extraneous conditions on UNSC's expansion.

Therefore, managing China's rise is a security and foreign policy priority for India. However, the question of 'how should India manage China's rise' brooks no easy answers. The debates around this issue are highly variegated. More so because the current transition of power in Asia has presented India with stark choices, a situation which New Delhi's political elites have long wanted to avoid. That avoidance seems no longer possible as the military implications of China's rise are fast becoming apparent. The 73-day Doklam standoff between the militaries of India and China in 2017 brought this challenge into sharp relief. Understanding the change in Chinese military posture is now an imperative that can no longer be avoided.

Changing Doctrine and Capabilities of Chinese Military

Since the 1990s, the PLA and its supporting air and naval arms have made impressive strides. Two events played a catalytic role in modernising the Chinese military of today—the first was the Persian Gulf War of 1990-91 and the second was the Taiwan Straits Crisis of 1995-1996. The first event is most pertinent for China's quest to acquire the strength and flexibility to execute combined arms warfare. A centralised military command structure for most of PLA's history was much too inflexible and unsuited for the conduct of future wars. This has undergone a

significant shift since 2015 with the introduction military reforms by President Xi Jinping. In this regard, China has made good on the relative tranquillity it has enjoyed since late 1970s and developed a range of conventional capabilities. The consequence of this modernisation is greater assertiveness in regional disputes.

Massive military expenditures sustained by Chinese economy in the last 15 years have allowed the PLA a fair amount of defence modernisation, accumulating capabilities which are generally associated with the revolution in military affairs.[11] Consequent doctrinal changes accompanied Chinese military thinking with its emphasis on "local wars under informationalisation".[12] Elsa Kania argues in her chapter that the PLA has made a focussed attempt for the advancement of new forces and capabilities for information warfare. In particular, the restructuring and integration of Chinese space, cyber, electronic, and psychological warfare capabilities to create the Strategic Support Force. Additionally, the focus on mobility has allowed China to operationalise its military doctrine of "revitalised war zone strategy" in which her enormous reserves could be forced into action at very short intervals.[13] This strategy is combined with doctrinal precept of "active defence", embodying pre-emptive military strikes with "superior concentration of firepower" in order to "destroy the opponent's retaliatory capability".[14]

Alongside these doctrinal changes, the PLA is now going full steam ahead with technological force modernisation so that China can successfully pursue a military campaign that meets the demands of 21st century warfare. PLA's ground combat equipment has improved tremendously and it now fields a variety of capabilities.[15] Richard A. Bitzinger's chapter covers the wide gamut of capabilities that the PLA has accrued over the years and its impact on Chinese assertiveness.

If the PLA has undergone massive transitions, the People's Liberation Army Air Force (PLAAF), too, has witnessed significant improvements in its capabilities through investments in tactical aviation. Changes in the PLAAF's fighter fleet have been evident since the 1990s. The Chinese Air Force started acquiring a small number of fourth-generation fighters in 1996. Since the mid-1990s, and for a decade and a half thereafter, the PLAAF's numbers swelled to 30 percent of the force. By 2015, the size increased to roughly 51 percent of the fighter fleet of the PLAAF and will grow further to 62 percent by the current year.[16] An estimate notes that the Chinese fourth-generation fighter fleet increased from 383 to 736 jets between 2010 to 2015, representing a 92 percent jump in fighter air combat power.[17] Today, China operates roughly 1,200 short-range fighters.

Operationally active in the PLAAF's fleet are approximately 400 J-7 fighters, a reasonably effective aircraft. Yet the J-7 fighter strength will decrease in numbers, replaced with more advanced fourth-generation jets. The PLAAF's current fleet strength stands at approximately 1977 aircraft.[18] It is also driven to developing stealth capabilities for a segment of its fighter fleet, testing a number of J-20A operationally

and undertaking flight tests of a second stealth type in the form of the J-31. Stealth technology will be core component in the transformation of the PLAAF from a predominantly territorial airforce to one conducting both defensive and offensive operations. The induction of the J-20 A will present a fundamentally different threat compared to the Russian Sukhoi 27/30 derivates that form the mainstay of Chinese airpower. While the size of the Chinese Air Force is important, the strength of the PLAAF lies in its establishment of a dense air defence network.[19] Defending Indian airspace from any future PLAAF challenge with the proliferation of aircraft like the J-20A, presents a challenge the Indian Air Force (IAF) has few answers to numerically or in terms of capability. The PLAAF has the first mover advantage over the IAF, according to Arjun Subramaniam's chapter, with its superior space and information warfare assets coupled with its standoff weapons capability and superior multi-layered air defence systems.

Similarly, China's growing naval capability has resulted in an impression that Beijing not only seeks primacy in near seas but naval dominance in far flung areas. The naval expansion of the PLA continues apace through its Anti-access and Area Denial (AAAD) capabilities. The Chinese navy has made progress in both the surface and subsurface segment of its fleet. The People's Liberation Army Navy (PLAN) has procured 12 Russian-made Kilo Class conventional submarines since the mid-1990s, and added four indigenously developed submarines. These include a Jin Class 'Type 094' nuclear-powered ballistic missile submarine (SSBN) and a new Shang Class 'Type 093/093' nuclear attack submarine (SSN). The latest addition to the PLAN is the SSN classified Song Class 'Type 039/039G'.[20] Each of the Jin Class submarines will be equipped with 7,400-kilometre range JL-2 nuclear-armed submarine launched ballistic missiles (SLBMs). Significantly, advances in the submarine arm of the Chinese are a by-product of Russian designs.[21] The Chinese navy's surface fleet has also witnessed improvements. The latest addition is the first Chinese aircraft carrier *Liaoning* 'Type 001' design vessel to the PLAN's surface fleet. It is a conventionally powered carrier with a displacement of approximately 60,000 tonnes. A second carrier, the *Shandong,* is under construction and a third carrier is planned.[22] The air wing of the *Liaoning* could potentially consist of a combination of 36 fixed and rotary wing aircraft, including 24 J-15 fighters, six anti-submarine warfare helicopters, four airborne early warning helicopters, and two rescue choppers.[23] China expects to induct four to six aircraft carriers. The current and follow-on *Shandong* carrier might be limited by operating range, though not so, if reports are to be believed. The PLAN's long-term ambitions include the acquisition of nuclear-powered carriers, resulting in two carrier strike groups operating in the Western Pacific and an additional two groups in the Indian Ocean.[24] The potential Chinese nuclear-powered carriers will inevitably use electromagnetic catapult systems for the launch of carrier-based fighter aircraft.[25] Notwithstanding an absence of experience in operating carriers, the PLAN's introduction of aircraft carriers provides additional weight to the Chinese navy's surface warfare and force projection capabilities. The

Indian Navy, on the other hand, is floundering according to RADM (Retd.) Sudarshan Shrikhande, with its limited resources being squandered on 'symbolic aircraft carriers' and placing ship building orders for specious reasons like keeping yards, which alone do not make a strong argument for poor platform choices or the lack of anti-submarine helicopters.

China's military modernisation has also resulted in the proliferation of military technology in the region, enhancing the military capabilities of a number of states, including Pakistan. Pakistan's indigenous Unmanned Aerial Vehicle, the 'Shahpar', bears a striking resemblance to the Chinese CASC CH-3. The co-development and production of the JF-17 in significant numbers for the Pakistani Airforce has a cascading effect on India's conventional deterrence.

Implications for India

India's loss in the 1962 war against China had for the first time exposed serious deficiencies in post-independent India's defence posture and capabilities. As a result, New Delhi made a sustained effort to build its defence forces. Much of the focus went to the Army and the Air Force, as New Delhi realised the "reality of having to make defensive arrangements along a vast frontier".[26] By late 1963, a new defence plan was formulated and India decided to increase its defence expenditures from 2 percent of GDP to about 5 percent.[27] Under this defence plan, 10 mountain divisions were raised along the Himalayan frontier. India also upgraded its Air Force by procuring MIG fighters from the Soviet Union and advanced radar systems from the US. Long neglected, the Indian Navy finally started receiving some attention but its role in any conflict with China was considered miniscule. For long afterwards, India's approach was to ensure that a repeat of 1962 could be avoided by putting up a resolute defence against any aggression from the Chinese forces. Defending the mountain passes in the border was the sole focus.[28]As an inadvertent result of India's wars with Pakistan in 1965 and 1971 and consequent military modernisation of its defence forces, India's deterrent capability vis-à-vis China automatically increased. By mid-1970's, India assessments of Chinese threat was reduced to Beijing's support for insurgencies in India's North East and military equipment to Pakistan.[29] If India's military modernisation had created a deterrent, infirmities in China's military capability became quite evident during its war with Vietnam in 1979.[30] By early 1980s, analysts predicted that the Indian Army was enjoying an "advantageous" position against China to the extent that it could make "incisive thrusts into Tibet across the Chinese borders in the North."[31] Chinese threat in the Indian Ocean was also miniscule. China's limited naval capability ruled out any sustained involvement in the Indian Ocean. India's naval attitude was also largely defensive. India's naval strategy towards the end of the Cold War was essentially one of creating a "*cordan sanitaire"* around India's waters.[32]

Such defensive strategy however is now under serious question, especially with the modernisation in Chinese military. In the last one decade, there has been a growing realisation in the Indian military establishment that on the face of growing Chinese military power, a defensive strategy will not survive. All the three

services therefore have adopted certain offensive components in their war-fighting strategies. The Indian Army, with the development of two mountain strike corps, now intends not only to withhold any Chinese conventional thrust but also to take the offensive into the Chinese territory.

Brig. Arun Sahgal's contribution in this primer however brings to fore the Chinese challenge in the Tibet Autonomous Region and limitations of the Indian Army offensive aspirations.

The Indian Air Force similarly has now placed its most advanced air assets along the Line of Actual Control (LAC). The Navy, on the other hand, has been arguing for economic strangulation of the Chinese economy by attacking China's sea lines of communication in the Indian Ocean, in case of hostilities along the land frontier.

Lt. Gen (Retd.) Narasihman argues that the three services operational and strategic deficiencies originate from an incoherent grand strategy and any offensive makeover remains uncoordinated at the highest levels. First, the lack of progress in adopting a capability-based approach versus the existing threat-based approach reflects the determination of bureaucratic interests in the individuals service branches to preserve their own interests, rather than maximise combat performance efficiency. Any integrated war fighting capability is dependent on individual services maintaining capabilities in their core competencies. All three services currently continue to operate in silos with number-based calculations versus capability-based approaches is a reflection of bureaucratic interests in the individuals service branches to preserve their own interests, rather than maximise combat performance efficiency. Given the constant referencing by the armed forces of the two-front war scenario against Pakistan and China, maximising the combat potential of limited assets available due to limited logistical availability or delays in modernisation will help services fill capability gaps. An ongoing research at the Observer Research Foundation based on quantitatively examined time-series data constructed from ten IISS Military Balance volumes from 2008-2017, depicts a depressing force ratios heavily in favour of the adversary, in this case China and of course Pakistan. Figures are reflective of China's spend of 3.2 times more than India on defence.

Even when the Indian defence establishment recognises the need to counter PLA modernisation and adopt the operational concepts of "informationised warfare", which has become the PLA's key operational concepts, there exists a broader ambivalence regarding force integration among the three Indian services. There is little evidence to suggest that any of the three services have adopted a capability-based approach versus the previous threat-based approach. The Indian Army is still in the process of raising the Mountain Strike Corps to further add manpower to its standing strength of 1.18 million men. The Indian Air Force continues to press for 42-45 fighter squadrons to deter a two-front war while the Indian Navy wants to eventually operate 200 ships, including three aircraft carrier groups. Although there are plausible reasons for each of

these demands individually, there is little to align these goals with a broader strategy shared among the three services. Arzan Tarapore's chapter covers the doctrinal concept known as Multi-Domain Battle (MDB) designed to evolve the concept of joint war fighting, by more deeply integrating operations in the three traditional domains of battle—land, sea, and air—alongside the two, and by analysing how the Indian armed forces are far away from adopting the concept of jointness and how other increasingly essential domains of cyber and space remain missing.

And finally, do nuclear weapons have a role in the Sino-Indian dyad? S. Paul Kapur and Diana Wueger argue that nuclear option provides India an import measure of insulation and protection against an increasingly coercive China.

The aim of this primer is to assess India's current military's effectiveness and combat potential vis-a-vis China. While there are no easy answers or simple formulas for the assessment of Indian military effectiveness, it is vital to understand how the changing capabilities, doctrines and tactics of the Chinese military impacts the effectiveness of India's conventional military deterrent. Given that China is unlikely to shift strategies away from relying on coercion and manipulating risk to achieve its territorial objectives, observing its military modernisation and development of power projection capabilities will influence the trajectory that characterises the Indian defence establishment's strategy to counter the kinetic and geographic components of China's growing capabilities. China's lack of any combat experience for more than 30 years and or experience in conducting joint operation in 'far seas' or on land will remain a short-term advantage Indian military develops effective counters against.

India's military effectiveness must be located at all the three levels of military activity: the strategic, the operational and the tactical. While overlapping, each is characterised by different actions, procedures and goals. This primer emphasises the operational approach, underlining the importance of doctrines, tactics, combined arms, inter-service systems and their proper utilisation on the battlefield, and makes a break from the narrative of observing capabilities centred on new military hardware as it is introduced in-service. If this primer succeeds in generating an honest debate on the military challenge China poses to India, it would have served its purpose.

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2 THE CHINESE PEOPLE'S LIBERATION ARMY IN TRANSITION: IMPLICATIONS FOR INDIAN DEFENCE

RICHARD A. BITZINGER

For the past 20 years or so, China has been engaged in an ambitious effort to modernise and upgrade its armed forces. These modernisation activities have several objectives. For one thing, as China strives to become a global power, it is increasingly seeking "hard" power, i.e., military strength, commensurate with its growing economic, diplomatic, and cultural "soft" power. Additionally, Beijing is more and more prone to use military force (or the threat of military force) to defend and promote its regional interests, such as its territorial claims in the South China Sea or protecting local sea lanes of communication (SLOCs) vital to its energy supplies and trade; consequently, building up that military wherewithal is instrumental to this strategy. Moreover, China's growing global footprint is, if anything, largely the result of its expanding international economic and commercial interests. This is evident in Beijing's push for such China-centric initiatives as the Asian Infrastructure Investment Bank (AIIB) and the One Belt One Road (OBOR) initiative, which depends heavily on a network of ports and other coastal infrastructure projects, and on Chinese access to the "strategic pathways of the Indian Ocean."[1] Finally, China overall seeks military power to mitigate the rising American military presence in the Indo-Pacific, and to establish itself as a credible rival to the US in this region.

For whatever reason, these modernisation efforts have paid remarkable dividends, and since the late 1990s, China's People's Liberation Army (PLA) has made amazing progress in transforming itself into a modern fighting force. In many instances, it is practically unrecognisable compared to the PLA that existed 20 years ago. The impact of this transformation has been particularly noticeable in the past few years in the form of a much more assertive—even aggressive—China, increasingly willing to use its military to protect and advance its national interests. What the end result of this military modernisation process will be, or how China may further use its growing military power, is still an open question.

At the same time, given China's emphasis not only on expanding international trade and commerce but on increasing its political clout globally, it is not surprising that Beijing is attempting to strengthen its ability to project sustainable power farther and farther beyond its territory. This is having a particular impact in the Indian Ocean Region (IOR). While China might not possess a coherent constellation of "bases and places" stretching across the IOR, it is increasing its global reach more than ever before. This is apparent in Beijing's recent establishment of its first overseas military base in Djibouti, a small country in the Horn of Africa. In conjunction with this event, an article in China Military, the official English-language news website for the PLA, explained, "The PLA's responsibilities today have gone beyond the scale of guarding the Chinese territories," requiring it to "protect China's interests anywhere in the world. Overseas military bases will provide cutting-edge support for China to guard its growing overseas interests."[2]

As China becomes economically and militarily more present in the IOR, this will inevitably disturb an already brittle regional security calculus. In particular, India will have to deal with another aspiring great power operating in its strategic backyard, one that increasingly seeks to displace—or at least rival—it as the leading regional player.

China's Emerging New Military Doctrine: "Informationised Warfare"

The most recent stage of Chinese war fighting doctrine is "informationised warfare." This comes out of the PLA's most recent defence white paper, published in May 2015. It lays out an even greater emphasis on "informatisation" and makes it central to operational concepts:

> *"To implement the military strategic guideline of active defense in the new situation, China's armed forces will innovate basic operational doctrines. In response to security threats from different directions and in line with their current capabilities, the armed forces will adhere to the principles of flexibility, mobility and self-dependence...Integrated combat forces will be employed to prevail in system-vs-system operations featuring information dominance, precision strikes and joint operations."*[3]

According to the 2015 white paper, the PLA will continue to de-emphasise land operations, all but abandoning People's War (except in name and in terms of political propaganda), particularly in favour of giving new stress and importance to seapower and force projection: "The traditional mentality that land outweighs sea must be abandoned, and great importance has to be attached to managing the seas and oceans and protecting maritime rights and interests."[4] As a result, the PLA Navy (PLAN) "will gradually shift its focus from 'offshore waters defence' to the combination of 'offshore waters defence' with 'open seas protection,'"[5] an evolutionary development from what was announced in the 2006 white paper, which proclaimed that the "Navy aims at gradual extension of the strategic depth for offshore defensive operations."[6] This will require a "combined, multi-functional

and efficient marine combat force structure. The PLAN will enhance its capabilities for strategic deterrence and counterattack, maritime manoeuvres, joint operations at sea, comprehensive defence and comprehensive support."[7]

As for airpower, the 2015 white paper stated that PLA Air Force (PLAAF) would "endeavour to shift its focus from territorial air defence to both defence and offence, and build an air-space defence force structure that can meet the requirements of informationised operations."[8] This included building up the PLAAF's capacities for strategic early warning, air-carried precision-strike, air and missile defence, "information countermeasures," and strategic force projection (i.e., airlift).

Further differentiating current "informationised warfare" from its earlier manifestations is the much greater emphasis placed on both cyber operations and space war. As the 2015 white paper put it, "Cyberspace has become…a new domain of national security.…As cyberspace weighs more in military security, China will expedite the development of a cyber force, and enhance its capabilities of cyberspace situation awareness [and] cyber defence."[9] In addition, outer space "has become a commanding height in international strategic competition," and China plans to "secure its space assets to serve its national economic and social development, and maintain outer space security."[10]

An Increasingly Blue-Water PLA Navy

Overall, China has been engaged in an ambitious, concerted, and methodical transformation of its armed forces since the late 1990s. China's recent military acquisitions, as well as its current R&D efforts, particularly its emphasis on "trump card" weapons for asymmetric warfare, have been critical developments in the upgrading of its war-fighting capabilities. At the same time, the PLA has made considerable progress over the last 15 years in enhancing the professionalism of its military personnel, and in expanding its training and making it both more realistic and more joint. Consequently, China has noticeably improved its military capabilities in several specific areas—particularly missile attack, precision-strike, power projection at sea and in the air, and joint operations. In particular, the Chinese have made significant advances in exploiting informatisation, in order to promote the development of advanced weaponry, accelerate the pace of military modernisation, and create new levers of military power for the PLA.

Ultimately, the PLA seeks to turn itself into a modern, network-enabled fighting force, capable of projecting sustained power far throughout the Indo-Pacific region. If successful, then the long-term trends in Chinese military modernisation have the potential, in the US Department of Defense's words, to "pose credible threats to modern militaries operating in the region."[11]

This global presence has, unsurprisingly, led to new responsibilities and new tasks for the PLA, and especially for the PLA Navy (PLAN). As

laid out in China's 2015 white paper on defence, these include safeguarding "the security of China's overseas interests," as well as promoting "China's security and interests in new domains."[12] The document characterises the maritime space as critical for "enduring peace, lasting stability and sustainable development of China," urging an end to "the traditional mentality that land outweighs sea" and stressing the need for China to modernise its maritime military force structure to meet pressing national security and development interests.[13] These objectives mean that growing importance will be placed on the PLAN and its ability to project power.

The PLAN is not yet a blue-water navy, but is certainly attempting to move in that direction. Fuelled by expanded defence spending, the PLAN has been engaged in a concerted effort to replace and upgrade its military hardware since at least the late 1990s. From that point and into the early 2000s, China was a major customer for Russian naval systems, for example, acquiring four *Sovremennyy*-class destroyers and 12 *Kilo*-class diesel-electric submarines.

Since the turn of the century, however, the PLAN has increasingly relied upon Chinese shipyards to supply it with modern weaponry. Since 2000, China has constructed as least 22 modern destroyers of the Type-051 and Type-052 class, bolstering its efforts to stand out as a world-class navy. The most important of these are the 7500-ton Type-052C and Type-052D, which are outfitted with Aegis-type air-defence radar and fire-control systems, as well as HHQ-9 surface-to-air missiles (SAMs), housed in vertical launch systems (VLS). These destroyers are also equipped with the indigenous YJ-83 or YJ-62 anti-ship cruise missile (ASCM) and the HQ-2 land-attack cruise missile, a variant of the Russian Kh-55 missile. The Type-052 class is in the process of being replaced by a new super-sized (13,000-ton) Type-055 destroyer, a multirole, stealthy warship capable of carrying twice the ordnance of its predecessor.

In addition, China has added more than two dozen new frigates to its forces—particularly the Type-054A *Jiangkai*-class, which features a stealthy design and is armed with ASCMs and VLS-deployed SAMs—as well as the new-generation Type-022 *Houbei*-class catamaran-hulled missile fast attack craft, outfitted with YJ-83 ASCMs, of which at least 60 have been built.

China has also greatly expanded its submarine fleet over the past 15 years. Since the late 1990s, the PLAN has acquired at least 26 Type-039 *Song*-class and Type-41 *Yuan*-class diesel-electric submarines. These classes are the first Chinese-built submarines to feature a modern "Albacore" (teardrop) hull and a skewed propeller for improved quieting, and to carry an encapsulated ASCM capable of being fired while submerged through a regular torpedo tube, as well as an antisubmarine rocket. These submarines, along with the *Kilos*, can serve many functions—anti-surface, anti-submarine, mine-laying, special operations, etc.—providing the PLAN with a versatile (and stealthy) capability for long-range power projection. Finally, the PLAN has begun deploying a new type of nuclear-powered attack submarines, the Type-093 *Shang*-class; at least five *Shang*-class submarines are believed to be in service.

Particularly apropos to long-range force projection is the PLAN's recent acquisition of large expeditionary warfare ships. In recent years, China has launched four Type-071 *Yuzhao*-class 17,000-ton to 20,000-ton LPD (landing platform dock) amphibious warfare ships, equipped with two helicopters and two air-cushioned landing craft (LCAC), and capable of carrying up to 800 troops. Additional Type-071s are likely to be built, or else superseded by a larger LHD-type (landing helicopter dock) amphibious assault ship (reportedly under construction).

In perhaps its most dramatic development, the PLAN has recently begun to acquire aircraft carriers. Its first such acquisition was the former Soviet carrier *Varyag*. A casualty of the post-Cold War era, the *Varyag* was laid down in the early 1980s, but construction was halted in 1992 when the vessel was only 70 percent complete. Ukraine inherited it after the breakup of the Soviet Union and eventually sold it—a rusted shell, without engines, rudder, weapons systems or electronics—to China in 2001, ostensibly to be turned into a Macau casino. In mid-2005, however, the Chinese moved the *Varyag* to a dry dock at the Dalian shipyards in northeast China, where it underwent substantial repairs and reconstruction, along with the installation of new engines, radars and electrical systems. The rebuilt carrier underwent its first sea trials under PLAN colours in August 2011, and was subsequently commissioned the *Liaoning* and accepted into service with the PLAN in 2012. The *Liaoning* is equipped with the J-15 fixed-wing fighter jet—reportedly reverse-engineered from a Su-33 acquired surreptitiously from Ukraine—along with anti-submarine warfare and airborne early-warning helicopters.

More importantly, China has begun to construct its own indigenous carriers. In 2017, the PLAN launched the Type-001A, built at the Dalian shipyards. Rumours are that the PLAN could eventually acquire four to six aircraft carriers. If and when that happens, it would likely mean the reorientation of the PLAN around Carrier Battle Groups (CVBGs), with the carrier at the heart of a constellation of supporting submarines, destroyers, and frigates—an amalgamation of power projection at its foremost. Such CVBGs are among the most impressive instruments of military power, in terms of sustained, far-reaching and expeditionary offensive force; and such a development would constitute a major shift in PLAN strategic direction.

Chinese Airpower: Keeping Up with Naval Expansion

Modernisation efforts for the PLAAF and PLAN Air Force (PLANAF – the naval aviation branch of the PLA Navy) have focused on the acquisition of modern fighter aircraft with advanced air-to-air missiles (AAMs) and air-to-ground weapons, as well as long-range surface-to-air missile systems (which the PLAAF manages as a part of its overall responsibilities for China's air defences). The PLAAF and PLANAF have, over the past 15-20 years, acquired a large number of so-called "fourth-generation" or "fourth-generation-plus" fighter aircraft, capable of firing standoff active radar-guided medium-range air-to-air missiles or delivering precision-guided air-to-surface munitions. Beginning in the early 1990s, China

began to import the Russian-built Su-27 *Flanker* fighter jet; this was subsequently complemented by the purchase of the more advanced Su-30MKK version (first for the PLANAF and later for the PLAAF), and, eventually, Beijing and Moscow agreed to an arrangement to license-produce the Su-27 (designated the J-11A) at the Shenyang Aircraft Company. Altogether, the PLAAF and PLANAF have acquired approximately 300 Su-27s and Su-30MKKs, including at least 100 J-11As. Additionally, since the early 2000s, the Chinese have been manufacturing a reverse-engineered version of the Su-27 (designated the J-11B), albeit still relying on a Russian-supplied engine.

China is also manufacturing its first indigenous fourth-generation-plus combat aircraft, the J-10. The J-10 is an agile fighter jet in roughly the same class as the F-16C, and it features fly-by-wire flight controls and a glass cockpit (but nevertheless equipped with the Russian AL-31 engine, underscoring China's continuing difficulties with developing a usable jet engine). The J-10 first flew in the mid-1990s and production started around the turn of the century. Perhaps 300 J-10s have been delivered to the PLAAF since the early 2000s, with production continuing at a rate of about 30 aircraft a year. Altogether, by the end of this decade, the PLAAF and PLANAF will likely have at least 700 combat aircraft of the fourth-generation or later type.

All of these modern aircraft can fire advanced air-delivered weapons. The PLAAF has purchased the RE-77E (AA-12) active-radar guided air-to-air missile (AAM) for its Su-27s, while the Su-30s can be equipped with the Russian-made Kh-31P anti-radiation missile (for use against radars). The J-10 carries the Chinese-designed PL-12 active-radar AAM and the short-range PL-8, a licensed-produced version of the Israeli Python-3 infrared-guided AAM, as well as laser-guided and satellite-guided bombs, high-speed anti-radar missiles, and air-launched cruise missiles.

In a move comparable to the launching of the country's first aircraft carrier, China currently has two fifth-generation combat aircraft programmes—the J-20 and the J-31—in the works. The J-20 first flew in January 2011, and the J-31 followed suit in October 2012. Both planes nominally resemble currently flying fifth-generation combat aircraft (that is, the US F-22 and F-35 Joint Strike Fighter), and may have benefited from industrial espionage aimed at these two US fighter programmes.[14]While the actual details surrounding both aircraft—how stealthy they are, how advanced is their radar and other avionics, what kind of sophisticated weaponry do they carry, etc.—remains sketchy, the J-20 and J-31 programmes demonstrate China's ambitions—and the aggressive steps it is prepared to take—to claw its way up into the vanguard of advanced fighter-jet producers.

China's Expanding Footprint Across the Indian Ocean

In sum, it is readily apparent that China has made significant—perhaps even unexpected—progress in building up its military power over the past 15 years. And because China's rise is so recently tainted with a growing self-assertiveness (both, verbally and policy-wise) bordering on

belligerent, its growing military capabilities have injected new uncertainties into the regional security calculus.

For the past decade, China has been the most active in and around the South China Sea (SCS). The SCS is easily China's most militarised maritime area and, accordingly, the jumping-off point for its new globalised ambitions. PLAN and paramilitary Chinese forces have been increasingly active in the area, often behaving aggressively toward other nations' fleets, including the harassment of US naval ships. At the same time, China has expanded its military capacities in the South China Sea. Woody Island, one of China's largest possessions in the region, has undergone a dramatic military expansion in recent years, including the lengthening of its runway and improving its harbour. Additionally, China has been engaged in a massive effort over the past few years to assemble a constellation of artificial islands in the Spratlys, in the eastern part of the South China Sea. This building programme included the construction of runways on Fiery Cross, Subi and Mischief Reefs, as well as harbours and barracks, and is apparently entering a second phase: a full-scale militarisation push, including the emplacement of radar stations, artillery pieces and anti-aircraft guns on these islands.

For all its aggressive advances in the South China Sea, however, it is in the Indian Ocean Region that China's military footprint has been the most recent and far-reaching, and therefore the most disquieting. It is in the IOR, for example, where China has established its first overseas base, in Djibouti—strategically located near some of the world's busiest shipping lanes, controlling access to the Red Sea and the Indian Ocean. Djibouti serves as a key refuelling and transshipment centre, and it is the principal maritime port for imports from and exports to its neighbouring country Ethiopia.

This base, capable of accommodating up to 6,000 personnel, was opened in August 2017, for which Beijing will pay the government of Djibouti $20 million a year to keep it operational. Interestingly, China does not call its Djibouti establishment a "naval base". Rather, it is designated a "logistical support facility…not responsible for combat operations."[15] One of its declared functions, for example, is to service PLAN vessels conducting anti-piracy operations in and around the Horn of Africa. Nevertheless, the base is outfitted with armoured vehicles, and its troops recently conducted live-fire exercises.[16] Moreover, US intelligence sources have said that the Djibouti base is "probably the first of many" new Chinese overseas bases to come.[17]

Other elements in China's putative chain of "bases and places" in the Indian Ocean are less impressive but potentially equally crucial to Chinese power projection. There are several deep-water ports along the Asian and African coastlines where the PLAN could gain access and succour. More to the point, many of these ports and harbours were built, and often are operated, by Chinese companies, some of them state-owned. China has built deep-water ports in Sri Lanka, in Colombo and Hambantota; Pakistan, in Gwadar and Karachi; Myanmar, in Sittwe; and the Seychelles, in Port Victoria.

Further, there have already been cases where PLAN ships have used these commercial ports. Since 2014, a PLAN *Song*-class and a *Han*-class nuclear-powered submarine docked at the port of Colombo, which, incidentally, is constructed, run and controlled by China Merchants Holdings. Other PLAN warships have also used this port. In 2015, a *Yuan*-class sub was spotted at the port at Karachi, which is controlled by Chinese Overseas Port Holdings. Incidentally, Pakistan is currently buying eight *Yuan*-class subs from China. Moreover, the PLAN intends to use the port in the Seychelles as a refuelling point for anti-piracy operations. Other potential dual-use commercial ports include Moresby, Papua New Guinea; Sihanoukville, Cambodia; Koh Lanta, Thailand; Dhaka, Bangladesh; the Maldives; Lagos, Nigeria; Mombasa, Kenya; Dar-es-Salaam, Tanzania; Luanda, Angola; and Walvis Bay, Namibia. It is also worth noting that China controls one-fifth of the world's container fleet, and that its shipyards have built approximately 40 percent, measured by tonnage, of all commercial ships. In addition, the Chinese shipping giant Cosco has stakes in shipping terminals in Antwerp, Suez, Singapore and Piraeus, Greece.

Consequently, the long-speculated—and, by some, feared—"string of pearls" may someday become a reality. China is gaining the expeditionary military capability, bases and access to dual-use seaports and deep-water harbours to sustain naval operations stretching from the South China Sea to the Horn of Africa.

Implications for India

Despite dramatic progress in its military modernisation, it cannot be said that China currently possesses a global military presence like, for instance, the US Navy. The PLAN is most definitely not a blue-water navy in the strictest sense. It has a long way to go before it can create a sustainable open-ocean power-projection capability. And its footprint will likely remain confined to the Western Pacific and parts of the Indian Ocean region. That said, the combination of a more far-ranging Chinese navy, the PLA's new base in Djibouti, its ability to access a string of ports along the Asian coastline, and a growing Chinese shipping industry underscore not only Chinese ambitions to become global naval power, but also its determination to make it happen.

While China is gradually shifting its emphasis from land-based forces to naval and air power, this does not apparently affect the PLA's commitment to maintaining a strong ground army where it counts. For India, this is particularly critical, due to its 3000-km, oft-places disputed border with China. If anywhere, the PLA will continue to maintain a strong ground presence in this region.

Naturally, many of Beijing's neighbours have looked upon China's growing hard power and its "creeping assertiveness" in Indo-Pacific with a certain amount of trepidation. Some are attempting to hedge against a rising China by engaging in their own military build-ups. India, as well as some countries in Southeast Asia, have over the past decade or so been engaged in their

own, often intensive efforts to modernise their armed forces. As a result, these countries have added new or expanded military capabilities that can be directed against any potential "China threat". In particular, India is in the midst of upgrading its navy, acquiring several large surface combatants—including at least two and possibly three aircraft carriers—and over a dozen new submarines (both nuclear- and conventionally powered), as well as buying hundreds of new fighter jets. Singapore, Malaysia, Indonesia and Vietnam are all acquiring submarines and new warships, modern anti-ship cruise missiles, fourth-generation-plus fighter jets, and stand-off air-launched weapons.

The challenge to Beijing, of course, is that it may be instigating an arms race where it does not seek one, especially with regard to India, which increasingly sees itself in a rivalry with China for great-power status in the Indo-Pacific. At the same time, India faces the bigger challenge. If it seeks to compete with China for predominance in the IOR, it still requires much more potent political-military-economic sway. It must find a way to vie with Beijing's much deeper pockets when it comes to overseas investment and trade, such as the AIIB and OBOR. New Delhi might need to establish its own naval installations across the IOR, or at least negotiate military-use access to foreign bases. It should increasingly "take the fight" to the Chinese by expanding its own naval activities in places like the South China Sea, including joint exercises and freedom of navigation operations. These military-based actions, however, will demand a much more potent Indian armed forces, in particular, a military that is outfitted and trained for joint operations. Otherwise, India might find itself constantly running a distant second to China when it comes to regional clout.

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3 ACHIEVING INDIA'S MILITARY GOALS IN AN ERA OF TRANSITION

LT. GEN. S L NARASIMHAN (RETD.)

Ever since independence, India's armed forces have actively defended the territorial integrity of India. Between 1947-48,India and Pakistan fought the first Kashmir war; following which India fought a war with China in 1962 that was widely considered a defeat for its armed forces. This was closely trailed by the 1965 and 1971 wars fought with Pakistan, which resulted in victories. India significantly altered the world map by creating Bangladesh through the war of 1971. She also fought a limited war in Kargil in 1999 wherein she recovered all the territory occupied by Pakistan forces donning the garb of mujahedeen. Because of the number of wars that India has fought with Pakistan, along with its strategy of abetting terrorism in Kashmir as a part Operation TOPAC (Cheema, 2015),India's military focus was on Pakistan for almost half a century after independence. It was only towards the end of the 20th century that India's strategic concerns began shifting towards the military modernisation undertaken by the armed forces of her Northern neighbour--China. The realisation that her western front had been adequately catered to dawned on her and induced India to start keenly observing the northern front. At the same time, India's market reforms through the 1990's, coupled with its rising stature in international affairs gave it the confidence to play a greater role in regional and global security.

In the 21st century, India will have to develop a modern defence force not only to guarantee stability at home and in the neighbourhood but also to meet its global commitments. The Modi government has declared its ambition of making India a 'leading power' in the international system. To ensure that the Indian armed forces maintain their edge over Pakistan, attain parity with China and develop the ability to project force in Asia and beyond, the Indian government will have to address some key shortcomings. As things stand today, the Indian armed forces suffer somewhat from operational, financial and strategic deficits in the form of an incoherent grand strategy, lack of new technologies, inefficient budget allocations, limited civilian-military dialogue and a failure to invest adequately in research and development.

In order to achieve desired levels of force modernisation, the Indian government along with its armed forces will need to undertake a number of key reforms. This paper will first outline the operational milieu in which the armed forces are likely to operate in the coming years, following which it will offer recommendations for reforms in six specific areas; defining a national security strategy; structural reforms for defense procurement, integrating joint operations amongst the armed forces; strengthening India's asymmetric capabilities; synergizing military and civilian administrative structures; and finally, renewing the focus on research and development.

Operational Milieu

Before one analyses India's military goals and the means to achieve them, it is imperative to understand the operational milieu that her armed forces are operating in at present and will have to in future. Generally speaking, India's defence strategy and policies aim at providing a peaceful environment by addressing a wide spectrum of conventional and non-conventional security challenges faced by the country. However, a growing, confident and modern India faces multiple internal and external challenges which will manifest across several domains: land, sea, air, cyber and space.

One of the most active theatres is the Line of Control with Pakistan, and the Indian Army is perennially involved in facing and countering cease fire violations and action by terrorists aided and abetted by Pakistan. In 2017 alone, the Indian Army has neutralised more than 200 terrorists, losing about 60 officers and men in the bargain. The more geopolitically significant incident, however, took place over the Doklam Plateau, where Chinese and Indian troops were involved in a standoff for nearly 73 days before they disengaged on 28 August 2017. Even during this strained situation, not a single shot was fired. In fact, no firing has taken place on this border since 1967. Despite this silver lining, the Line of Actual Control (LAC) between India and China continues to remain tense. A number of such confrontations between the Indian Army and Chinese Army's patrols keep both the sides on their toes, and there remains a persistent risk that such stand offs may escalate. This is because both China and India are intent on shaping the future political, economic and security architecture in Asia. The differential in infrastructure between both sides of the LAC, however, places the Indian Army at a somewhat disadvantageous position. Therefore, it has to resort to some practical innovations to overcome the same.

Further, the Indian Navy is having to contend with increased forays of the PLA Navy in the Indian Ocean and in the extended neighbourhood. A series of strategic investments in naval bases and port infrastructure by China such as in Hambantota, Gwadar and Djibouti all indicate that the PLA Navy intends to bolster operational capabilities in India's neighbourhood. This only aggravates the challenges posed in other regions by the operations of the Pakistan navy and threat from piracy off the Gulf of Aden.

India will also have to prepare for new uncharted battlefield domains. Armed and unarmed

unmanned aerial vehicles (UAV) from the Northern and Western borders, for example, are likely to pose challenges to all the three services of the Indian armed forces. Such threats are exacerbated by a more permanent deployment of air assets by China in Gongga and Heping air fields. China is also likely to employ cyber weapons against India in the coming years, under the aegis of the Chinese Advanced Persistent Threat (APT) groups. Space is another domain that India will have to take note of. China's space programme, which was a part of the General Armament Department earlier, is now under the PLA Strategic Support Force.

Non-traditional security challenges for India include transnational crimes and terrorism. The use of Nepal's territory by insurgents, movement of fake Indian currency notes and an increase in external influences, for example, will pose significant challenges. Additionally, Naga and Manipuri insurgents operating from Myanmar territory into India pose a serious threat in India's sensitive North-East Region. To some extent, Indian policy has succeeded in blunting the adverse impact from such threats. The signing of a Framework Agreement between the Government of India and National Socialist Council of Nagaland (Isaac Muivah) group on 03 August 2015, for example, is a welcome development in this regard. Importantly, relations with Bangladesh have also been on the mend after the apprehension of several Indian insurgent leaders and the signing of the Border Management Agreement.

The operational milieu explained above dictates that the Indian armed forces should be prepared to operate both within and out of the country. Therefore, the strategy for the armed forces also should also focus on these areas. The following sections examine what India needs to do internally to strategise for her military goals to be achieved.

National Security Strategy and Doctrine

For New Delhi to develop an active response to the operational milieu outlined above, the Indian Government must be willing to publish a National Security Strategy and Doctrine. In China, for instance, the concept of war fighting has changed five times over a period of 54 years. Moreover, China began publishing Defence White Papers from 1998 which provided direction to her armed forces. The utility of these papers is only accentuated by the fact that the leadership in China gets two tenures of five years each, providing them with time to implement decisions that work to their advantage. In contrast, India's first Army Doctrine came out in 2004, followed by the second one in 2010.

Ideally, an effective military doctrine would cover the nature of wars to be fought, the missions of the armed forces, the types of campaigns and how various operations of war are to be conducted. The 2004 doctrine partially met this requirement, while the 2010 Indian Army Doctrine had a classified part which is not in the open domain. Similarly, a Joint Doctrine was published by the Integrated Defence Staff of India in 2010 and a Joint Training Doctrine was published in 2017, both of which aim to improve the joint operations capability of the

Indian armed forces. The Indian Navy and the Indian Air Force have also come out with a few iterations of their respective doctrines; but all this is happening in a disjointed manner in the absence of clear directives from the government.

Ultimately, the Indian armed forces should be prepared to operate in, and influence outcomes, in the Indian Ocean from the Cape of Good Hope to the Malacca straits in the near future. They will have to graduate to the role of Net Security Provider in this region. It is imperative that a National Security Strategy be published in a form and content that is deemed fit by the Indian Government. This will allow the armed forces to crystallise their operational role, and take on a path of modernisation based on the same.

Defence Procurements

While one realises that the modernisation of India's armed forces should be based on the operational role and the milieu in which they need to operate, procurement of weapons and equipment form an important part of that process. Therefore, achieving a modern and effective armed forces also requires rational and planned defence budgeting by the civilian administration. Today, a significant portion of India's budget is devoted towards revenue expenditure; which includes, salaries, pensions, stock maintenance and so on. As a result, the armed forces have been unable to devote greater resources towards capital procurement and research and development.

Outsourcing and private sector led services is a viable solution to this deficit. Today, the civilian sector is capable of handling many of the operations that they were not able to earlier. Additionally, the government must undertake a cost-benefit analysis on force strength, in order to trim down the armed forces in a rational manner. There is a precedence of reducing 50,000 personnel in the past (Katoch, 2016). The resources saved from reducing revenue expenditure will enable the armed forces to increase their spending on capital expenditure.

In the 2017-18 Budget, defence got $53.5 billion, a mere 1.56 percent of GDP. Unfortunately, even with this meagre amount, the Indian government has always fallen short of utilising the budget. For example, the defence ministry spent less by 13.5 percent (INR 11,595 crore) of its allocated budget in 2015-16, and in the previous year of 2014-15, it could only spend 85 percent of its allocation. To address this shortcoming, the Defence Procurement Procedure 2016 was published with the intention of, "institutionalising, streamlining and simplifying defence procurement procedure to give a boost to "Make in India" initiative of the Government of India, by promoting indigenous design, development and manufacturing of defence equipment, platforms, systems and sub-systems".

Again, however, the result has fallen short of expectations. It is imperative that the Indian government expedites defence procurement by simplifying procedures, training civilian and military personnel involved in procurement, delegating procurements to the service HQs and following the government to government procurement route. It can also

establish an integrated procurement team with representatives from Ministry of Defence, Integrated Financial Adviser (IFA) and the users. This team should be held accountable for time bound procurements. Further, the IFA's and Ministry of Defence representatives should have a stake and accountability towards procurement. Their performance needs to be analysed by the number of procurement projects they have been successfully able to help fructify. Procurement of weapons and equipment in predetermined quantities in a time bound manner will be an important goal for the Indian military.

Along with the procurement of equipment there is also a need to produce them indigenously. Public Sector Undertakings have been at the forefront of producing defence equipment. The goal of indigenisation was set at 70%. However, India has only been able to reach 30% presently. There is a desperate need to increase the indigenisation levels. 'Make in India' in the defence sector is meant to do that. However, due to certain impediments the expected progress is not being made. Accordingly, it is a necessity to iron out the obstructions to the 'Make in India' initiative in the defence sector.

Joint Operations

Today, most modern militaries have chosen to integrate operations between various wings of their armed services. This is because in multi-domain warfighting theatres, it is evident that no single service can win a war by itself. Instead, Joint operations are the way to go. In India, a joint operations doctrine was published in 2010 in two parts - conventional and low intensity conflict operations and psychological operations. Later in 2017, a Joint Training Doctrine was published. The publication of the Joint Training Doctrine is timely and a step in the right direction. Many of the concepts and procedures that have been introduced will complement India's stated ambition of becoming a "leading power". For instance, the training of personnel of friendly foreign countries in this doctrine indicates that India is a willing to take on greater security responsibilities in the region and emphasises the need for inter-operability between the armed forces of the countries in this region. Further, the 'Lead service' concept, which entrusts planning operations to a particular service based on its nature, is a good approach and it brings clarity in training for specialized military activities. Synergised approach to training in intelligence enunciated in the doctrine is the need of the hour to bolster such capabilities.

Additionally, the Joint Training Doctrine, as and when revised, should address the requirement of starting the joint training for officers of all three services from their early years in service. This will further to improve their joint operational capabilities. There is a need to train officers of all three services to think and act in a joint manner. Achieving a change in the mind set towards joint planning and execution of operations will be an important goal that the Indian armed forces have to work on. Some efforts like cross posting officers to each other's Headquarters (HQ) are already underway. This will facilitate them in understanding the functioning of each other's service and their requirements.

Again, China's experience with Joint operations can offer some insight for Indian military planners. In late 2015, China announced sweeping reforms in her defence forces. It is a bold step and is driven from the top. Theatre Commands have been created and this move is expected to improve the ability of the PLA to undertake joint operations.

In India, the experiment of jointness began with the raising of Andaman and Nicobar Command in October 2001. However, all the three services need to make an effort to make this experiment a scalable solution across multiple frontiers. At present India has have seven army commands, three naval commands, four air force commands and two tri service commands. To improve the jointness, there is a need to create theatre commands. Such commands will also have staff from all three services thereby increasing the joint operations capability.

The character of war is changing while the nature of war remains the same. Indian armed forces need to be more alive to the ever changing character of war and modify their exercises and wargames to meet the challenges posed by the same. Joint planning and execution needs to be emphasised in all the exercises and wargames.

Asymmetric Capabilities

Considering that the variety of threats that India is exposed to, both state and non-state, New Delhi will be hard pressed to develop a full arsenal of weapons systems to address these. Given some of India's financial, operational and strategic constraints, the Indian armed forces must be willing to invest in asymmetric warfare capabilities to meet continuously evolving threat scenarios.

For example, cyber capabilities that a number of organisations possess need to be synergised. A suggested model is to have a National Cyber Authority, which acts as an umbrella organisation for all organizations dealing with cyberspace. Similarly, in space operations, the armed forces must integrate its resources with other civilian agencies such as ISRO. The Integrated Guided Missile Development Programme that India is working on, is a step in the right direction in building asymmetric capabilities. Psychological Operations is another arena where a lot of work needs to be done. Contrary to the belief of some, Psychological Operations are not only needed during war but also during peace. Establishment of a Psychological Operations Agency at the government level and incorporating Integrated Defence Staff, Services and civilian agencies are just a few administrative steps that must be taken.. India should also concentrate on developing capabilities to operate globally in military operations other than war. This will ensure that she gains more prominence in the world and embraces her responsibilities as a rising power.

Integration of Armed Forces with the Ministry of Defence

Defining operational strategies and undertaking military modernization requires synergy between the administrative operations of the armed forces and the civilian defence establishment. In order to implement all that has been mentioned above, the need of the hour is to integrate the armed forces with the Ministry of Defence.

While there have been instances of military officers getting posted in temporary billets in some of the ministries, the vice versa has not been true. This has resulted in lack of understanding of each other's requirements. It will be prudent if all the bureaucrats to be posted to the Ministry of Defence have a relevant tenure in service headquarters so that they understand the requirements and ethos of the services. Similarly, there is a need to post military officers in some of the appointments in the Ministry of Defence. Closer integration of armed forces with the Ministry of Defence will be one of the goals that will bring synergy to the common effort of modernising the armed forces of India.

Research and Development

Lastly, any developing country will have to invest heavily on research and development. India's Defence Research and Development Organisation (DRDO) has been the sole agency dealing in research & development (R&D) for India's defence sector. Its budget has been hovering between INR 8,000 crore and INR 12,000 crore for the last five years, which roughly accounts for less than 6 percent of the defence budget. A comparative assessment of military R&D budgets of major countries suggest that while India spends around $2 billion, the USA's R&D budget is approximately $90 billion, whereas China's is $ 40 billion and Russia spends approximately $18 billion on its R&D. What India needs is an organization like the Defence Advanced Research Projects Agency (DARPA) of USA,to ensure that US military has technological edge over its rivals. It has just a few hundred employees, outsources requirements to a large extent and is agile. DRDO needs to adapt itself to such techniques to upgrade her R&D capabilities and make India's armed forces stronger.

Conclusion

In conclusion, there are a number of goals that the Indian armed forces would like to achieve in the 21st century. These goals are rapidly changing and increasing in scope as India begins to take on a greater role in international affairs. This discussion is by no means an exhaustive attempt, but it aims to at highlight some of the major reforms that the Indian government and armed forces may need to undertake if they are to realise these goals and make India a 'leading power'.

(The views expressed are personal)

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4 CLOSING THE GAP: A DOCTRINAL & CAPABILITY APPRAISAL OF THE IAF & THE PLAAF

AVM ARJUN SUBRAMANIAM (RETD.)

'The Air Force will extend its reach from the sky to the space from defense of Chinese territory to attack as well. We will improve the overall capability to strike a t long-distance targets with high precision, fight electronic or internet warfare with back-up from space.

-Xu Qiliang (Former PLAAF chief &Current Vice Chairman CMC)[1]

For some decades now there has been a quiet confidence within the Indian Air Force (IAF) that it would more than hold its own against the People's Liberation Army Air Force (PLAAF) in a short, localised and high intensity India-China conflict across the Line of Actual Control. The three main competencies around which this confidence evolved comprised doctrinal robustness, superior aerial platforms and perceptions of superior training and combat orientation.

Enhancing the confidence of the IAF's operational planners was the combat experience gained by the IAF during the Kargil conflict of 1999 and the prolonged operational hibernation of the PLAAF after the Korean War in the 1950s. The employment of offensive air power at altitudes ranging from 14-18000 feet during the Kargil conflict helped the IAF validate many tactics and procedures that no air force had attempted before, including the employment of helicopters.[2] However, the numerous shortfalls in joint war-fighting methodologies that were brought out by the Kargil Committee Report steered by Shri K Subrahmanyam served as a compass for the IAF and Indian Army to reflect upon. The extensive employment of medium and heavy-lift helicopters (Mi17s and Mi-26s) in operationally live areas of Siachen and Western Ladakh and the operationalisation of high-altitude airfields and Advance Landing Grounds (ALGs), close to the LAC, offered potential for speedy reinforcement of defensive positions and logistics replenishment. Building on their combat experience from the 1965, 1971 and 1999 wars with Pakistan, IAF fighter pilots

gained experience through regular exercises with western air forces like the US Air Force (USAF), the Royal Air Force (RAF), the French Air Force(FAF) and other regional air forces like the Singapore Air Force.

Through much of the 1970s and 1980s, the PLAAF was stagnant, following the unfortunate death of their chief Lin Bao who challenged Mao in a power struggle and then perished in an air crash while attempting to flee China.[3] Adding to the PLAAF's doctrinal isolation was an inventory of obsolete platforms and equipment of Soviet-origin crude reverse engineered systems that were poorly supported by a struggling domestic aviation industry. Though many strategic analysts attribute the rejuvenation of the PLAAF to Chinese politician Deng Xiaoping, there are many drivers that have contributed to the revival of the PLAAF as a potent fighting force and a key determinant of contemporary Chinese military strategy.

Despite many recent analyses in India that point to a rather optimistic and skewed capability assessment in favour of the IAF, this paper will argue that policy and security planners would do well to take note of remarkable progress in the PLAAF's doctrinal advancements, training philosophy and plugging capability gaps with a judicious mix of indigenous equipment and state-of-the-art Russian equipment. The paper will also argue that this transformation has very little to do with attempting to catch up with the IAF, but has much to do with how Chinese air power can contribute to the larger strategic missions of China emerging as a global power that has the muscle to match the United States on a turf that appeared unsurmountable a decade ago.[4]

Recent IAF Doctrinal Evolution

The Gulf War of 1991 is a suitable marker to track the IAF's recent doctrinal evolution. The IAF is the fourth largest air force in the world with approximately 150,000 personnel and some 1,500 aircraft, of which more than 500 are fourth-generation fighter and fighter-bomber aircraft (approximately 100-150 of these are third-generation converts through extensive modifications).[5] The release of an all-encompassing doctrine into the public domain by the IAF in 2012 accompanied by clear articulation of a work ethos in the form of the core values of mission, integrity and excellence, marked the metamorphosis of the IAF from a predominantly tactical air force into a semi-strategic force with adequate 'full spectrum capability'.[6]

Doctrinal evolution in the IAF has been a slow process, impeded as it has been by a continuous struggle for doctrinal space within a 'land-centric' military environment. Despite a rich operational legacy left behind by the British and the innovative employment of air power in independent India's first war with Pakistan over Jammu and Kashmir (J&K) in 1947-48, there was not much development on the doctrinal front for almost four decades given that the force structure and capabilities of the IAF did not go much beyond providing limited counter-air and interdiction, localised air defence and tactical air support to the Indian Army.

Air Chief Marshal Pratap Chandra Lal, the

IAF chief during the 1971 war with Pakistan, re-prioritised the roles and missions of the IAF to support the higher directions for war, which looked at deterrence and protection of sovereignty as key drivers. Air Defence, Close Air Support and Battle Field Air Interdiction emerged as Key Result Areas (KRAs). They took precedence over offensive action deep into enemy territory. Lal writes with great clarity on the issue in his book 'My Years with the IAF':

> *"After the 1965 operations, there was considerable heart searching in the Air Force. Early in 1969 at the Commanders' Conference, we decided that the priorities for air operations had to change. Air Defence of the homeland and our air bases remained priority one. The next most important job was support of the Army and Navy, the army taking precedence over the Navy. Bombing, especially as a weapon to counter or neutralise or counter the enemy air, came third on our list of priorities."*[7]

This was the most emphatic doctrinal statement to emerge from the IAF, and Lal ensured that the IAF followed this in both letter and spirit while planning and conducting air operations in the two-front 1971 war with Pakistan.

The decades of 1980s and 1990s saw the IAF attempt to create a doctrinal template that looked at prosecuting air operations in a sequential manner wherein winning the air battle first was a prerequisite before conducting a successful air-land campaign. Air Superiority and Air Dominance were considered achievable with the advent of air superiority and multi-role aircraft like the MiG-29, Mirage-2000 and Su-30 MKI. The success of Israeli and US air power in the 1982 Bekaa Valley campaign and in 1991 during the Desert Storm spurred the development of tactics within the IAF to achieve Air Superiority before prosecuting other missions with vigour.

The Kargil war with Pakistan forced the IAF to rethink aerial strategies as it attempted to orchestrate an aerial campaign at altitudes of 14,000-18,000 feet against well camouflaged targets. Combining effective reconnaissance with ingenious targeting with both precision and 'dumb' bombs, the IAF created a disproportionate strategic and psychological effect, and hastened the final eviction of the intruders from multiple heights by the Indian Army[8]. What really went unnoticed was that the 'ghosts of 1962' were addressed by the IAF in terms of complementing the Indian Army's efforts in a high altitude battle. Ben Lambeth, arguably the most distinguished air power analyst and historian of recent times, offers a most dispassionate critique of modern Indian air power and writes in a recent monograph:

"In the Kargil War, the IAF rapidly adapted to the air campaign's unique operational challenges, which included enemy positions at elevations of 14,000 to 18,000 feet, a stark backdrop of rocks and snow that made for uncommonly difficult visual target acquisition, and a restriction against crossing the Line of Control that borders with Pakistan. Without question, the effective asymmetric use of IAF airpower was pivotal in shaping the war's successful course and outcome for India".[9]

The first decade of the twenty-first century saw the IAF engaging with frontline western air forces like the RAF, FAF and the USAF in wide-ranging air combat exercises. The excellent performance of the IAF gave it further confidence to articulate itself cogently on the effective exploitation of air power.

Because of both the changing paradigms of global warfare and its own refined understanding of global air power, the IAF effected two changes in its doctrinal discourse too. The first one was to discard the existing principles of sequential warfare and adapt to what was increasingly called parallel warfare, or the simultaneous application of combat power from day one of a conflict; the aim being to force conflict termination at the earliest. The second doctrinal shift saw an increased focus on the employment of air power at the lower end of the spectrum of conflict and an increased emphasis on joint operations in varied terrain with missions like shaping the battlefield and interdiction of the enemy's combat potential before it entered a theatre or Tactical Battle Area (TBA).

Growth of PLAAF Doctrine

The most comprehensive initial explanation of tenets of modern Chinese air power can be found in a 2011 monograph put together by a group of Rand researchers titled 'Shaking the Heavens and Splitting the Earth'. The five basic concepts of executing strategic coercion, independent and concentrated use of air power, joint application with other services, strategic force delivery and seizing information and electromagnetic superiority reveals a new and aggressive intent. What it also indicates is that the Chinese were willing to project air power as a strategic tool only after spectacular advances in Chinese aviation and space technologies manifested into platforms and capabilities.[10]

A 2017 edited volume from the China-centric Jamestown Foundation in Washington DC titled 'China's Evolving Military Strategy' is an excellent primer to look at the current PLAAF doctrine and strategy based on multiple Chinese strategic prescriptions from the Academy of Military Sciences and the National Defence University. At the fundamental level, there is much that has been written in the 'Science of Military Strategy' (2013)that challenges many of the "sacred cows of the PLA, starting with the dominance of the ground forces and calling for a more equal focus on ground, sea, air, space and cyber domains".[11] The speed with which ideas about new domains have been incorporated in China's latest White Paper is reflected in howSpace has now emerged as a domain that falls under the new Strategic Support Force, albeit still under the knowledge-driven umbrella of the PLAAF. This doctrinal shift much resembles the IAF's dilemma when it comes to claiming ownership of Space, but having to share control with the other two services as much bandwidth is used by all the three services. Just as a tri-service Space Command is on the integration table in India, the new Strategic Support Force is almost ready to assume ownership of Space in China with an initial PLAAF-heavy structure, but with shared ownership.

The second and most striking development that ought to be taken seriously is the presence of

two high-ranking PLAAF officers on the Central Military Commission (CMC). While the PLAAF chief was granted a slot on the CMC along with the People's Liberation Army Navy (PLAN) and People's Liberation Army Rocket Force (PLARF) chiefs in 2004, it is the elevation of a former PLAAF commander Xu Qiliang in 2012 as a Vice Chairman of the CMC[12] that has indicated Chinese President and CMC Chairman Xi Jinping's resolve to develop air and space power capability at a rate that could take the world by surprise in a decade or so. It is also an indication of Jinping's willingness to look beyond the PLA for military guidance. Rand Corporation in an authoritative monograph 'Assessing the Training and Operational Proficiency of China's Aerospace Forces',has tracked the many 'firsts' in Xu Qiliang's career, including a stint as the Deputy Chief of the PLA General Staff Department preceding his appointment as PLAAF commander in 2004-2005, indicating a focus on joint operations. Following Xu's footsteps with similar assignment profiles is the current PLAAF chief, Ma Xiaotian. A Su-30 qualified pilot as early as 1998 and currently closing in on 70 years, indicating the value he offers the PLAAF, is said to have pushed for greater focus on aerospace power as the key to an exponential growth in China's military capability. He is reputed to offer hawkish views on regional security and almost never travels abroad.[13] These vignettes, more than anything else, should serve as a cautionary marker for the IAF not to take a few operational and tactical markers as reflectors of a capability gap, and look at the larger picture to assess comparative doctrinal and strategic shifts that are taking place within the PLAAF.

The fine print of emerging PLAAF capabilities reveals a striking similarity with most modern air forces. The emphasis on long-range offensive precision strikes in air and space with enablers like refuelers and AWACS seems to focus on countering any aggression from Japanese, Taiwanese and US maritime forces with a combination of air and surface launched weapons. This obviously calls for synergy between the PLAAF and the PLSRF (People's Liberation Strategic Support Force), earlier called the Second Artillery, but now renamed to indicate the reach of the force.

The next important doctrinal improvement that should alert the IAF is in the realm of multi-tiered air defence systems and the ability to promulgate and enforce Air Defence Identification Zones(ADIZs) and 'no fly zones'. Here again, the PLAAF's capability development has been triggered by the need to extend its eastern air defence coverage well beyond the first island chain in response to the US pivot to Asia and the emergence of the Indo-Pacific strategic maritime space. A spin-off from this capability will be the ability to cover vast airspace in TAR and look deep into Indian air space. China's extensive constellation of surveillance satellites with short revisit cycles adds significant punch to target locating and tracking capability. This is an area where China has a significant lead over India's indigenous military space-support programme that is only likely to increase over the years unless there is an urgent military focus to India's space programme that complements a successful civilian space programme.

The improvement in tactical and strategic airlift

capabilities within the PLAAF, though not as pronounced as in the IAF, has resulted in the former being able to project non-kinetic capabilities of air power like it did in response to the Nepal earthquake. Notwithstanding the excellent infrastructure in TAR,which supports surface movement of formations and logistics support, the PLAAF is cognisant of the IAF's increased responsiveness by way of its airlift capabilities and operationalisation of numerous Advance Landing Grounds (ALGs) and airstrips along the Line of Actual Control (LAC). Its current development and production of medium and heavy lift platforms in large numbers, like the Y-20, will only add to PLA's ability to induct and switch forces through multiple mediums. Finally, the PLAAF's increased focus on electronic warfare, cyber and other support forces like 'base protection forces' is testimony to a concerted drive to make the PLAAF a contemporary and modern force. The newly createdPLA Strategic Support Force (SSF) also offers significant force multipliersupport to the PLAAF and contrasts with the Indian armed forces' inability to optimally harness its space, cyber and information warfare resources.

Capability Match-Up

Having explored the doctrinal face-off, a review of existing and future capability is essential to offer a holistic appraisal of current and predicted trajectory of the IAF vs PLAAF discourse in the context of an aerial face-off in a limited but high-intensity and high-altitude conflict. In the realm of strategic space assets for surveillance, reconnaissance, communication, targeting, electronic warfare and navigation, China is way ahead of India with its large constellation of both the latest Yaogan-30 series of Low Earth Orbit satellites and the BeiDou family of navigation satellites.[14] As per conservative estimates, China had over 130 military satellites in 2015 and had doubled its launch rate during the period of 2009-2014 as compared to the period of 2003-2008. In comparison, India's Cartosat, RISAT, INSAT, GSAT and IRNSS family of satellites are woefully inadequate, both in terms of numbers and capability to offer India any kind of parity. However, if one looks at a limited conflict scenario that demands limited coverage, the asymmetry is less pronounced. Translating this into operational terms, what space-superiority and better targeting mosaics offers the PLAAF is a first-strike capability by the PLARF against static Indian combat capability. Short Range Conventionally armed SRBMs like the DF-11 and DF-15 fired from mobile launchers well inside Tibet would exploit their 350-800+ NM ranges to hit targets comprising of airfields, logistics nodes, ammunition dumps and the likes with a reported accuracy of upto 5 metres, though the more likely accuracy for a larger number of missiles is around 30 metres.[15]

What this can achieve is to blunt the IAF's ability to launch its potent Air Superiority Fighter, Multi-Role Combat Aircraft and Ground Attack fleets comprising the Su-30 MKI, Mirage-2000, MiG-29 and Jaguar aircraft with the primary aim to fight for some degree of dominance over the PLAAF over a limited theatre of operation.

The IAF's combat edge in the air has narrowed down significantly with one Rand report pegging

the number of fourth-generation aircraft with the PLAAF as close to 700, comprising a combination of JF-10s, JF-11s, SU-27s and the potent SU-30 MKK, which is said to be only a tad inferior to the IAF Su-30 MKI. Added to these will also be the availability of at least a squadron worth of the aircraft carrier-based JF-15 4.5 Generation fighter. Of immediate worry for the IAF is the ability of the latest variant of the H-6 bomber, the H-6K, to carry six DH-10 cruise missiles, which have a range of around 1,500 km. These bombers have a combat radius of 1,800 kms,[16] which means that they do not need to get airborne from airfields in Tibet and can launch their cruise missiles on critical Indian military targets from well outside any kind of air defence umbrella that the IAF can put in place over the next decade. Though the Chinese J-20 and JF-31 Stealth fighters are some time away from operationalisation, the IAF's acquisition of the Rafale and induction of the indigenously-built Tejas would take time to translate into operational capability.

Many analysts argue that the IAF's air combat and weapon delivery capability is superior because of better training and more flying that Indian aircrew manage monthly. The IAF's much wider exposure to western tactics and best practices that have accrued over the last two decades have been nullified in recent years by the increase in the frequency with which the PLAAF has been exercising with JF-17s and F-16s of the Pakistan Air Force. In terms of sortie generation rates and the ability to sustain 24x7 operations, there has been a surge in PLAAF's capability though it still may not match the IAF.

Coupled with the high probability of widespread and debilitating surface-to-surface missile strikes on IAF combat capability that could severely hamper sortie generation rates, the PLAAF's distinctly superior network paralysing capabilities could seriously impact the IAF's command and control systems. If one moves sequentially, the next comparison leads towards the PLAAF's significantly superior air defence capability led by a multi-layered and highly potent missile umbrella that is rated very highly even by US standards. Comprising the newly acquired S-400, the older S-300 and its improved and reverse engineered version named the HQ-9—that the IAF is particularly concerned about—and the shorter-range HQ-12, the IAF's offensive air operations over the Tibetan plateau would be hotly contested even over the Tactical Battle Area, which is envisaged to be closer to the LAC and hundreds of kms away from PLAAF missile locations. Finding and destroying some of those systems in a dense Electro-Magnetic environment would be among the toughest and yet most vital missions for the IAF. Though the IAF, too, is shortly inducting the S-400 long range air defence system and would integrate it with the Medium Range SAM and Akash systems, the PLAAF network looks vastly superior upfront. Justin Bronk, a researcher with RUSI in London worries about the survivability of IAF fighter aircraft over the Tactical Battles areas in the vicinity of the LAC should reports of the PLAAF integrating its latest mobile SAM systems with forward PLA infantry formations in TAR.17

If there is one area where the IAF would be more than a match for the PLAAF, it would be

in terms of exploiting its medium and heavy lift transport and helicopter platforms in support of army operations. In response to the availability and expansion of PLAAF airbases in TAR, the increased availability of Advanced Landing Grounds and airstrips in Ladakh and Arunachal would offset the absence of a road/railway network in sustaining short and medium term operations.[18] Much is talked about the potency of PLAAF's airborne divisions, however, the efficacy of large airborne forces in mountainous terrain is severely limited and there is no question of launching airborne forces without total air superiority, a condition that the PLAAF is highly unlikely to achieve even in the medium term (four to eight weeks). IAF airborne assets to support Special Forces' operations would be more than adequate with C-130s Mi-17 V5s and the soon-to-be inducted Chinooks. Though the induction of aircraft like the Y-20 (similar to the IAFs C-17 heavy-lift aircraft) is likely to address this imbalance, the continued difficulty that the Chinese have faced in producing high-quality aero-engines is likely to hamper the induction of this aircraft as the PLAAF hopes to induct hundreds of these platforms over the next decade.The induction of the Apache Attack Helicopters with its robust Self Protection suite is likely to add significant punch to the IAF's ability to support surface operations including the remote possibility of limited armour operations in the theatre.

Prognosis

With its superior space and information warfare assets, the PLAAF has the first-mover advantage over the IAF. When coupled with its stand-off attack capability and superior multi-layered air defence system, the initiative clearly lies to the north. With its track record of not being the aggressor in most of its conflicts with either China or Pakistan, the chances of the IAF being hit first along a wide front by the PLARF and then having to respond means that survivability of assets, spectrum and networks is non-negotiable. Only then will the IAF be able to suitably respond with what is still a marginally superior offensive fighter force and highly responsive transport and helicopter fleet. While the PLAAF's increased integration, particularly with the PLA, PLARF and SSF, and embedded participation in joint exercises in the recent past must be noted with concern, the IAF's recent emphasis on parallel operations and continuous integration with the Indian Army in high-altitude terrain will result in immediate impact in and around the TBA. The cat-and-mouse game along the LAC will continue in the skies with the PLAAF seeking to deny the IAF space and time to effectively interdict the PLA's combat capability by blinding it and keeping it grounded, while the IAF will seek to get airborne at the first opportunity, blunt some of the PLAAFs air defence capability and cause attrition to both PLAAF fighters and the PLA's numerically superior forces on the ground. The bottom-line in this equation is that as China closes the military gap with the US, particularly in the realm of space, air power, SRBM/MRBM and network-centric warfare capability, the IAF must not be complacent. Instead, it must be prepared for a non-linear widening of the capability gap that already exists.

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5 INDIAN VASUKI VS CHINESE DRAGON: TOWARDS A FUTURE-READY INDIAN SEAPOWER

RADM SUDARSHAN SHRIKHANDE (RETD.)

"To become a maritime power is not a sufficient condition for China to become a power in Asia or in the world, but it is a necessary condition."[1]

In a 1910 article titled '*Britain & The German Navy',* written four years before WWI, Alfred Thayer Mahan urged Britain to be "*unemotional, businesslike (in) recognition of facts, in their due proportions… neither over-confident, nor over-fearful… timeliness of precaution is an essential element. Postponement of precaution is the sure road to panic in emergency.*"[2] He ends this paragraph with a flourish by quoting an unnamed "*English naval worthy of two centuries ago (who) aptly said, 'It is better to be afraid now than next summer when the French fleet will be in the Channel.'"*[3]

What would Mahan have said about China's global imprint, Asia-Africa footprint and Indo-Pacific bow waves or about the Indian Navy's "timeliness of precaution" or its readiness for summers to come? While outlining the possible strategic setting and competing maritime strategies[4] of India and China along the Indo-Pacific expanse, the chapter examines aspects of their execution/prevention at the operational level in time of conflict. It seems quite obvious that China would leverage the years of investment in improving its maritime geography through places and bases. It would also leverage military reforms, military hardware, joint instruments and ongoing high technology research and development (R&D) for operational advantages. Finally, it would leverage the considerable and steadily growing geo-political influence and geo-economic investments in the Indian Ocean Region (IOR) to be part of its joint-maritime strategic and military-operational effectiveness.

Correspondingly, what should be the changes required for India's maritime strategies and likely extrapolation into the future on the joint as well as maritime operational level of warfare? How could the current and likely future framework of being a net security provider within some

areas of the IOR impact on operations, if at all? What shape and contours should the Indian Navy's force structuring take to be future-ready and not merely "past-perfect" (the author's term loosely meaning "more of the same, but slightly better")? Would India be able to similarly bend economic heft and geo-political influence for maritime operational advantages?

The Strategic Framework of China's Power and Presence in the IOR

China is certain to be even more deeply involved as a geo-political and geo-economic player in the entire IOR as well as beyond the littoral into the African continent and deeper into West Asia and thence around the Mediterranean. The Belt and Road Initiative (BRI) and its "flagship", the China Pakistan Economic Corridor (CPEC), would be the major conduits for commerce, power and influence. Never before has a synthesis of Mackinder, Spykman and Mahan enabled any nation or empire to potentially straddle such a vast multi-continental expanse. However, China's ambitious grand strategy will inevitably have to be underwritten by military power. For India and other democracies—or indeed for any nation—to simply hope that it would not be so, could be an egregious "*postponement of precaution*." To attain and safeguard the objectives of their grand strategy, China would perhaps strive for:

- A greater network of places and bases not only throughout IOR but along the South Atlantic coast of Africa and into the Mediterranean itself. It would seek allies based on its own strengths or their weakness.
- Its investments as well as expectations of returns would require sustained protective presence. Since a fair proportion of this would be in less stable countries, future points of friction and cause for ever-increasing presence should be expected.
- In time, there would be greater likelihood of China challenging India in the IOR. Its global influence, increasing interests, competing economic power, occupation of Indian territory while coveting even more, as well as overall adversarial attitude, cannot simply be explained by paeans to "peaceful rise".
- The ever increasing robustness of the Sino-Pak axis would have serious strategic and, consequently, operational implications for India. In conflict, a really serious possibility is of a nexus so deep that India may need to fight a pre-meditated, coordinated and combined conflict against these allies. In any case, good strategic planning by India ought to take into account this possibility. The Sino-Pak relationship is verily a closer one than the trans-Atlantic partnership between the US and the UK.
- The web of friends, allies, subjugated and indebted regimes that Chinese statecraft spins quite successfully is likely to better serve Chinese hard-power than any comparable influence that a more benign, cooperative and values-driven India can leverage when and where it would be militarily most needed.

Presence has its Limitations

With this larger picture in view, it is possible to focus more closely on the maritime domain. However, some incongruities in terminology that are increasingly encountered need pointing out:

- The importance of "presence" should be understood but its leverage not exaggerated. Analysts and even naval officers often over-read the value that a group of ships, even a carrier battle group (CBG) actually provides, especially off the coast of a near-peer or peer or peer-plus nation/alliance.[5] Presence in peace may often need to transit into combat missions of sea control/sea denial and power projection. Unlike presence, these are missions in conditions of conflict. There is a by no means unique example of the limitations of presence or gunboat diplomacy. This happened in December 1971 with the USS *Enterprise* CBG. It was diverted from a combat zone in South East Asia to another combat zone in the Bay of Bengal with hardly any outcome in favour of the US.[6] Presence through deployments is important, often necessary and sometimes quite effective. However, limitations, too, need to be kept in mind. Like deterrence, presence, too, has to work on the mind of who we may try to coerce or dissuade.
- Power projection is another loosely used term.[7] In specific naval contexts, *"Power projection focuses on the land. Its goal is projection of naval force from sea onto land. It is a wartime mission. Execution of the power projection mission rests in strike warfare, amphibious warfare and strategic nuclear strike."*[8] Power projection essentially is about delivering ordnance on and over land, including through soldiers landed or air-dropped ashore.
- Deployments, therefore, should not be conflated with sea control, power projection and, sometimes, with coercive presence itself. Naval presence is an old operational measure commonly seen in the age of sail and in circumstances when maritime domain awareness (MDA) was often limited to the horizon of a lookout atop a mast. Today, sustained presence does help in responding to sudden events, but these are mainly in the nature of search and rescue, disaster relief, constabulary and anti-piracy roles. While presence can keep tabs on other navies and forces, it cannot as such prevent or reduce some other navy's deployments. Sustained presence in several locations comes with unintended costs of reduced combat training and worn out hardware (and sometimes people) often for questionable benefits. The Chinese are aware of this and hence their endeavour for acquiring places and bases. Consequently, their transition from presence to conflict in the IOR could be easier than for the Indian Navy even in the choke points that it would like to focus upon. [9]
- There has been no serious naval conflict between matched countries or even near peer armed forces for several decades. The 1982 Falklands War, and in some ways a few periods of the "Tanker War" during the Iraq-Iran conflict of the 1980s are perhaps the last occasions. Yet, if conflict between major armed forces takes place, the war at sea and from the sea could still be deadly in its effects. Navies have to keep in mind the severely different conditions of conflict and of peace time deployments.

Operational Considerations of Maritime Geography

The drivers for and the possible military-strategic and operational benefits of Chinese initiatives

towards altering maritime geography in their favour within the first and second island chains are well known. Likewise, much has been written over the past decade about the Chinese "string of pearls". It does not matter that this phrase is of western coinage. What should matter is that China could, and would, leverage the spread of "places and bases" for operational advantages.[10] The overlapping benefits of its economic, political-diplomatic, military sales, military training influence along the Asia-Africa-Pacific expanse are going to be substantial.[11] More specifically, we should consider these:

In years to come, the maritime geographic advantages of India's peninsular orientation are likely to erode further. Within the framework of operational art, tenets like interior lines of operations, central positions are generally advantageous but this is neither etched in stone nor inviolable. On a national scale, the Indian central position and interior lines do not automatically yield advantages in a conflict against two fairly powerful neighbours, separately/allied/fully combined against us. China and Pakistan operating from two coordinated central positions with their own interior lines and exterior lines and positions do not make a pretty picture. It would be quite right to say that China, especially in league with Pakistan, will become as much maritime neighbour as a continental one. It is also likely that China may someday have more close partners in the Bay of Bengal Rim.

China will seek returns on its investments in the form of certain rights and facilities in some ports, airfields and bases. There certainly are issues of neutral and belligerent rights and obligations in conflict. History shows that nations have overcome such constraints. So far, their statecraft has worked to the benefit of their policy goals. After all, so far, China has been a better practitioner of the Mandala theory than India. There is little reason as yet to believe they might falter strategically even if tactically there may be the occasional setback.

Thus, these bases and places, coupled with their growing space-based surveillance and overall cyber-warfare capabilities, in tandem with the joint forces and ordnance can deploy an impact on the edge that the Indian Navy has. In case we have to contend with a combination of China and Pakistan, the maritime challenge would be considerable.

Despite the maritime geographic advantages and general goodwill that India enjoys with IOR countries, we are as yet less likely than China to have any helpful leverages in times of conflict. In contrast, a totalitarian China, with few values-based drivers, and surplus hard power as well as political will, is likely to have more leverage. Its "unfriendliness of purpose" to use George Kennan's evocative line about Soviet Russia as seen by the West, does seem applicable in China's case: *"… from it flow many of the phenomena which we find disturbing in the Kremlin's conduct of foreign policy: the secretiveness, the lack of frankness, the duplicity, the wary suspiciousness, and the basic unfriendliness of purpose."*[12]

The current government has, of course, initiated steps to bolster composite infrastructure and development plans for the Andaman and

Nicobar Islands. While clichés exist about these "unsinkable aircraft carriers," the armed forces have been conservative, even half-hearted militarily. Foremost among these is the resistance to meaningful and substantive jointness that leverages peninsular and island geography for military effectiveness.

In the geo-strategic continuum of the Indo-Pacific, the Indian Navy and other joint instruments cannot long avoid the solutions required to operate in the South China Sea (SCS) and even in the East China Sea (ECS) in future. Abhijit Singh is right in arguing that SCS matters for India's overall interests.[13] Recent statistics show that over 30 percent ($189 billion worth) of India's trade uses the SCS for transit.[14] Will China choose not to molest Indian trade in conflict in the SCS/ECS? Can India and the Indian Navy simply let it go under the current reality that we may not be able to do much about it?[15] What future steps could yield us reliable friends and allies so that Indian military can also have places, if not bases, to meaningfully exert pressure from? What type of platforms could exert counter-pressure in the enemy's littoral?

In a departure from much of the commentary, this writer would like to say that the Chinese do have a 'Malacca Vulnerability' but it is not the same as a "Malacca Dilemma." This is to say that China does not have a choice but to try hard and keep its imports, especially petroleum and commerce, flowing both ways through the Malacca Strait and through the gaps in the Indonesian archipelago. If it had a dilemma, it would imply that "do nothing" was also a choice. This is not to say that it won't make alternate provisions, use strategic reserves, rely more on Pacific routes, etc. But, these gateways into the IOR would need to be available for use. This vulnerability poses challenges as well as opportunities not only for China but also for India. It is quite likely that China may have more than a few options for places, if not bases in South East Asia and along the Bay of Bengal rim. Therefore, at this point, it would be more accurate to say that the Indian Navy has a SCS "dilemma." It needs to protect its interests there, but may not be able to currently.

The Dynamics of Vasuki and the Dragon[16]

In case Sino-Indian conventional deterrence is likely to collapse, what might be the contours of maritime conflict? Among many factors, this depends on whether it is a war of choice for China or for India; were the triggers sudden or contrived; time for preparation for one side and ability to cope with surprise for the other; utilisation of the strategic and operational factor of time towards leveraging factors of space and force. Other aspects to be kept in mind could be:

- A trigger for conflict from some friction/ incident at sea is less likely unless it is to be contrived.[17] The primary objectives of policy would be focused on land. It is also likely that a limited conflict, with relatively limited territorial objectives, could result in primary engagements between armies and air forces.
- The maritime theatres (to imply the IOR, SCS and perhaps some areas of the South Atlantic along the West African coast) could be used for either escalatory or de-escalatory pressures.

- China's SSBN fleet would have little reason to deploy in the IOR from SCS because the main focus of their deterrent targeting would be on US territories. (Rather, their other vectors, bolstered perhaps by Pakistan nuclear vectors, would play more into deterrence architectures.) A future Indian SSN and SSK force, suitably supported by Indian Intelligence Surveillance Reconnaissance (ISR) and hopefully by some politically friendly nations in the far East, could be used for deterrence pressure on their SSBNs in addition for our own sea lines of communication (SLOC) protection and Chinese SLOC interdiction. For major surface combatants, the vulnerabilities to attack in SCS without commensurate opportunity for offensive strikes, makes combat deployments questionable. An SCS vulnerability for India would always exist, but it needn't be a "dilemma".
- In actualising its counter strategies, the PLA continues to develop a quiver-full of land-based ordnance and long-range aircraft that would be increasingly effective even in the IOR. Of this, the combination of targeting sensors (OTH radars, space-based sensors) and anti-ship ballistic missiles (ASBM) as well as long-range cruise missiles and hyper-sonic weapons could pose the biggest problem for the Indian Navy to consider and solve in the IOR. There seems to be no particular reason why the PLA cannot do this in the IOR and there seems little rationale for them not to. Not only would such a sensor-weapon grid aid Pakistan, it would someday make even US CBG operations in the North Arabian Sea and the Mediterranean almost as problematic as they seem to be closer to China's shores.[18] It may be tempting— but unwise—to be dismissive of such possibilities.
- Another concern would be the likelihood of a PLA expeditionary group threatening or actually landing in strength somewhere in our island territories. It already has a robust capability, and with a combination of shore-based and CBG-centred air power as well as places and bases, they could attempt to create a diversion. This is very likely in case China carefully plans a conflict of choice.

Examining Indian Maritime-Military Tasking

Given the above framework, the broad maritime tasking might need to be along these lines:

- **Strategic Offensive ASW (SOASW).** In almost any scenario, it would be advantageous and necessary to keep track of the Pakistan Navy's SSKs, many of which would be capable of nuclear cruise missile launch. Since some of them would be similar to PLAN conventional SSKs operating in the IOR, Underwater Domain Awareness (UDA) would be both, complex and critical. Moreover, SOASW for Chinese SSBNs in the SCS should be on the drawing board. Among other things, this could be a contributor to deterrence stability, especially necessary during a conventional conflict.

- **Strategic Defensive ASW (SDASW).** As the maritime leg of India's nuclear triad begins to gather strength and we transition to Continuous at Sea Deterrence (CASD), providing SDASW to "boomers" on transit and patrol will be a resource-heavy, silent and unseen task.[19]

- SOASW and SDASW would require resources in terms of SSNs and SSKs, maritime patrol aircraft, future space-based sensors, quantum technologies and not the least, unmanned aerial and submersible vehicles. As these go about their tasks, UDA in peace would yield benefits in war.

- **ASW in Conflict**. The Indian Navy would need much more ASW capacities and capabilities. Submarines and submersible vessels, manned and unmanned, are bound to gain ascendancy due to virtues of stealth. If the currently predominant thinking that submarines are merely for sea denial and CBGs for sea control changes are stuck too, a navy could realise that this underwater force—when combined with greater networking, autonomy and ordnance carrying capacity for multiple types of targets—could well span naval missions encompassing sea-control, power projection, and better sea denial. Far greater numbers of submarines are required than the "*six of this and six of that*" approach that the Indian Navy has preferred thus far.[20] Could this change to a "dirty dozens" approach? This requires dispassionate analysis of the opportunity costs of disproportionate investments in surface forces of declining future-survivability in symmetric threat environments.

- **Counter Force and Counter Value Missions.** A navy's counter-value (CV) missions would be against another nation's economic and war-waging capacities. This would include SLOC interdiction, land attacks against requisite 'value' targets, etc. Counter-force (CF) missions are those designed to directly weaken the adversaries' war-making capacities. Benefits include impacting the enemies' ability to undertake further CV-CF operations. One could add to this:
  - At the tactical level, these missions essentially are about putting ordnance on target and avoiding becoming targets for the enemy's ordnance. Neither is easy.
  - CV and CF are usually simultaneous and complimentary, except under asymmetry wherein air power and sea power are largely unchallenged, CF could be a sequel to CV. In a Sino-Pak scenario, this would rarely obtain for India.
  - Just as the optimism in air power's speed of effects in CV targeting has almost always been higher '*a priori*' but more sobering '*ex-post facto*', maritime blockade, SLOC interdiction, and even economic sanctions envisaged by nations via their navies take longer to hurt the enemy than initial estimates.
  - The need to persist with CV missions from the start of a conflict exists, but "irrational exuberance" should be kept at bay. A peer-enemy would not only shore itself against effects but perhaps retaliate as well.
  - Depending on outcomes desired in the dynamic time-space-force conundrum, resource allocation and switching between CV-CF missions would be challenging but necessary. If a high tempo of action at the operational and tactical levels of warfare is required, then success in CF could eventually increase effectiveness of CV operations.

- This could mean that Indian interdiction of Chinese shipping (and, as pointed out by James Goldrick, you don't interdict SLOCs, you have to interdict ships by doing something to them or about them) will have slower effects than is widely believed.[21] Likewise, Chinese interdiction of ships of Indian interest in the SCS/ECS or even in the IOR for that matter, should be expected but would hurt us lesser than may initially be believed. There could be "loss of face" issues for both sides not just for the Chinese.
- CV-CF missions will require newer ways of qualitatively and quantitatively delivering ordnance on target. In this matter, we could dangerously lag behind China even in the IOR, especially with Pakistan on their side.
- Maritime CV-CF missions may be undertaken by ordnance and platforms that are fired/launched from land. Jointness is the key and not a buzzword. The Chinese have understood this and are doing a lot about it.

CBG and Surface Operations. By 2021, the Indian Navy will have one new aircraft carrier and another that is just seven to eight years old. Given some warning, both should be available for combat. Useful they would certainly be in asymmetric conditions, but challenges in near-peer environments cannot be dismissed. To project power, carriers have to necessarily operate in relatively smaller areas even if they might steam nearly 600 miles per day, vigorously generating combat sorties. An adversary should be expected to do his utmost to damage or sink a carrier and major escorts using various means. In debates these days, simplistic calculations of the PLAN's "x" number of carriers with the Indian Navy's mere "y" numbers overlook each country's resources and requirements, and that carriers can be countered by instruments other than carriers and their aircraft. China may use its carriers in more asymmetric circumstances as it becomes a global power just like the US does and just like the Indians could do until about 2045-2050 when it'll be time for Vikramaditya to retire. In symmetric cases, all carrier-operating navies are bound to be more circumspect as indeed are the Americans. Therefore, for ensuring overall effectiveness across the spectrum of conflict, the Indian Navy might need to think hard and spend its money looking at opportunity costs and alternate solutions.

Given the predominantly peer-conflict environment, the Indian Navy needs to de-emphasise the "symbolic" value of the carrier and look at its substance. Harsh Pant is right in stating that "The larger question the Indian Navy needs to ask is whether it should really prioritise aircraft carriers over its other requirements."[22] For future frigates and destroyers, the Indian Navy perhaps ought to be considering truly long range SAM (perhaps with some BMD) and land attack capability, besides a much larger ordnance capacity. However, considering the ineffectiveness of offensive ASW via surface ships, the IN's inclination for numerous corvettes and small ASW ships seems misplaced. Money saved could have been spent on ASW helicopters and medium range ASW aircraft. "The guiding principle ought to be to build what we need, not merely what we can."[23] Placing

orders for specious reasons like keeping yards alive is not a strong argument for poor platform choices. A final observation: Indian Armed Forces, especially the Indian Navy and the Indian Air Force should not go on believing that the "next" major acquisition is going to be "the game-changer." The phrase is used too generously. It was used just a few years ago for Vikramaditya.[24] Carriers can be important, but perhaps not game-changers. In many ways, it is the game that is changing for them as it did for battleships decades ago. [25]

Power Projection. The Indian Navy's power projection capabilities needs urgent upgradation in terms of quantum, range and lethality of ordnance it can deliver on land from multiple platforms. Against China in the SCS, submarines (SSNs and SSKs) via "covert presence" offer better options than any other platform. Joint strike capabilities with land-based long range cruise missiles and long-range manned and unmanned aircraft fielded jointly need creation and enforcement. This type of ordnance should have anti-ship versions as well. Third, the Indian Navy would need credible, permanent naval infantry/marines for expeditionary warfare. It is a pity if India continues to have rotational infantry battalions that are inevitably under-trained. The Navy need not "own" these marines, but they cannot really be "temporary" marines as has been in vogue for decades. The Indian Navy's keenness to acquire LPDs has meaning only if its teeth, the marines, become a reality.

Space and Cyber Offence and Defence. A Navy that will be increasingly networked and hopefully more joint and integrated should be able to leverage national cyber offence and defence capabilities as well as space-centred capabilities. China is bound to exert itself immensely in space and cyber warfare and its impact on maritime operations. In the absence of a functional, platform and ordnance-linked global positioning system that is wholly Indian, Indian vulnerabilities would need to be periodically identified and plugged.

Partnerships/Alliances/ Coalitions

Finally, nations would find it difficult to deter or engage in conflict with China without some form of partnerships. China has some credible partnerships, perhaps not as close and inter-twined as with Pakistan or North Korea (what a pleasant triangle) but close nonetheless. The trajectory of more places, bases and partners seems in China's favour. While India's usage of places and bases in conflict is an operational detail, ensuring it happens requires astute strategic statecraft. Exercises like Malabar or with the "quad" or mil-mil arrangements are unlikely to be of real effectiveness in the absence of clear political like-mindedness, policy match, or apex resolution of security and intelligence sharing issues. These exercises are merely the tail that cannot wag the dog of political partnerships. Misplaced hope that somehow the US will be a lead player in this matter must be avoided. Declarations of "100-year partnerships" or other pronouncements are not much beyond rhetoric and diplomatic niceties. True coalitions need substance far more than symbolism or even exercises of largish scope. There is little doubt that it would be a coalition that could best deter China and

perhaps modify its behaviour to some extent. Nonetheless, in the absence of a more formal partnership and mutual commitment, it is as unlikely, for instance, that India would jump to Japan's aid over an assault by China on Senkaku or Japan to India's if Tawang were to be attacked. Maritime and naval cooperation are useful, no doubt, but not sufficient to genuinely worry the other side unless an alliance by any other name exists. That is why a PLAN-Pakistan Navy relationship would be of greater concern to India than a Malabar exercise to China.

Conclusion

This essay links some of the problems that could face us at the maritime operational levels in case of a conflict with China, and perhaps with Pakistan as its close partner to possible solutions. The erstwhile leadership of the Indian Navy has done quite well to make it a fairly strong navy. The tasks ahead require some shifts in approach and execution to make the Navy more future-ready rather than more past-perfect. Moreover, all services and other agencies in India need to fully overcome narrow turf sensitivities, embrace true jointness, and put in place real civil-military reforms towards effective future war fighting. Above all, India needs to indigenise as fully, deeply and early as circumstances permit.

An increasingly economically, diplomatically and militarily powerful China is bound to break rules and make rules in decades to come. Power matters, after all. It is defined well by a naval axiom that if you rule the waves, you can waive the rules. Therefore, if the Vasuki is to deter the dragon or fight it to defeat it, then more could be done, but not less. To paraphrase Mahan's words, it is better to think all this through without waiting for the next monsoon.

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2: Mahan, Alfred Thayer. "Britain & the Germany Navy". *The Daily Mail*, 4 July, 1910

3: Mahan, ibid.

4: This writer prefers to use strategies in the plural because rarely would any major nation with complex maritime interests make do with only one strategy.

5: Author's use of this terminology is more related to the effective symmetry or asymmetry that obtains in the area and circumstances of a particular case. Secondly, should "presence" transition to conflict, vulnerabilities in doing "Sea Control" and in projecting power by even a powerful CBG cannot be ignored.

6: For a recounting of how a light carrier, *Vikrant* was used off the coast of East Pakistan in Dec 1971 after a Pakistan Navy submarine had been sunk and the Indian Air force had effectively established command of the air, see Sudarshan Shrikhande, Wings Over Water: The Rationale for Reinforcing Carrier Aviation for the Indian Navy, Naval Despatch, NHQ, Indian Navy, New Delhi, 1996. For a comprehensive analysis of USS *Enterprise's* deployment in the final days of the 1971 war, see Raghavendra Mishra, Revisiting the USS Enterprise Incident, Journal of Defence Studies Vol 9, No 2, April–June 2015, pp. 49–80 http://idsa.in/jds/9_2_2015_Revisitingthe1971USSEnterpriseIncident.html, downloaded on 23 June 2015.

7: Singh, Abhijit. "India needs a more robust presence in Asia", Lowy institute 1 Nov 2017, https://www.lowyinstitute.org/the-interpreter/india-s-mission-ready-naval-posture-must-extend-beyond-indian-ocean downloaded on 02 Nov 2017.

8: Byron, John. "It's War With Anastasia", *USNI Proceedings*, Annapolis, Feb 1992, p 55.

9: MOD/India Press Release, Naval Commanders' Conference in end- Oct 2017, "pib.nic.in/newsite/pmrelease.aspx?mincode33" downloaded 03Nov 2017.

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11: Shrikhande, Sudarshan, "Beati Sunt Possidentes: Blessed are Those in Possession; A Leitmotif for Chinese (and Pakistani Statecraft," http://www.vifindia.org/article/2017/april/10/beati-sunt-possidentes-blessed-are-those-in-possession .

12: Kennan, George. "The Sources of Soviet Conduct". Digital History ID 629. http://www.digitalhistory.uh.edu/disp_textbook.cfm?smtID=3&psid=3629

13: Singh, Abhijit. ibid.

14: China Power Report on SCS Trade

15: Singh, Zorawar Daulet. ibid, quoting Admiral Prakash, Arun.

16: *Vasuki* is a mythical Indian serpent employed by the gods to overcome enemies. First used by the author in an unpublished paper at the US Naval War College, Newport, R.I. in May 2003: Vasuki and the Dragon: Shaping India's Maritime Strategy as a Counterbalance to China.

17: Two cases that come to mind are the explosion on the USS Maine in Havana Harbour in 1898 and the Gulf of Tonkin incident which was used for escalating involvement in Vietnam in Aug 1964.

18: Tellis, Ashley. Address at the Goa Maritime Conclave 01 Nov 2017 conducted by the Naval War College.

19: Stefaniack, Tom. "Strategic Antisubmarine Warfare and Naval Strategy" (Lexington Books 1987).

20: Current plans seem to be for six boats of the Scorpene class and then by six of the 75 (I) type. Without AIP, towed arrays and with limited land-attack capability, the Scorpenes may not quite be the futuristic boats the IN requires.

21: Goldrick, James. "Mahan & Corbett: Concepts of Economic Warfare, Proceedings of the Chief of Army's History Conference". *Armies and Maritime Strategies*, Big Sky 2014, pp 17-28.

22: Pant, Harsh V. "The Dragon in the Indian Ocean is Shaping Local Geopolitics; does India have an Answer?" *Swarajya Magazine* June 05, 2017 https://swarajyamag.com/magazine/the-dragon-in-the-indian-ocean-is-shaping-local-geopolitics-does-india-have-a-counter, downloaded 08 June 2017.

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24: Pandit, Rajat. "INS Vikramaditya will be a game changer". *Times of India*, November 14, 2013. https://timesofindia.indiatimes.com/india/INS-Vikramaditya-will-be-a-game-changer/articleshow/25724093.cms

25: The First world War provided ample indications of how vulnerable battleships and battle cruisers had become to relatively asymmetric threats like mines, submarines and torpedoes from multiple platforms. Inter-war years showed that the aircraft would also be a threat especially with torpedoes and more accurate bombing.

6 INDIAN MILITARY IN TRANSFORMATION COMBAT POTENTIAL AND MILITARY CAPABILITIES VIS – A – VIS CHINA

BRIG. ARUN SAHGAL (RETD.)

A discernible bellicosity in the Chinese attitude towards India has resulted in increased tensions and aggravated boundary disputes. Since 2015, there have been three major Chinese intrusions, two in the Ladakh Sector (Depsang and Chumar) and the latest in the form of a 74-day standoff at Doklam on the India-Bhutan-China un-demarcated tri-junction. Muscle flexing, assertive border posture and, incursions across the Line of Actual Control (LAC)—including into settled or undisputed areas—have become standard coercive tactics by China to keep tensions alive and New Delhi on the defensive. Attempts at perpetuating border tensions is largely on accounts of perceived military asymmetry and an upgraded Chinese military posture in Tibet.

Apart from the military asymmetry, belligerence can also be attributed to India's steady economic rise, enhanced global standing following a major foreign policy push by the Narendra Modi government, and more importantly the India-US-Japan strategic convergence which China looks upon as a containment strategy to restrain her rise. Resultantly, China has hardened its stand against India on almost all bilateral and multilateral issues, severely constraining areas of convergence in bilateral relations. This was particularly visible in China vetoing India's membership of the Nuclear Supplier Group (NSG) and its inflexible stand on terrorism, notably in the declaration of Jaish-e-Mohammad Chief Masood Azhar as a United Nations sanctioned terrorist.

Another source of bilateral tensions is the increasing Sino-Pakistan collusion and the massive Chinese investments in Pakistan under the China-Pakistan Economic Corridor (CPEC), a major infrastructure boosting initiative involving approximately $64 billion. To appease China, Pakistan has ceded large tracts of land in the disputed Jammu & Kashmir territory for upgradation of Karakoram Highway connecting the disturbed Xinjiang-Uyghur Autonomous Region with the warm waters of the Indian Ocean at the newly developed port city of Gwadar. What is of concern is the bourgeoning

military relationship that transcends military sales and technologies, sharing of nuclear know how and even access to the restricted Chinese geo-navigation system BeiDou that has significantly enhanced the accuracy of Pakistan's nuclear delivery capability[1].

Although Beijing has traditionally underplayed threat from India, it has off late begun to look at India as a part of strategic collusion of forces arrayed against it, principally acting in concert with the US-led alliance system. Thus, it perceives India as a "near peer competitor", which if not contained could pose a challenge to China's regional and global aspirations in the long run.

Scope

Within the backdrop of a growing military challenge from China, the paper looks at the nature of threat posed by the People's Liberation Army (PLA) in terms of its force capabilities, doctrines and infrastructure in Tibet. It also tries to analyse India's doctrinal and capability enhancement required to meet the Chinese challenge in the medium-term perspective (2030).

PLA in Chinese Revitalisation Strategy

The 19th Party Congress has resulted in consolidation of power under President Xi Jinping, which has, apart from other things, put PLA at centre stage in the Chinese political hierarchy. The focus of President Xi's political report was to achieve "great rejuvenation of the Chinese nation" and restore China to its rightful great power status by 2049. What is of interest is that the time period of proposed national rejuvenation coincides with the PLA modernisation, and its evolution into "a world-class army by 2050". Even more importantly, the absolute leadership of the Party over the PLA further underscores the role of the military power in achieving Chinese revitalisation goals. There should be little doubt that China will not be shy to leverage military power both for dispute resolution or regional assertiveness to achieve its political goals.

PLA Military Reforms and their Relevance for India

The thrust of the PLA modernisation is to make the 2.25 million-strong force leaner and more efficient through doctrinal changes, structural reforms and manpower rationalisation. The overall approach of restructuring and modernisation is to achieve revolution in military affairs (RMA) with Chinese characteristics by 2020; and evolve as a fully informationised force, capable of winning information age warfare, by 2049. These twin aims are central to the realisation of the `Chinese dream' and its 'rejuvenation' as a great nation.

Objective of Reforms

The two basic objectives of reforms are to centralise the PLA's decision making in the hands of the Central Military Commission (CMC) and to transform the historically land-dominated military into an integrated force. The thrust of the reforms therefore revolves around:

- Revamping structures and systems at political, strategic and operational levels. A three-tier system has been established with

CMC at the apex, Functional Theater/Battle Zone Commands at the second, and the administrative system running from the CMC to the services at the third place

- Centralising all political-military decision making in the CMC that was hitherto enjoyed by the PLA (Army)[2]
- The erstwhile seven Military Area Commands (MACs)/Military Regions (MRs) have been reorganised into *five* `Theater Commands' (Northern, Central, Eastern, Southern and Western) to put in place joint structures to align China's strategic directions with command of troops [See maps]

Erstwhile and Restructured Military Regions

- A major troop rationalisation proposal is to reduce 300,000 troops, primarily from the Army, from other than the Western, Southern and Eastern Theater Commands, given the significance of borders with India, Vietnam and Taiwan. PLAN and PLAAF are being accorded priority for modernisation.
- A Ground Forces Command (Army Leading Organ - Army HQ equivalent) has been created to segregate PLA component from the General Staff Department, where it was traditionally embedded into the CMC and participated in policy formulation, even for the other services.
- The erstwhile Second Artillery Corps has been elevated to the level of an independent service (at par with the Army, the Navy and the Air Force) and designated as the PLA Rocket Force. It controls all intercontinental ballistic missiles, medium range and short-range ballistic missiles. This force will have separate wings for nuclear and conventional missiles. Its mission is to develop credible and reliable `nuclear deterrence and counter strike capabilities'.
- A significant development is the creation of a new Strategic Support Force (SSF). The service, when fully operationalised, would serve as the core of information warfare force and control all aspects of asymmetric warfare, including electronic warfare and

space & cyber capabilities, thus creating substantial force multiplier effect.

- Along India's borders, the erstwhile Chengdu Military Region and the Lanzhou Military Region have been amalgamated to form a Joint Services Western Theater Command, with its headquarters at Chengdu.
- Tibet Military Command (TMC), though located geographically within the Western Theater Command, has been placed directly under the PLA Ground Forces Commander (along with Xinjiang Military Command). This enhances the significance of the TMC, which is largely India centric.
- A Joint Logistic Support Force of the CMC, with five logistic support centres, has been created to cater for the common logistic requirements of all the services.
- After the Deng era curtailment of Chinese defence expenditure (1979-89), despite high economic growth, higher defence allocations (in real terms) have resumed post 1989, with double digit increase in defence expenditure.
- Regarding modernisation of PLAN, the Eastern and Southern fleets now form part of Eastern and Southern Theater Commands. The doctrinal shift is from `coastal defence & inshore defence' to `offshore defence and open sea defence'. The area of operations has expanded to the Western Pacific and, importantly. the Indian Ocean. By 2020, PLAN will have four aircraft carriers along with mix of nuclear submarines with JL-2 ICBMs with resultant implications of power projection, including in the Indian Ocean.
- The PLA Air Force (PLAAF) plans to technologically upgrade its current 2,000 combat aircraft fleet to have approximately 70 percent fourth-generation fighter aircraft. It also is developing its indigenous fifth-generation aircraft, J-20. Its frontline J-10 aircraft have been modified for operations in high-altitude areas. China has developed advanced three-tier air defence system based on ground-based sensors and airborne electronic warfare aircraft for early warning. It has also designed and deployed radar systems that are reportedly optimised to detect stealth aircraft, including passive surveillance systems. The radars are integrated in an '*air intelligence radar network',* covering the entire country.

PLA Ground Forces Reorganisation and Modernisation

PLA ground forces comprise Group Armies (GA) akin to the Indian Army Corps. These forces constitute the main offensive elements of the PLA and are employed for the strategic missions as dictated in the active defence doctrine that includes launching of pre-emptive operations.

Next are the 'Local Forces' or ground holding units akin to Indian defensive formations, employed for the territorial defence of the geographical area of their responsibility. In addition, there are Rapid Reaction Forces and Special Forces. People's Armed Police is militia responsible for maintaining law and order in border areas and equivalent to the Indian Para Military Forces.

There are a total of 18 Group Armies, located in the five Theater commands. An important

element of operational modernisation is the emphasis on developing "new type of combat forces" by laying more emphasis on army aviation, mechanised units, special operations and cyber/electronic warfare units.

Group Armies do not have any standardised organisational structure. They are mostly task oriented, which could include mechanised/ motorised, mountain or normal infantry divisions or brigades supported by task-based armoured brigades or divisions. As an example, the 13 Group Army that is part of the Western Theater Command (responsible for operations in the Ladakh sector of India) has two armoured brigades on its ORBAT, comprising nearly two dozen plus mechanised units, including armoured regiments and mechanised battalions.

Rapid Reaction Forces (RRF) have been created to cater for quick reaction to major operational contingencies (internal or external) anywhere in the country. There are a total of four Group Armies—13, 38, 39 and 54—designated as the RRF forces. The rapid reaction status essentially means that these formations together with their combat support elements can be deployed in any part of China within two weeks.

In addition, there is a major strategic intervention force, the 15 Airborne Corps, also designated as the RRF, though technically it is a PLAAF formation. It comprises three airborne divisions, each division with three regiments. The 14 Air Transport Division has IL-76, while Y-7 and Y-8 is the integral formation responsible for the air lift. As per available information, China has the potential to airlift one division ex 15 Airborne Corps in a period of 24 hours. Additional commercial airlift capability will be required to mobilise more forces for major strategic/operational contingencies[3].

In terms of equipment, PLA is being equipped with state-of-the-art indigenous weapons and technologies that enhance their combat capabilities, attuning them to function in net centric environment under the rubric of informationisation. Some of the specific aspects include lighter and more effective personal equipment, mortars and artillery with longer ranges, and laser-guided targeting.

Western Theater Command

The Western Theater Command (WTC) is the most significant development of the PLA reorganisation for India. It creates a single Battle Zone, headquartered in Chengdu, responsible for the land borders with India. Its responsibilities include the 4,057-km boundary-cum-Line of Actual Control (LAC) with India. This long stretch, due to terrain peculiarities and lines of communications, is fragmented. The same command is also responsible for the border with Afghanistan, Pakistan Occupied Kashmir (POK), Nepal, Myanmar, as well as well as the relatively quiet borders with the Central Asian Republics, Russia and Mongolia. The sensitive areas of Xinjiang and Tibet, with active terrorism and potential situations of unrest, are also its operational responsibilities. This vast expanse of territorial control, with peculiar terrain features, would pose a peculiar set of challenges for the smooth orchestrating of forces by a single commander during any conflict contingency.

Prior to the re-zoning, this responsibility was divided between the Xinjiang Military Region (headquartered in Lanzhou) and the Chengdu Military Region (headquartered in Chengdu). This command comprises three Group Armies—the 13th, 47th and 21st. Added to above are 10 divisions/brigades of the Tibet and Xinjiang Military Districts.

To enhance the force capability in the Tibet region, the troops from the erstwhile Jinan Military Region (now divided between the Northern and Central Theater Commands) and erstwhile Guangzhou Military Region (now Southern Theater Command) used to exercise in Tibet. Now, there is a possibility that other than the Southern Theater Command, formations from the strategic reserve and heaviest Central Theater Command (with five Group Armies) could be made available to the Western Theater Command for operations. These formations are better equipped and require minimum preparation for mobilisation and, thus, best suited for reinforcement tasks.

With the resources of the PLAA and PLAAF as well as the conventional missiles of the Rocket Force under command, the WTC will be to orchestrate joint and synergised operations against . The other impacts of the creation of the WTC in an operational scenario could be as follows:

- Qinghai region which was earlier part of the Lanzhou Military Region in the new West Zone will enable more flexibility in the induction of acclimatised and trained troops into Tibet
- Availability of reserve formations from other Theaters, which are better equipped and integrated, will enhance operational potential
- Strategic mobility thru mobilisation of civil aviation resources would put China in a position to mobilise 10 to 14 divisions in a period of two weeks, significantly enhancing the nature of threat
- With additional mechanised forces available and a terrain favouring the deployment, nature of mechanised threat has significantly increased. According to estimates by military sources, China has the potential of employing nearly three armoured brigades in Ladakh, comprising 12 to 16 armoured regiments supported by mechanised battalions
- With additional responsibility for the security and the success of $56 billion CPEC (China-Pakistan Economic Corridor), China will remain sensitive to infrastructural and force upgradation by India. Obverse, with high economic and strategic stakes being built into the project collusive threat from China, Pakistan should now be deemed to be a reality.

Infrastructure and other Developments in Tibet

In addition to both force build up and modernisation, China is also involved in a massive India-centric infrastructure buildup in the Tibet Autonomous Region (TAR) to include rail, road, airfield and telecommunication infrastructure. This includes capacity augmentation of the Golmud-Lhasa rail line with the capacity to mobilise upto 12 PLA divisions over a two to three week period in the sector of choice. Similarly, rail links from Lanzhou to Kashi and onto Lhasa facilitate easy switching

of reserves and logistics resources between the Chengdu and Lanzhou regions of the Western Theater bordering India. Additionally, China has developed a 58,000-km road network and constructed five operational airfields at Gongar, Pangta, Linchi, Hoping and Gar Gunsa[4]. China's massive programme to upgrade its airfields, including development of advance landing grounds, greatly enhances the Chinese Air Force's overall offensive potential in Tibet, including substantial strategic airlift capabilities, allowing rapid buildup of forces and shortening the warning period for India.

China is also preparing for asymmetric warfare by upgrading its net-centric warfare capability in the TAR. To support its command and control structures, China has installed very small aperture terminal satellite stations and has rapidly spread its fiber-optic communications network, covering all 55 counties of the TAR.[5] Secure communications and broadband connectivity allow fielding of battlefield command systems, which could tilt the cyber warfare balance in the favour of PLA.

Nonetheless, the vagaries of nature and the complexities of high-altitude terrain preclude the rapid and massed application of forces, calling into question PLA's ability to rapidly deploy regular and special forces for a preemptive offensive. To address this issue, the PLA is reportedly constructing hyperbaric chambers and oxygen-enriched troop barracks for speedy acclimatisation of troops.

Further to fine-tune its force application, the PLA has amplified both the level and the frequency of exercises in Tibet. The scope of these exercises is becoming increasingly sophisticated, and showcases Chinese capacities not only in net-centric warfare but in fielding integrated command platforms and providing real-time information and battlefield assessments. The PLA has reportedly been rehearsing capture of mountain passes in Tibet at heights over 5000m with the help of armoured vehicles and airborne troops in live military exercises. Some of these exercises also involve massed rocket and artillery fire that include vertically launched rocket and missile system for precision attacks equipped with terminal guidance sensors. During recent Doklam standoff, PLA conducted exercises at the lower plateaus of River Yarlung Zangbo (Brahmaputra in India), in which PLA mountain brigades participated to asses their operational readiness to undertake joint operations, entailing use of light tanks and missiles among other weapons[6]. The PLAAF also took part in these exercises, employing multirole air superiority J-10 fighters in ground-attack configuration using conventional and laser-guided bombs. These exercises are a critical pointer towards the Western Theater Command's preparations for joint and integrated operations.

China is also building conventional and strategic missile capabilities in Tibet as part of strategic deterrence against India. The proximity of the heavily populated provinces of Uttar Pradesh, Bihar as well as other eastern states in India, is a major strategic vulnerability for India. However, this equation is set to change, with India successfully inducting 3,500-km-range Agni 4 and 5,500-km-range Agni 5 medium-

range ballistic missile (MRBM) that would bring the entire Chinese coastal heartland in its range. Yet the strategic power differential between India and China will remain until these and other missile variants, including submarine-launched intermediate-range ballistic missiles (IRBM), are inducted in adequate numbers.

Prognosis of Chinese Threat

Developments in Tibet and Chinese behaviour during the Doklam standoff strengthens perceptions within the Indian national security establishment that China is consciously aiming to alter South Asia's strategic balance through military activism in Tibet and across India's neighbourhood, including active military and nuclear collusion with Pakistan. What has particularly alarmed India's political leadership is that despite years of tortuous boundary negotiations, nothing tangible has been achieved so far.

The manner in which the India-China matrix plays out over the next few decades will be dictated by perceptions of relative power and the geopolitics and balance of power. Having unveiled an agenda for creating China-centric global order backed by undisguised military power, it is apparent that China in pursuit of its rejuvenation and regional dominance agenda will brook no competition that attempts to undermine its rise. This is worrisome for India. Within the above construct, India, which is increasingly seen as the "Western linchpin" of US-led Indo-Pacific rebalance strategy, will face increasing Chinese pressure aimed at restraining its strategic choices. This could take the form of coercion along the disputed boundary or through proxies such as Pakistan. The scenario could get exacerbated if India under the present political leadership, equally interested in safeguarding its core interests, is perceived as posing a challenge or at best attempting to undermine Chinese interests.

Broader question, therefore, is that under what circumstances could India-China relations become competitive or even confrontational. China is neither a status quo nor a geographically satiated power, and will doubtlessly react politically and militarily should it feel threatened by inimical strategic shifts across Asia, such as India's economic and military rise or perceived changes in the balance of power as a consequence of growing strategic partnership with the US, Japan and Southeast Asian countries. India, on the other hand, is an equally proud civilisational power with an umbilical attachment to Tibet, besides being home to the Dalai Lama and 150,000–200,000 Tibetans in exiles. Therefore, it is not easy for India to fully concur with China over its sovereignty claims over Tibet, even though New Delhi has politically accepted Tibet as Chinese territory.

The geographical importance of Tibet to both countries seen in the backdrop of recent tensions over Doklam and vicious Chinese propaganda and pugnaciousness highlight that the undercurrents of tensions will prevail over the short to medium term. These are likely to get aggravated by growing India-US-Japan and possibly Australia strategic partnerships, and substantial upgradation of Indian military capabilities, including infrastructure in the border areas.

Tensions between the two sides could be aggravated (by design) through continuing Chinese intrusions and aggression, such as pushing for new claim lines or asserting old claims with greater stridency. These could be further boosted if China were to enhance its military activities in Pakistan-occupied Kashmir, upgrade military and nuclear relations with Pakistan, or attempt to make Nepal a third pressure point against India by building wider road and rail infrastructure and providing material military assistance. A further cause and proverbial red line will be if the Chinese were to succeed in undermining Bhutan's relationship with India. Yet another cause for tensions could be events following the death of the Dalai Lama and attempts by Beijing to foster its own nominee, eliciting wide spread protests from Tibetan émigrés in India and across the world.

Nature of Conflict

The operating environment along the India-China border is defined by two fundamental parameters, the terrain and the relative force balance. Vagaries of nature and high-altitude environment largely define the obtaining terrain environment. The terrain on the Chinese side is defined by Tibetan plateau and relatively low mountain ranges. This together with major infrastructural developments, that include road and rail communications as well as forward logistic installations, allow the Chinese Army to rapidly build up their forces and, even more importantly, maintain relatively limited deployment along the LAC (essentially border guards). Development of credible ISR infrastructure, fibre optics connectivity and forward deployment of battle field management systems and the availability of satellite connectivity in terms of C4ISR further allow greater synergy in force application. Integrated Western Theater Command, as highlighted earlier, ensures credible synergy both at operational and tactical levels. This is in contrast to three each army and air commands of India responsible for the China theater. Lastly, over the years, China has built forward deployed logistic supply chain and pre-positioning of logistic supply chain that can support offensive formations. This, coupled with enhanced strategic mobility provided by the Chinese civil aviation fleet, allows for rapid buildup of reserve formations from Central and other theaters from the mainland.

In contrast, India faces mountainous high-altitude terrain, with limited communications and impaired strategic mobility. Till about early 1990's, concerned about the Chinese buildup, road communications infrastructure along the Line of Actual Control (LAC) was purposely kept in an underdeveloped state as part of a "scorched earth" policy to prevent the rapid intrusion of the PLA into the plains of Assam in the northeast, much like in 1962. This has meant that India, unlike China, was and continues to maintain forward defensive deployment of forces in close proximity of the LAC. In contrast to the PLA, which holds back its Group Armies essentially for offensive tasks, Indian Army formations on the Western Sector (Ladakh), Central Sector (Uttarakhand) and Eastern Sector (Assam, Sikkim, Arunachal Pradesh) are essentially for ground holding to prevent intrusions and to maintain the sanctity and integrity of the LAC. This factor is one of

the major rationales behind India raising separate mountain strike corps and additional mountain formations to create a credible offensive capability.

Things however are beginning to change. Massive efforts have been made to upgrade communication infrastructure such as roads, rail connectivity and digital connectivity, for enhanced offensive options.

To enhance its ISR capabilities, India has deployed indigenous satellite-based global-positioning capability called the GPS-aided Geo-Augmented Navigation (GAGAN) system backed by autonomous regional navigation system called the Indian Regional Navigational Satellite System (IRNSS). These technologies provide India's military high positional accuracy for its weapon systems. To further increase its ISR capacity, the army is also inducting additional troops of Heron unmanned aerial vehicles (UAV) apart from the satellite-based information systems. Similarly, to ensure a high degree of communication security and connectivity, the military is planning a dedicated satellite-based defence network for the armed forces.

In addition, IAF is also developing a layered, hardened and in-depth air-defence command, control and communications network, titled the Integrated Air Command, Control, and Communications System (IACCCS). The IACCCS is a robust, survivable network-centric infrastructure that will receive real-time feeds directly from existing space-based overhead reconnaissance satellites, ground-based and aerostat-mounted ballistic missile early-warning radars and high-altitude-long-endurance unmanned aerial vehicles, and manned airborne early warning & control (AEW&C) platforms.

These developments and ability of rapid mobilisation of forces were largely responsible for effectively dealing with Doklam. The Indian Army was able to pick up Chinese moves, order timely reinforcements and undertake deployments that largely upstaged Chinese designs. It is important to note that even as conventional asymmetry prevails, it is being largely undermined by Indian strides in infrastructural build up, force modernisation and new raisings. One major disadvantage India faces is how to react to early signs of Chinese buildup which is both provocative and escalatory. A possible strategy to deal with this situation is discussed further in this paper.

There are potentially four theaters for conflict: Ladakh in Northern India, the Central Theater in Uttar Pradesh and Uttarakhand provinces, Sikkim, and finally along the McMahon Line in India's northeast. An all-out conflict, over territorial claims although possible, appears highly improbable because it could spiral into nuclear confrontation, upsetting the prevailing harmonious development model adopted by both sides. It is more likely that a conflict would be marked by a calibrated use of force and careful escalation management.

The use of force and nature of escalation would be driven largely by relative conventional and strategic balance and the Chinese leadership's perception of a "quick victory," besides the

political and military payoffs. Large perceived asymmetry could tend to enhance the motivation of unilateral assertion. A possible trajectory of escalation could be as follows:

- **Coercive muscle flexing and intimidation without resorting to the application of major force.** *This may entail mobilisation in local areas of conflict, creating favourable force ratios, targeted cyber attacks, support to groups engaged in asymmetric warfare, increased presence of the PLAN in the Indian Ocean and conduct of high intensity information warfare, as experienced during Doklam stand-off.*
- **Intermediate-Level Conflict: A limited war of high Intensity.** This scenario may entail coercive muscle flexing by launching limited attacks confined to areas of interest. These could be planned to be limited in duration and amenable to negotiated termination. Alternatively, it may entail surprise occupation of areas of strategic interest to drive a partial victory bargain. These actions would have the potential of escalating a limited conflict into a broader one, beyond the immediate theater (Eastern, Central or Western).
- **High Intensity limited War under `informationised conditions'.** Escalation to this level would be a deliberate decision with considerations of regional and global ramifications. Though unlikely, the option would need to be considered by the security planners conceptualising the transformation of Indian armed forces.

India's Response to the Chinese Challenge

India faces a unique security scenario involving two nuclear-armed neighbours with whom it has not only been to war but who together pose a collusive threat, creating a two-front war scenario.[7] Such preparation is easier said than done, given that this entails maintaining two-front credible capability. This poses a serious economic challenge in terms of the cost of conventional deterrence for a developing country such as India that depends largely on imported weapon systems.

This perspective has forced India's national security establishment and successive administrations to respond politically and diplomatically to the challenges posed by China. Nuclear weapons factored into the policy discourse of mutually assured destruction also help keep the conventional threat within manageable limits. The present Indian administration is however coming to the view that India cannot continuously live in the shadow of Chinese threat which could escalate to threatening levels if not managed adequately.

The current reasoning also underscores the necessity to develop credible "dissuasive" capability against China that has remained largely a dream, inadequately addressed by successive national security establishments. Concern is that military asymmetry could become too pronounced to be manageable if not addressed adequately and on time. The predictable time window is the next 10 to 15 years i.e., before the PLA becomes a fully integrated net-centric force together with development of connectivity corridors on India's Western (CEPC) and Eastern flanks (Nepal, Bangladesh, Myanmar).

Proposed Strategy against China

India's current doctrinal thinking vis-a-vis China is based on a strategy of credible defensive posture, which is essentially a defensive and limited offensive strategy based on large physical ground holding deployments backed by limited offensive capability created through raising a mountain strike corps. It encompasses a quid pro quo strategy by which any intrusion into the Indian territory would be answered with similar limited offensive operations in preselected areas. Such a capability encompasses intra-theater force rationalisation to create a quick response capability and include redeployment of forces presently deployed against Pakistan to the Chinese border. To execute this strategy, the infrastructure to perpetuate rapid mobility required is being created.

Unfortunately such a strategy is inadequate in the backdrop of increasing military asymmetry, China's ability of rapid force mobilisation and enhanced ISR capabilities and precision strike capability. Chinese strategy of subduing competitor without fighting and coercion is an extension of the concept of 'unrestricted warfare'. It works on leveraging ever widening asymmetry in comprehensive national power. India's approach in dealing with recalcitrant China must be the ability to target each instrument of China's national power. Toward this, India has to evolve its own doctrines, taking cognisance of relative asymmetry both in comprehensive national power, modernisation and technology. It is only through credible dissuasive posture through the heightened certainty of successful response that China will feel compelled to traverse the collaborative path.

Doctrine of Credible Response

Indian response must therefore focus on creating an effect to slow down Chinese theater deployments and preventing their rapid buildup by forcing them to operate from extended deployment lines. India's military strategy therefore needs to shift from entirely territorial defence to one based on developing capabilities and capacities that prevent adversaries' military buildup, thereby denying the PLA the ability to project power. To achieve this, it requires raising the cost of military intervention through the use or threat of use of means that are asymmetrical in form and disruptive in nature. The first impulse of the strategy is "area denial" akin to China's own AA/AD strategy.

The strategic construct 'to raise the cost of military intervention' is more political than military. The pre-emptive use of force in the face of credible and provocative Chinese buildup resides in the mind of political leadership, who alone will have to take the calculated risk in concert with other instruments of national power. It needs to be noted that this is not a punitive strategy but that of conflict prevention by simply developing capacities that have both the 'reach and potential' to raise the cost of conflict. Lastly, the threat of 'use of force' must not only be credible but also the 'value exchange' in terms of losses must weigh against the power projecting force. At the heart of this strategy is credible conventional deterrence that alone would force dissuasion to both intervene and to escalate. The objectives

of strategy can therefore be summarised as follows:

- Like China, put in place formalised structures for waging **psychological, media and legal warfare** that are equally active during peace, standoff and confrontation scenarios.
- Prepare to seize initiative at the early stages of standoff. This requires devising strategies that maximise relative strengths and create opportunities to exploit adversary's weaknesses, both at operational and strategic levels.
- Develop both physical capabilities and operational thinking to deter, threaten, (and should the need arise) strike and neutralise formations attempting to deploy opposite Indian borders. Value-exchanges of the engagement must be in India's favour.
- This also requires credible surveillance cover not only over Tibet over but complete continental China, through C4ISR capacities that transcend, optical, ELINT, COMINT and the associated means.
- Ability to degrade and deny key communication means to include railway and main road transportation arteries to delay and disrupt movement of forces. Similarly, develop capabilities to interdict forward and depth air bases during the critical stages to degrade trans-regional build up of forces. These capabilities form the core of Chinese force projection capability. The platforms of choice should be BMS of both short and medium caliber, long range cruise missiles, etc.
- To disrupt and disable operational networks through ASAT and active offensive cyber actions.

The intent to raise the cost of military intervention suggests developing a strategic posture that, through signalling and force dispositions, demonstrates resolve and intent that attempts at incursion or military intervention will far outweigh benefits if any, while maintaining the primacy of 'conflict avoidance'. The most critical aspect in execution of such a strategy is the "timing" and the "enabling circumstances" that would trigger India's response mechanisms. While the short answer, with some justification, will be **'when national interests are threatened',** it does not assist planners in resolving the quandary with any clarity. Two considerations must dominate decision making. First, the initial moves must be calibrated so that they unequivocally convey thresholds are being approached and that the next rung in the escalatory ladder could lead to a 'hot' exchange. This may take the form of 'signalling' or communications through back channels. The second could be demonstrative actions or even measures instituted in some other Theater where correlation of forces would suggest Indian superiority. Pre-emptive deployment during Doklam is an example.

Building Capacities and Capabilities

India's current capacity building perspective aims to close the widening gap of asymmetry with China by strengthening overall defensive posture. Under the Indian Army's 11th five-year defence plan (2006–11), two mountain divisions and an artillery brigade totalling 1,260 officers and nearly 35,011 soldiers were raised.[8] Importantly, these increases were in addition to the army's sanctioned manpower of 1.2 million personnel, and intended for exclusive employment along

India's eastern border with China. These formations are to be equipped with ultra-light, easily transportable M777 155-mm, 39-caliber howitzers from BAE Systems.

In addition, defensive formations both in the Eastern Theater and Ladakh are being provided with built-in rapid-reaction capabilities, including mechanised forces (armour and mechanised infantry). To facilitate a quick response to local contingencies attack and heavy-lift helicopters are also being acquired. New medium and heavy-transport aircraft using upgraded airfields and advance landing grounds along the border not only sustain deployed formations but also provide rapid build up capability.

India after much deliberation decision has created an independent limited offensive capability, based on a mountain-strike corps comprising two light mountain divisions and an artillery division armed with lightweight howitzers. Once it becomes fully operational, India will be able to field adequate offensive capability in almost all sectors along the LAC.

Lastly, there is the important issue of infrastructure development. Earlier, India followed a sort of scorched-earth policy of leaving the border regions underdeveloped; this has finally begun to change. Nonetheless, the pace of infrastructural development remains slow. Out of the total 73 Indo-China Border Roads approved for construction, only 27 have been finished while the remaining are expected to be completed by December 2022. Out of these roads, 46 are being built by the Ministry of Defence and the remaining 27 by the Ministry of Home Affairs. Delay in execution of the projects are multiple and include among others, environment clearances, hard rock stretches, limited working seasons, delay in land acquisitions, and damages due to natural disasters.[9]

The Doklam crisis has brought home the gravity of the situation. Consequently, plans are afoot to not only expedite work on these roads but to construct 17 highway tunnels (of a total distance of nearly 100 km) along the entire LAC to ensure all weather capabilities.[10] Once developed, it would significantly enhance India's mobilisation and logistic posture, and also facilitate the deployment of long-range assets such as the 90-km range Smerch multi-barrel rocket launcher (MBRL) and the indigenously produced 45-km range Pinaka MBRL systems. Deep strike capability is being further enhanced through the induction of BrahMos Block III steep-dive cruise missiles.[11] Also proposed is the induction of Prahar, the short-range battlefield missile with a 150-km range[12], which is part of the Indian Army's quest to acquire precision-guided munitions to augment its long-range lateral fire support.

To enhance Intelligence, Surveillance and Reconnaissance (ISR) capabilities, India has embarked on developing indigenous satellite-based global-positioning capability through an autonomous regional navigation system called the Indian Regional Navigational Satellite System (IRNSS), which is now being fielded. These collaborative technologies will provide India's military high positional accuracy for its weapon systems. To further increase its ISR

capacity, the army is also inducting additional troops of Heron unmanned aerial vehicles (UAV) apart from the satellite-based information systems. Indigenous Rustom MK I UAV's (under development) and possible induction of Predator armed UAV's will further enhance the Indian military's capability. To ensure a high degree of communication security and connectivity, the military is planning a dedicated satellite-based defence network for the armed forces. Tactical air-defence cover is also being improved with the induction of newly acquired Israeli low-level quick-reaction missiles to replace existing outdated systems.

Notwithstanding above developments, force transformational priorities need to be accorded to enhance asymmetric warfare capability with emphasis on Special Forces, cyber space, electronics and information warfare. Pace should match availability of resources and absorption capability. Doctrines, concepts and capabilities also need to be developed to counter state-sponsored terrorism and TNWs, at two ends of the hybrid warfare spectrum. Transformation needs to address the aspects of synergising conventional and strategic deterrence and war fighting to offset adverse force ratios.

In the maritime domain, force development needs to be optimised between the Navy, Coast Guard and Andaman & Nicobar Command (ANC). Primary and secondary Areas of Responsibility (AOR) of the Indian Navy (bounded by Gulf to the West and Malacca to the East OR beyond) need to be defined, for Out of Area contingencies to enable operationally oriented force structuring. Multifaceted capability development needs to be carried out for maritime reconnaissance, naval aviation (including UAVs), coastal defence, mine counter measure capability, sub-surface and anti-submarine warfare capabilities. A significant defining feature of the Indian Navy transformation would be to determine the overall approach to effectively secure the Indian Ocean between based either on carrier-based fleet or strong anti-submarine warfare capability backed by sentinels like the Andaman & Nicobar Islands. Concurrent to the conventional capability, development of the sea leg of triad-based on IRBM also needs to be developed on priority.

Transformation in the airpower domain must aim at evolving an overall concept of sharing service-specific integral air resources with the Army and the Navy for intimate support and development of the Air Force for employment in operational and strategic domain. Capability development of the Air Force must be based on visualised tasks, comprising of multi-role and role-specific fighter aircraft, with varying ranges and capabilities (mix of twin and single engine aircraft), AWACS, high endurance long-range remotely piloted aircraft (RPAs), transport aircraft and helicopters in various lift categories, airborne special operations and inter-Theater mobilisation capability for domestic and regional commitments. Appropriate precision and beyond visual range (BVR) weapons systems, suitable to the platforms, would also need to be inducted.

Conclusion

It needs to be underscored that with the rise of Chinese aspirations to create Sino-

centric regional order and India's developing comprehensive national power (CNP), clash of interest in inherent. This will be further aggravated by growing strategic convergence between India and the US and formulations such as 'Quad' and Indo-Pacific, seen by China as part of containment strategy.

Challenge from India can get aggravated if the growth of the Indian CNP, particularly economic growth and defence modernisation, begins to impact regional balance of power. Consequent changes in the Indian military power status, seen as shifting to one striving to "protect its strategic salience" in the South Asia and the IOR or emergence as a major geo strategic player in the Indo-Pacific, could aggravate these challenges.

Perception of growing asymmetry in military power will always be open to coercion and intimidation if there is clash of strategic interests with China. Despite years of negotiations, China has not settled the boundary dispute and holds it as domicile's sword. This should leave no one in doubt that undercurrents of conflict remain. It is in this context that this paper apart from analysing Chinese capacities and capabilities against India has tried to outline Indian capability and capacity development, including outlining a doctrine for raising costs of military intervention. The primer also outlines that the time for India to build credible deterrent capabilities is limited i.e. maximum of 10-15 years, thus it requires much more constructive approach to defence preparedness than the existing process oriented.

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7 MANAGING COMPREHENSIVE COMPETITION WITH CHINA: INSIGHTS FROM MULTI-DOMAIN BATTLE

ARZAN TARAPORE

Indian military planning has always centred on countering threats from Pakistan and China. Traditionally, the threat from Pakistan has commanded the most attention and resources—and with good reason, given the four wars fought by India and Pakistan, and Pakistan's territorial revisionism and perennial sub-conventional campaigns. Thus India has directed vast conventional forces and doctrinal changes at managing the security threats emanating from across its northwestern borders. But the strategic challenge from China, which has traditionally been experienced as a latent threat rather than active conflicts, has evolved rapidly in recent years. India has sought to respond to China's growing power—with new infrastructure and force expansion on the border, for example—but this response may not be adequate. How has China's military force modernisation changed the strategic challenges faced by India? And how should India plan to counter these evolving challenges?

In this chapter, I argue that China's recent force modernisation, defence reforms and assertive security policies amount to fundamental changes to India's strategic circumstances. The implications of these Chinese advances may ultimately be as significant as the realisation of Pakistan's nuclear weapons capability. Just as the Pakistani bomb forced India to reconsider and adjust how it deterred and fought wars against its western neighbour, the recent and current changes in the Chinese military should force India to reconsider and adjust how it manages security competition with Beijing. The fundamental difference between the threats from Pakistan and China, however, is that while the Pakistani threat is largely localised to India's continental periphery, forcing India to reinforce its territorial defence, the Chinese challenge is comprehensive, forcing India to reconsider its wider security policies. China is not only on India's Himalayan borders. It is in the waters and ports of South Asia, and the wider Indian Ocean Region from the Horn of Africa to the Strait of Malacca. It is in the cyber circuits of

India and its neighbours and partners; it is in space above Asia; and it is insinuated in the defence policies and strategic infrastructure of Pakistan and other regional states. This is a uniquely comprehensive security competition which India has never faced before, and which requires an unprecedented re-evaluation of India's defence posture.

In such a re-evaluation, Indian military planners could draw lessons from a US doctrinal concept known as Multi-Domain Battle (MDB).[1] The concept calls for an evolved form of networked, joint warfare, in which forces support each other across domains. It is still in its infancy, and riddled with as-yet unanswered uncertainties. Most importantly, it was devised for problems and circumstances particular to the US, so it cannot be transplanted wholesale to India or any other country, especially given India's doctrinal and bureaucratic inertia. But the concept does provide a framework from which Indian planners could learn as they grapple with their own particular problems and circumstances. In the remainder of this chapter, I first outline the scope of the emerging security competition with China; second, I explain the concept of MDB, drawing out its three most relevant insights; and finally, I offer the first steps of an outline for how it may be applied in India's case.

A uniquely comprehensive security competition

In August 2017, India and China agreed to disengage their forces from a two-month-long stand-off at Doklam.[2] The troops from each side had come face to face in a territory claimed by China and Bhutan, tensely maintaining their positions even while other units were placed on heightened alert, and other Indian and Chinese soldiers fell into scuffles elsewhere, on the Line of Actual Control (LAC). The crisis was defused diplomatically, and China's attempts to extend a road into contested territory were thwarted, at least for the time being. India had succeeded in restoring the status quo ante, even though Chinese forces subsequently began a build-up on their side of the border.[3] While much of the Indian strategic commentariat gloated at the apparent triumph, the crisis also notably hardened Indian attitudes against China.[4] Inflammatory threats from Chinese officials and occasional outright racist needling from communist party mouthpieces revealed to Indian audiences that China viewed India as a security competitor. Beijing under President Xi Jinping would pursue its aggressive territorial expansion not only against smaller disputants in the South China Sea, but also against India on their common land boundary.

The Doklam crisis therefore only reinforced long-held Indian views that the threat from China was a territorial threat along India's northern land border. Since India's humiliating defeat to China in the 1962 war, Indian military planners consistently feared further Chinese attempts to attack across or revise the LAC. Soon after the war, these fears were realised during a bloody skirmish at Nathu-La Pass in 1967. Even in wars against Pakistan in 1965 and 1971, India was wary of potential Chinese

intervention in support of its Pakistani ally. Since then, Chinese forces have launched several incursions along the disputed LAC, including a prolonged stand-off at Sumdorong-Chu (1986-87), and more recently at Depsang (2013) and Chumar (2014). In that context, the Doklam crisis of 2017—even though it involved territory claimed by Bhutan and not India—was of a piece with Chinese probes and consolidation of its Himalayan land boundary.

India's response to this perceived threat has been to expand its conventional ground and air defences near the border. Reversing decades of deliberate neglect after the 1962 war, India began a programme – albeit now grossly behind schedule – to upgrade and expand road infrastructure in border areas.[5] It also reactivated Advanced Landing Grounds and stationed its most advanced Su-30MKI multi-role fighters at bases facing the Chinese border.[6] Most significantly, it authorised the establishment of a new Mountain Strike Corps, designed to boost deterrence by threatening conventional retaliatory strikes into China, in 2013.[7] These Indian military preparations—and the threat perceptions upon which they are based—are all therefore designed around a conventional, ground-centric confrontation, supported by air power as required to defend or take control of land on the border.

But while India prepares its conventional defences, China has been posturing for a more complex security competition. The People Liberation Army (PLA) is rapidly modernising its force structure and doctrine to fight more mechanised and "informatised" conflicts.[8] It is developing a suite of indigenously-developed advanced weapons systems, some of which—such as anti-ship ballistic missiles, nuclear-powered submarines, and near-fifth generation fighter aircraft—would pose a serious threat even to the US military. Alongside this force structure, the PLA has been honing a military doctrine—which it calls "active defence" and US strategists have called "Anti-Access and Area Denial" (A2/AD)—designed to inhibit the US' ability to intervene militarily in a crisis or conflict involving China and a smaller regional state. Since the 1990s, the PLA has been developing its capability to fight what it calls "informatised" conflicts, wherein its forces would be enabled with better systems for command, control, communications, computers, intelligence, surveillance, and reconnaissance (C4ISR). Critically, it also seeks capabilities to disrupt those same data-networked systems in the enemy force. New capabilities in cyber and space—and, again, the disruption of those capabilities in the enemy—are central to this war-fighting doctrine.

More recently, in late 2015, China introduced a programme of organisational reforms in the PLA.[9] These reforms were designed to streamline command, enhance mobility, and increase jointness among the services. Thus, the PLA rationalised its seven army-centric Military Regions into five joint Theatre Commands, responsible for planning and fighting wars and maintaining higher routine readiness. It reformed its higher command, the Central Military Commission (CMC), into a flatter and more joint structure, less

dominated by the army and more responsive to political and strategic direction. It established a new military service, the PLA Rocket Force, which coordinates all land-based nuclear and conventional missiles. And it established new joint structures, such as the Strategic Support Force to unite cyber, space and electronic warfare capabilities in direct support of operational commanders; and the Overseas Operations Office, to coordinate expeditionary operations far beyond its immediate region. It implemented this restructuring while simultaneously demobilising 300,000 mostly non-combat troops, to develop a leaner, more mechanised and technology-intensive force.

The PLA has not only become more powerful with these changes in force structure, doctrine, and organisation; it has also pursued increasingly aggressive defence policies.[10] Most prominently, China has taken steps, beginning in about 2009, to press its territorial claims in the East and South China Seas, especially through the construction of artificial islands and the emplacement of military facilities on them. Closer to India, the PLA Navy began to extend its reach with routine operational deployments to the Indian Ocean. It sustained long-range anti-piracy operations in the Arabian Sea, and maintained such deployments despite the dissipation of the piracy threat.[11]

China's activities also challenge Indian influence indirectly, through a growing presence in regional states. Chinese military and state-owned enterprises have built and claimed varying levels of control over dual-use port facilities, in Gwadar in Pakistan, Hambantota in Sri Lanka, and soon in Kyauk Pyu in Burma.[12] Further, the PLA established its first-ever overseas military base in Djibouti.[13] These infrastructure advances, many of which could be modified to serve military uses, are well integrated into other elements of Chinese national policy. Its Belt and Road Initiative seeks to develop economic and political influence across Asia, often through "predatory" means.[14] Its investments, security cooperation activities, and arms sales—especially to Pakistan but also to Bangladesh, Sri Lanka and other nations—also build influence over regional states' policies.[15] Together, they amount to an ambitious plan to extend Chinese influence across the Indian Ocean littoral, developing military access and leverage in areas of vital national interest to India.

While Beijing protested for years that it was pursuing a benign "peaceful development," its declaratory policy has also now ditched the garb of meekness. Official policies have quickly grown bolder. Until recently, for example, the notion of overseas basing was anathema in Chinese military strategy, but now has become accepted. Most recently, at the 19th Party Congress in October 2017, Xi Jinping repeatedly declared that a well-prepared and globally active military would be central to the rejuvenation of the Chinese nation.[16] China is not simply accumulating military power, but declaring an intent to pursue competitive strategies against potential rivals in the region. With particular reference to India, China has

not only stepped up military activity on India's maritime periphery, but also clearly signalled its intent to directly oppose Indian policy on a range of issues.[17] It openly obstructed Indian membership of institutions such as the Nuclear Suppliers Group, blocked India's bid to sanction Pakistan-based terrorists, and threatened war over the Doklam border dispute. Frustrating Indian policy is now a part of China's broader bid for regional preeminence.

In sum, the security competition with China is unique and unprecedented in its complexity. India's historical threats had all been highly localised, emanating from highly predictable sources—either conventional border wars, infiltration by irregulars, or even complex but contained emergencies in East Pakistan and Sri Lanka. In contrast, the emerging strategic challenge from China spans locales and domains. It surrounds India geographically and involves all instruments of national power. And China's recent military reforms lend it not only greater capabilities, but the command arrangements to deploy them jointly. This is a novel and uniquely comprehensive challenge that requires novel Indian solutions.

Insights from Multi-Domain Battle

To meet its own military challenges, the US military has developed a new doctrinal concept known as Multi-Domain Battle (MDB).[18] While still in development, the concept is designed to addresses an urgent US need to regain operational advantage against its near-peer competitors, China and Russia. These competitors have developed technologies and doctrines that could effectively neutralise much of the US' recent superiority – especially by blocking US access to battlefields, disrupting its networked force, and using "grey zone" techniques to achieve objectives without crossing the threshold of conventional conflict. In response, MDB is designed to evolve the concept of joint war fighting, by more deeply integrating operations in the three traditional domains of battle—land, sea, and air—alongside the two other increasingly essential domains of cyber and space. It calls on forces to be able to operate independently—with their supporting C4ISR networks disrupted by the enemy—but then also to converge, across multiple domains, to create "windows of advantage" to manoeuvre and achieve effects against the enemy. It recognises that against near-peer adversaries, the US will not enjoy, for example, uncontested air superiority or undisturbed C4ISR networks, as it has in recent decades. Competing or deterring—or, ultimately, fighting—a powerful military such as the PLA requires a mutually-supporting combined arms approach across multiple domains, and an ability to exploit fleeting advantages.

MDB is, then, a particular US solution to particular US challenges, rather than a template that can be readily emulated by others. It is an evolution of earlier doctrines and concepts, such as AirLand Battle, rather than a revolutionary concept. Nevertheless, it offers three key insights that could be usefully applied to India's strategic challenges.

First, it offers an evolved understanding of jointness. MDB does not advocate simply the coordination of operations between services, or even the integration of services at the seams of domains, such as in amphibious operations or close air support. Rather, by focusing on the domains rather than the services, MDB calls for all services to operate wherever possible and necessary, in all domains. It assumes all domains may be contested, and friendly forces will therefore require supporting fires from other domains. And, as with the principle of combined arms, converging fires from multiple domains can impose invidious dilemmas on enemy commanders—where avoiding one threat makes the enemy vulnerable to another.[19] The MDB concept, which originated in the US Army, pays particular attention to the support that land-based forces can provide in other domains, especially with the use of ground-based missiles against enemy air, maritime, or space targets. It also requires a new information architecture to integrate forces across domains so that they can share a common operating picture and common fire control systems. In the absence of such an architecture, for example, even the highly networked US military cannot readily use shore-based missiles to support naval forces.[20]

Second, MDB suggests that military forces can and should more readily threaten the enemy's "deep", or rear, areas; while taking steps to protect their own deep areas from enemy cyber attacks, long-range strike, or other disruptions. Technological advancements and the changing character of war have altered the battle space: it has now expanded, with wider area and more actors; it has converged, between military action and non-military action such as political and information warfare; and it has been compressed, with long-range weapons that can accurately attack distant targets. There is, in other words, less distinction between close and deep, or forward and rear, areas.[21] This is especially true for regionally-active major powers like China and India, whose forces are not oriented linearly against each other as on a conventional battleground, but arrayed across a wide region such as the Indo-Pacific. In such a case, deep areas are still those which are more difficult to reach or politically more sensitive, but could still be threatened, especially through other domains. For example, for the India-China security competition in the Indian Ocean Region, the South China Sea may reasonably be considered to be China's deep area.

Third, MDB notes that, even in the absence of open war, states are engaging in increasingly intense security competition. Revisionist powers such as Russia and China have increasingly used "grey zone" military activities to coerce adversaries and impose *faits accomplis* to incrementally make strategic gains, without provoking a conventional war.[22] China, for its part, has used its "three warfares" doctrine to gain territory and subdue potential foes.[23] In response, MDB suggests that deterrence is not created by a static correlation of forces – as it may have been in the Cold War – but through constant, dynamic activity. This security competition

involves multiple domains and multiple instruments of military and political power – including, for example, information operations, which take on added importance in non-war competition. In this persistent competition, as in war, where all domains are constantly contested, states can only hope to achieve fleeting "windows of domain superiority" – and only an agile multi-domain force can spot and exploit such opportunities.[24]

These three insights suggest a blurring of traditional distinctions. The character of war is changing – with less distinction between ground-air-sea forces, less distinction between close and deep areas, and less distinction between peace and war. The nature of war remains unchanged – subject to chance, unpredictability, and extreme violence. And no military doctrinal concept can obviate the need for a sophisticated political strategy, addressing domestic support and the international environment. But MDB offers some insights into how the wars, and especially the non-war security competition, of the future will be fought. MDB has been introduced into published US Army doctrine,[25] although it remains a work in progress, still undergoing testing, evaluation, and refinement. Full implementation will require years, with new force postures and supporting systems. Nevertheless, some of its key insights may be useful for India as it struggles with the comprehensive challenge of China.

Applications for India

The Indian military has traditionally planned for a Chinese threat in a fixed locale and domain, a principally ground threat at the India-China border; but the potential threat is rapidly evolving.

Consider the following scenario. A Chinese nuclear submarine is detected when it surfaces 25 km off the coast of Kolkata. Separately, a small group of men, bearing small arms and explosives, breach perimeter security at Tezpur and Chabua air bases in Assam. The Headquarters of the Army's Eastern Command, in Kolkata, suffers a distributed denial of service attack, which cripples its computers and some communication circuits. These events could occur simultaneously, or they could occur in sequence, to ratchet up coercive pressure. The incidents are obviously known to the units involved—and probably to the respective operational commands of the Navy, the Air Force, and the Army, respectively—but not publicised, for operational security reasons. At which level of military organisation would the Indian military integrate a common threat and operations picture, in which these three events, occurring in the same region but in three different domains, are seen as part of a wider campaign? And, accordingly, how long would it take for other Indian units to coordinate defences and, if necessary, prepare a response?

In the absence of a joint operational-level command—such as the US Combatant Commands or the PLA Theater Commands—the Indian military's situational awareness is fragmented, and its ability to command fast and coordinated responses is hobbled.

The Indian military's pathological aversion to jointness is well known.[26] The single-service approach to planning and doctrine has been tolerated because it imposed relatively little operational cost—India's past conflicts have been largely land wars in limited locales, where more effective jointness would have made little difference to the outcome.

Faced with the new comprehensive security competition with China, however, these old habits will become exceedingly costly. To strengthen deterrence and war-fighting capacity, the Indian military could apply insights from MDB, as I outlined above, in three mutually-reinforcing ways. First, by creating the structures and practices of combined arms across multiple domains. Second, by demonstrating an ability to threaten China's deep areas rather than responding directly in the same locale and domain. Third, by planning for and pursuing competitive strategies to deter and counter Chinese coercion and expand influence without direct hostilities.

In the scenario above, the aggressor was exploiting current seams between India's military services. Building structures and practices of a joint operational command would allow Indian forces to fuse a multi-domain picture of threats, and to deploy force with integrated supporting fires from multiple domains. This fusing of command would significantly improve India's deterrent against minor acts of aggression (or "grey zone" activity) below the level of open war, because it would eliminate unnecessary seams, allowing India to quickly recognise and react to adversary action.

At the same time, India could also enhance deterrence by demonstrating its ability to contest China's deep areas, and impede China's access to India's deep areas. China's expanding military footprint across the Indo-Pacific creates vulnerabilities, a fact recognised by the Indian Navy's 2015 doctrine.[27] The PLA Navy's routine presence in the Indian Ocean has increased its reliance on free passage through the Strait of Malacca. India's Andaman and Nicobar Islands offer a well-situated lily pad to observe or potentially dominate the Malacca choke point.[28] A more fortified Andaman and Nicobar chain could be developed to lay an anti-access screen, or even to project Indian power eastward, towards China's deep areas inside its "first island chain". In fact, emplacing air defence and cruise-missile forces in the Andaman and Nicobar chain would be a textbook case of ground-based forces achieving effects in other—air and maritime—domains.

The PLA's extended lines of communication across the ocean, and its base in Djibouti, offer Indian forces other opportunities to contest and disrupt Chinese activity, as the Indian Navy develops greater sea denial capabilities. The MDB concept reveals how India can build coercive or counter-coercive leverage in one domain to deter or compel Chinese behaviour in another. Thus, India's aspirational sea denial capabilities in the Indian Ocean are not simply direct threats to the PLA Naval assets involved, but could also be a powerful deterrent against

other potential Chinese military action. For that deterrent to be effective, however, Indian forces must have multi-domain situational awareness and command authorities. Sea denial in the Indian Ocean would, for example, require fused space, air, and ground-based intelligence, surveillance and reconnaissance, besides land-based screening of choke points and a resilient cyber architecture to network the components together.

What tasks and reforms would India require to realise this vision of MDB-based operations? A full exposition lies outside the scope of this chapter, but it could include major changes to India's force structure, network technology, doctrine, and personnel training. Many of those changes are probably unrealistic, given bureaucratic inertia, but India can still reap some benefits from the MDB concept without such wholesale change. At a minimum, the MDB concept would require reorganisation of India's single-service command structures into joint structures, both at the highest level, with a Chief of Defence Staff, and equally importantly, at the operational command level. This way, the MDB concept joins a chorus of other sound reasons for this long overdue reorganisation.

Such a vision of an Indian adoption of MDB principles may seem fanciful; the services remain remarkably resistant to jointness. They have resolutely refused to accept the creation of a Chief of Defence Staff, despite repeated official recommendations and strident scholarly argument. Prime Minister Narendra Modi had made right-sounding statements, but the military has not had any incentive to follow through. The recent decision to establish "joint" agencies—for space, cyber and special operations forces—offers little hope for progress.[29] Echoing the experience of the failing Andaman and Nicobar Command experiment in jointness,[30] the services will probably jealously retain much or most of their existing capabilities in these areas, thus denying the new agencies the resources or authorities to independently execute their mission. Nevertheless, the MDB concept may offer the most compelling reasons in decades to seriously consider joint operational commands. It remains unclear whether India could apply the MDB concept—through *jugaad* (frugal innovation), perhaps—in the absence of the necessary command structures.

Conclusion

Previous instances of major defence reforms occurred only after conflicts—the defeat against China in 1962 and the shock of the Kargil incursion in 1999. The evolving security competition with China may not create such a discontinuous shock event; indeed, Chinese strategy deliberately seeks to accrete gains without triggering a costly conflict. Nevertheless, the competition is underway and growing more complex, with Chinese gains in power and aggressiveness. India's existing structures are not adequate to provide the situational awareness and response options required in this competition. The doctrinal concept of MDB offers some insights on how India could strengthen is deterrence and relative power given its current force structure. It is far from a complete solution to

security competition, which would require a suite of military modernisation, non-military efforts, and partnerships with other states. Meanwhile, while those long-term efforts are in progress, the Indian military has urgent reasons to organise and posture in a way that allows its forces to operate across domains, and in China's deep areas. The costs of persisting with India's single-service, territorial-defence mindset will no longer be marginal. Indeed, in the new security competition, new joint organisations and doctrine may be decisive.

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8 VIRTUAL DOMAINS AND REAL THREATS: CHINESE MILITARY CAPACITIES IN NEW FRONTIERS OF WARFARE

ELSA B. KANIA

In the context of complex, often contentious, Sino-Indian relations, the rapid modernisation and advancing capabilities of the Chinese People's Liberation Army (PLA) could pose a range of threats to India in a crisis or conflict scenario, including in space and cyberspace. As the PLA undertakes historic organisational reforms, seeking to advance its capability to fight and win future informatised (信息化) wars, the advancement of new forces and capabilities for information warfare have emerged as clear priorities. In particular, the restructuring and integration of Chinese space, cyber, electronic and psychological warfare capabilities to create the Strategic Support Force (战略支援部队, SSF) in December 2015 appears to mark the start of a new era for Chinese military power, as a crucible for these critical new forces.[1] Concurrently, the PLA is also closely tracking trends in the changing character of warfare, prioritising—at the highest levels—defence innovation in emerging technologies and actively advancing dual-use developments, including unmanned systems, artificial intelligence, and quantum technologies. Looking forward, assessments of the future trajectory of the China-India military balance should be informed by these trends.

A New Force for China's 'New Era'

As the PLA seeks to transform itself into a "world-class' military able to 'fight and win' future wars, the SSF has emerged as an integral element of its capabilities to seize information dominance and undertake integrated joint operations. At a basic level, the SSF has combined previously disparate operational units responsible for strategic space, cyber, electronic and psychological warfare capabilities, primarily from the former General Armaments Department (GAD), the General Staff Department (GSD) and the General Political Department (GPD) into a new *budui* (部队).[2] The SSF is intended to serve as an incubator for key strategic capabilities that will fall under the direct control of the Central Military Commission (CMC), while supporting the PLA's regional Theater Commands (战区).

The SSF appears to be composed of two subordinate combat forces, seemingly referred to as the Space Corps (天军) and Cyber/Net Corps (网军). These new forces fall under the aegis of two departments that will serve as headquarters and take responsibility for force-building efforts. The SSF's Space Systems Department (航天系统部) has consolidated vital space-based and space-related assets, including a critical mass of key satellites, and might also take responsibility for the advancement of Chinese counter-space capabilities. Concurrently, the Network Systems Department (网络系统部) has integrated elements of the former GSD Third Department (3PLA), responsible for technical reconnaissance and cyber espionage, and the Fourth Department (4PLA), which took the lead in electronic warfare and offensive cyber capabilities.

It is important to note that the SSF is not the only component of the PLA's information warfare capabilities. The CMC Joint Staff Department Network-Electronic Bureau (网络电子局), which oversees the joint Network-Electronic Countermeasures *Dadui* (网络电子对抗大队), appears to be built upon former 4PLA headquarters.[3] This high-level entity could be a joint force responsible for strategic cyber and electronic warfare capabilities that may act in conjunction with (or potentially even exercise command over) the SSF, given that it falls directly under the aegis of the new CMC Joint Command Centre itself. The PLA may also be building up network-electronic combat capabilities within the PLA's new Theater Commands (战区).[4] Meanwhile, the PLA's individual services may retain their own technical reconnaissance bureaus and at least limited information operations capabilities, such as electronic countermeasures units. At this point, it remains to be seen how coordination will be facilitated among these various units. However, given the strategic potential and sensitivity of these capabilities, the CMC will likely exercise direct control over their operational employment.

The SSF has been designed to facilitate the integration and advancement of PLA capabilities in the new 'strategic frontiers' of warfare that are space and cyberspace. Indeed, the SSF is consistently characterised as a "growth point" for the construction of such "new-type" forces (新型力量).[5] Previously, at the organisational level, silos and stove-piping among the PLA's space, cyber, electronic and psychological warfare capabilities had impeded their integration as an effective combat force.[6] However, the SSF's force structure appears to reflect a precursor to the undertaking of more far-reaching changes that could result in the restructuring and reorganisation of existing units, perhaps along with the creation of entirely new units.[7] According to its commander, Lieutenant General Gao Jin (高津), the SSF will "protect the high frontiers and new frontiers of national security," seeking to "seize the strategic commanding heights of future military competition."[8]

New Challenges in a Virtual Domain

The PLA's advancement of its ambitious military modernisation agenda through the SSF could create new security and strategic challenges for India. In particular, the SSF will advance

the PLA's capability to provide information support (信息支援) to joint operations. That is, it is responsible for engaging in intelligence, surveillance and reconnaissance within the space, cyber, and electromagnetic domains, acting as an "information umbrella" (信息伞) for the PLA as a whole.[9] In this regard, the SSF is intended to enable "system of systems integration" (体系融合) for the PLA, facilitating the sharing of information and intelligence throughout the "information chain" of military C4ISR systems.[10] In any crisis or combat scenario, the SSF would thus serve as a critical enabler of the PLA's ability to project power, not only to conventional but perhaps also in support of nuclear forces. Concurrently, a critical mass of the non-kinetic counter-space capabilities, such as jamming and likely directed-energy weapons, and potential kinetic counter-space capabilities that could target an adversary's space-based ISR systems may also fall under the aegis of the SSF.[11]

The SSF will also be critical to the PLA's capability to seize information dominance (制信息权) in future informatised (信息化) local wars. At a core level, the PLA's strategic and doctrinal approach to information operations, which it defines as composed of cyber, electronic and psychological warfare,[12] has remained relatively constant since the 1990s. However, these recent adjustments to force structure may be poised to create a more cohesive combat force able to actualise such a highly integrated approach across disciplines and among the domains of space, cyberspace and the electromagnetic domain. Through its unprecedented combination of these capabilities, the SSF could become uniquely capable of taking advantage of cross-domain synergies resulting from the technological convergences of operations in these domains, from cyber attacks on or jamming of enemy space systems to electronic warfare-enabled cyber attacks that could "bridge the air gap" to target the isolated battlefield networks of enemy systems, along with targeted psychological warfare.[13] Beyond clear conflict scenarios, the PLA might also seek to leverage its cyber capabilities, perhaps even engaging in low-level cyber attacks, in an attempt to achieve cyber deterrence (网络威慑), which is starting to be seen as an integral element of its overall strategic deterrence posture.[14]

The PLA recognises the vital importance of battlefield information superiority (战场信息优势) to victory. In a conflict scenario, its strategic and doctrinal approach to information operations would be informed by its military strategy of active defence (积极防御), which is strategically defensive but tactically and operationally offensive.[15] Given the structural offence dominance of the space and cyber domains, the PLA could tend towards a preemptive orientation towards a first-strike (先发制人) approach to seize the initiative.[16] In practice, to do so, the PLA would undertake prior 'preparation of the battlefield' through cyber reconnaissance. The blurred boundaries between such reconnaissance, which can be almost indistinguishable from routine cyber espionage, and the associated offensive capabilities contribute to further erosion of the boundaries between peacetime and wartime capabilities.[17] The PLA's concept of "cyberspace military struggle" conveys the notion that political and military conflict in this domain

occurs continuously along a spectrum between peace and warfare.[18] By the characterisation of influential PLA strategist Ye Zheng (叶征), "The strategic game in cyberspace is not limited by space and time, does not differentiate between peacetime and wartime, [and] does not have a front line and home-front…"[19]

At the campaign level, the PLA's perceptions of the potential adversary in question would influence its priorities and targeting. For instance, Ye Zheng argued in his influential PLA textbook, *Lectures on the Science of Information Operations,* that the guiding ideology for information operations should evolve in accordance with the characteristics of the adversary. If facing a "formidable enemy," such as the US, then there should be an emphasis on active defence in information operations; against a weaker enemy, an active offensive should rapidly achieve battlefield information superiority.[20] This reasoning reflects a realisation that vulnerability to a more powerful adversary's information counterstrike results in an imperative for defence, and that offence alone is inadequate. By this logic, it appears that the PLA's assessment of the Indian military's strength, particularly its capability to undertake a cyber counterattack against Chinese networks, would inform its decision whether to focus on defending its own systems or seek to seize immediate superiority through a more coercive approach. Inherently, a paradox of PLA modernisation is that its advances in informatisation tend to increase its capability but also create new vulnerabilities that might be exploited by a competitor.

As the PLA's forces and capabilities for information operations remain under construction, the recruitment of talented personnel will be a priority and key indicator of advances. Indeed, China's national military-civil fusion strategy has highlighted cyberspace as a priority, with a particular focus on personnel training and issues of human capital.[21] For instance, the SSF has established partnerships with over nine units and enterprises, such as the University of Science and Technology of China and the China Electronics Technology Group (CETC), to focus on "fostering high-end talent," including through education, training, cooperation, and exchanges.[22] In some cases, there could even be attempts to leverage non-military talent and capability more directly. For instance, an authoritative PLA text, the 2013 *Science of Military Strategy*, argued, "since the boundaries between peacetime and wartime are ambiguous, and military and civilian attacks are hard to distinguish, persist in the integration of peace and war [and] in the military-civil fusion; in peacetime, civilians hide the military, [while] in wartime, the military and the people, hands joined, attack together…"[23] Indeed, the SSF is designed to achieve dominance in a domain in which traditional boundaries are blurred and the private sector has become integrally involved.

Emerging Technologies and Future Capabilities

As the character of conflict is transformed by the advent of robotics and artificial intelligence (AI) on the battlefield, the PLA recognises and seeks to capitalise upon the trend towards "unmanned, intangible, silent warfare" ("无人, 无形, 无声"战争) that is increasingly "intelligentised" (智能化).[24] Consequently, the

PLA has pursued advances in military robotics and 'unmanned' (i.e., uninhabited) systems. To date, the PLA has fielded a range of unmanned aerial vehicles (UAVs), while also developing and, to a limited extent, fielding unmanned underwater vehicles (UUVs), unmanned ground vehicles (UGVs), and unmanned surface vehicles (USVs).[25] For instance, the PLA Air Force employs the GJ-1 (*Gongji*-1, 攻击 - 1), a medium-altitude long endurance (MALE) UAV roughly analogous to the US Predator, for use in integrated reconnaissance and precision strike, and may soon introduce the GJ-2, a successor that is closer to the Reaper in capabilities. The PLA Navy operates the BZK-005, primarily for surveillance, along with more tactical systems like the ASN-209 for communications relay and electromagnetic countermeasures. Concurrently, the Chinese defence industry is actively pursuing research and development for a range of cutting-edge unmanned systems, including those with stealth, supersonic and swarming capabilities. In the PLA's efforts to assert and defend China's territorial claims, the use of unmanned systems could serve as a 'tip of the spear' to introduce persistent presence into disputed waters or territory.

Looking forward, the PLA's pursuit of defence innovation in key emerging technologies could enhance its future capabilities. At the highest levels, Chinese leaders are advancing a strategy of "innovation-driven" development,[26] particularly focusing on advances in big data, AI, and quantum science, among others. During the 19th Party Congress, Chinese President Xi Jinping articulated the ambition to build China into a "science and technology superpower" (科技强国).[27] His recent remarks have highlighted rapid, revolutionary advances in AI and quantum technologies, and called for further breakthroughs.[28] According to the New/Next Generation Artificial Intelligence Development Plan (新一代人工智能发展规划), China aspires to "lead the world" in AI and seeks to become the "premier global AI innovation centre."[29] To date, China has also emerged as a powerhouse in quantum information science and aspires to lead the "second quantum revolution," with the advent of uniquely powerful technologies.[30] The PLA recognises and seeks to take advantage of the disruptive military potential of these technologies, including through China's national strategy of military-civil fusion (军民融合).[31]

The PLA aspires to change paradigms of military power in the AI revolution, hoping to leapfrog ahead of the US and achieve a decisive advantage relative to regional rivals in the process. According to Lieutenant General Liu Guozhi (刘国治), Director of the Central Military Commission's Science and Technology Commission, AI will accelerate the process of military transformation, causing fundamental changes to military units' programming, operational styles, equipment systems and models of combat power generation, ultimately leading to a profound military revolution.[32] He warns, "facing disruptive technology, [we] must … seize the opportunity to change paradigms (弯道超车); if you don't disrupt, you'll be disrupted!"[33, 34] The Central Military Commission Joint Staff Department has called for the PLA to leverage the "tremendous potential" of AI in planning, decision support

and operational command.[35] In addition, the Joint Staff Department has called for the application of big data, cloud computing, AI and other cutting-edge technologies in the construction of a joint operations command system.[36] Building upon its ongoing agenda of informatisation, the PLA is seeking to advance "intelligentisation" (**智能化**) as the next stage in its modernisation efforts, seeking to leverage AI as a force multiplier for its future combat capabilities. China is advancing in research and development for a range of military applications of AI, including intelligent and autonomous unmanned systems; AI-enabled data fusion, information processing, and intelligence analysis; war-gaming, simulation, and training; defence, offence, and command in information warfare; and intelligent support to command decision-making, among others.

Concurrently, China's rapid advances in dual-use quantum technologies could also have long-term military and strategic implications.[37] To date, China has emerged as a clear leader in research and development on quantum cryptography, while constructing a national quantum communications infrastructure that will secure sensitive military and government communications against potential adversaries' signals intelligence and cyber espionage capabilities.[38] Notably, China's leading quantum physicist Pan Jianwei (**潘建伟**) has claimed, "China is completely capable of making full use of quantum communications in a local war. The direction of development in the future calls for using relay satellites to realise quantum communications and control that covers the entire army."[39] Although US teams continue to lead in quantum computing, China is a relative latecomer that has started to rapidly advance in this race, or more likely marathon, to develop these uniquely powerful computing capabilities that could break most existing forms of encryption. In addition, the Chinese defence industry is pursuing a range of projects for research and development of quantum sensing and metrology, including quantum radar, which could potentially undermine stealth capabilities, and quantum navigation, which could serve as a substitute for GPS. Although the trajectory of these technologies remains to be seen, their potential to disrupt existing military, and even strategic balances of power should not be discounted.

The Future of Chinese Military Power

Although the future trajectory of Chinese military modernisation remains uncertain, the PLA is evidently undertaking historic organisational reforms that could advance its capabilities in information support and information warfare while pursuing rapid advances in such critical emerging technologies as AI and quantum science. The Strategic Support Force's establishment appears to mark a milestone in the history of PLA space, cyber, electronic and psychological warfare that may enable their unique integration to enhance combat power in these new frontiers of warfare. In any crisis or conflict scenario, such capabilities would almost certainly be at the forefront of Chinese military might. For instance, the PLA could seek to exert further pressure upon the Indian military through the use of UAVs in disputed territories, probing and

preparing to attack sensitive military information systems through cyber means, and targeting military space assets with cyber or electronic warfare, perhaps prior to any outright outbreak of hostilities. Certainly, Chinese military ambitions may not be fully realiszed, and the PLA may face a range of obstacles not only in the course of complex, disruptive reforms but also in its attempts to adapt and integrate technological innovations into its culture and force structure. Nonetheless, it is clear that PLA advances in capabilities in these new virtual domains could pose real threats to potential competitors.

1: This piece is informed by and draws upon the author's prior writings on the SSF, which include the following: Elsa Kania, "China's Strategic Support Force: A Force for Innovation?" *The Diplomat*, February 18, 2017, http://thediplomat.com/2017/02/chinas-strategic-support-force-a-force-for-innovation/. Elsa Kania, "PLA Strategic Support Force: The 'Information Umbrella' for China's Military," *The Diplomat*, April 1, 2017, http://thediplomat.com/2017/04/pla-strategic-support-force-the-information-umbrella-for-chinas-military/. Elsa B. Kania and John K. Costello, "The Strategic Support Force and the Future of Chinese Information Operations," Cyber Defense Review, spring 2018, forthcoming. Please see also the writings of John Costello on the topic, including: "The Strategic Support Force: China's Information Warfare Service," *China Brief*, February 8, 2016, https://jamestown.org/program/the-strategic-support-force-chinas-information-warfare-service/. John Costello, "The Strategic Support Force: Update and Overview," *China Brief*, December 21, 2016, https://jamestown.org/program/strategic-support-force-update-overview/.

2: For a more detailed account of force structure, see: John Costello, "The Strategic Support Force: Update and Overview," *China Brief*, December 21, 2016, https://jamestown.org/program/strategic-support-force-update-overview/.

3: This assessment was made based on Chinese language open sources, which are available upon request.

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9: http://military.people.com.cn/n1/2016/0124/c1011-28079245.html

10: Ibid.

11: For instance, the Network Systems Department likely possesses advanced electronic warfare capabilities and potentially directed energy weapons, and the SSF is also involved in the testing of kinetic

counterspace capabilities. Further sources are available upon request.

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16: Academy of Military Science Military Strategy Research Department [军事科学院军事战略研究部], eds., *The Science of Military Strategy* [战略学], Military Science Press [军事科学出版社], 2013.

17: Ibid.

18: According to the PLA's official dictionary of military terminology, "military struggle" is defined as 'the use of military methods in order to advance the struggle among nation-states or political groups to achieve a definite political, economic, etc. objective; the highest form is warfare.'

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9 NUCLEAR WEAPONS AND SINO-INDIAN SECURITY RELATIONS

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The editors asked us to respond to the following question: Do nuclear weapons have a role in the Sino-Indian dyad? The answer, we believe, is a resounding yes.

As we explain below, China is India's primary long-term strategic challenge. Nuclear weapons provide India an important measure of insulation against growing Sino-Indian power asymmetries and coercive Chinese behaviour in the Indo-Pacific region. Thus, despite India's doctrinal commitment to minimalism, and considerable costs and risks, India is increasing its nuclear capabilities and will continue to do so for the foreseeable future. Such efforts to enhance the efficacy of its nuclear deterrent vis-à-vis China could even lead India to reconsider its commitment to no first use.

Since the 1998 nuclear tests, South Asia has often been characterised as a nuclear flashpoint; Former US President Bill Clinton called it "the most dangerous place on earth" on the eve of his first visit to the region.[2] Some have argued that such rhetoric is overblown, while others maintain that the danger is real.[3] Most of this debate has focused on the Indo-Pakistani dyad. There are good reasons for this: the two states have fought four wars against each other and have had numerous standoffs under the shadow of nuclear weapons. The relationship continues to be tense, with Pakistan-backed non-state actors threatening to ignite a conflict, potentially without explicit instructions from their sponsor. India's patience with Pakistani provocations has worn thin, and the potential for a militarised response that moves up the escalation ladder relatively rapidly cannot be ruled out. Pakistan's introduction of new nuclear-capable delivery systems in pursuit of "full-spectrum deterrence" adds to this danger. Particularly worrisome is Pakistan's development of short-range battlefield nuclear weapons, which are likely to be deployed early in a conflict alongside conventional forces, with launch authority pre-delegated at some stage of a crisis. This capability could increase the credibility of Pakistani first-use threats, but it increases the likelihood that even a relatively small conflict could become nuclear in a short

period of time.[4]

With so much focus on Pakistan, India's relationship with its other nuclear-armed neighbour, China, is often overlooked. From a strategic standpoint however the Sino-Indian relationship is more important. Pakistan can potentially engage in very costly behaviour, but it is not a peer competitor and does not present India with a long-term strategic threat. Pakistan suffers from too many handicaps, including economic stagnation, sectarian and ethnic strife, political instability, and limited territorial and human resources. Pakistan's military, though formidable, is primarily defensive and land-oriented, designed to prevent India from leveraging its conventional superiority to execute a catastrophic cross-border attack. Pakistan will never be powerful enough to seize large portions of Indian territory, achieve coercive leverage over India, or remake the regional architecture of the Asia-Pacific region.[5]

China, by contrast, could potentially do these things. While China's economic growth has cooled from the double-digits of the last two decades, its Gross Domestic Product (GDP) is approximately $9 trillion, with a seven percent growth rate in 2017.[6] India's GDP, by contrast, is only about $2 trillion, and is growing at about five percent per year. China's economic expansion has fuelled increased defence spending and facilitated the creation of a more powerful military. The Chinese defence budget for 2017 is approximately $151.43 billion, which is roughly three times that of India, and represents a seven percent increase over 2016.[7] China outmatches India across the spectrum of military capabilities, with an active-duty military approximately 1.8 times as large as India's, 1.8 times as many fighter and attack aircraft, over four times as many submarines, 2.5 times as many overall naval assets, 1.5 times as many tanks, and more than twice as many nuclear warheads.[8] While these forces are not all directed at or deployable against India, they create a significant overall disparity between the military might of India and China.

China's prowess is likely to grow further as it devotes more resources to defence in the coming years. China appears likely not only to continue to outspend India, but to become the world's largest military spender in the next two decades. The Chinese leadership has stated explicitly that China's military must modernise itself by 2035 and become a world-class fighting force by 2050. This will require not just quantitative improvements, but qualitative advances as well. To develop a world-class military, China will need to acquire more advanced technology, improve its naval as well as border and defensive forces, increase its capacity for joint operations between military branches, resolve its civil-military integration challenges, and generate a more innovative, combat-capable cadre of senior leaders.[9]

Despite these advances and ambitions,China's challenge to India and the region is, in general, not overtly militarised. Rather, China has used ventures such as the Belt and Road Initiative, which includes finance and infrastructure development projects reaching from Djibouti to Southeast Asia to complement increasingly competitive behaviour—territorial reclamation

projects in the South China Sea, rejection of maritime-dispute arbitration, establishment of air defence identification zones in contested spaces, and confrontations along the Sino-Indian border. Through this combination of carrots and sticks, China is shaping the region's political, economic and security architecture to accommodate its preferences.[10]

Thus, the real threat India faces is not an outright invasion or a catastrophic Sino-Indian war. The danger, rather, is that over years of superior and compounding economic and military growth, China could amass an overwhelming preponderance of power and establish a hierarchical, Sino-centric system in the Asia-Pacific region. In such a world, India would remain formally independent, but in practice be unable to resist Chinese coercive pressure should Indian and Chinese interests clash.[11]

India is responding to this danger with a combination of external and internal balancing activities. Externally, India has sought closer cooperation with likeminded countries such as Japan and Vietnam to coordinate regional military capabilities and responses that could offset rising Chinese power. Most importantly, India is partnering with the US, which has invested in building Indian capacity through arms sales ranging from howitzers to maritime patrol aircraft, technology-sharing initiatives that include aircraft carrier components and jet-engine development, joint operational training such as the trilateral Malabar naval exercises, and ever-deepening diplomatic engagement. The US has classified India as a 'major defence partner', and Indian leaders have referred to the US-India relationship as "indispensable."[12]

India also is investing heavily in conventional military capabilities. It is increasing the capacity of its army with a mountain strike corps to protect its roughly 4,000-km of northern borders[13]; expanding its navy by acquiring new submarines, surface ships, and naval aviation capabilities; and improving its air force by updating its ageing fleet of combat aircraft.[14] Through the 'Make in India' programme, India hopes to ensure that many of these weapon systems, even if acquired from foreign defence firms, are domestically manufactured with Indian partners. If successful, this initiative can help create jobs in India, mitigate interoperability problems, and bolster India's domestic defence industry.[15]

Even if India's efforts to augment its conventional capabilities are highly successful, India will be unable to match Chinese military growth. Therefore, a crucial element of India's efforts to balance internally against China is the improvement of its nuclear weapons capability. India has long viewed its nuclear programme as an essential means of insulating itself from Chinese military superiority. Indeed, India originally justified its 1998 nuclear tests with reference to the Chinese threat. More recently, after testing its intermediate-range Agni V ballistic missile, Indian officials publicly noted the ability of Indian nuclear forces to reach all parts of China. As one Indian defence analyst put it, "Agni-V will be the last link in the chain of land-based deterrence vis-a-vis China… This will certainly place the country at par with

the Chinese."[16] Similarly, India seeks to expand its submarine force and develop a sea-based deterrent primarily to counter Chinese growth in these areas and to create a secure second-strike capability.[17] Nuclear weapons cannot solve all of India's China-related strategic problems. They will not, for example, enable India to prevent China from challenging contested borders, engaging in economic coercion, or undertake territorial reclamations. But they do provide a layer of protection that will prevent China from threatening Indian survival or sovereignty. Such protection will be essential given the growing Sino-Indian strategic asymmetry with which India must contend.[18]

How do India's efforts to expand its nuclear capability to insulate itself against growing Chinese power comport with Indian nuclear doctrine? Indian nuclear doctrine has gone through two iterations: a draft nuclear doctrine in 1999 and an updated doctrinal statement in 2003. The 1999 draft stated that India would seek to achieve what it called "credible minimum deterrence" with its nuclear forces. To this end, India would adopt a posture of no nuclear first use (NFU), and would employ nuclear weapons only to deter nuclear attack through the threat of retaliation in kind. As the doctrine put it, "India will not be the first to initiate a nuclear strike, but will respond with punitive retaliation should deterrence fail."[19]

India followed its 1999 draft nuclear doctrine with an official doctrinal statement in 2003. India's 2003 statement tempered its 1999 no-first-use commitment, stating that in the event of a major chemical or biological weapons attack, India could use nuclear weapons first.[20] This modification seems to have been in part a reaction to the doctrines of the P5 nuclear powers, which contain similar language. It raised questions, however, about India's nuclear thresholds and how strict India's NFU doctrine actually was.[21] Further, where the 1999 statement said that India could use nuclear weapons in response to "any nuclear attack on India and its forces," the 2003 statement threatened an Indian nuclear response to "a nuclear attack on Indian territory or on Indian forces anywhere." This modification seems to have been directed against Pakistan, which has explicitly suggested it might use nuclear weapons to thwart an Indian conventional attack, either before or after Indian forces crossed into Pakistani territory.[22] Thus, on one level, the 2003 official update appears to be an important departure from India's unambiguous 1999 commitment to no first use, suggesting that India's threshold for nuclear use had become considerably lower than it had been previously.

Despite this hedging on no first use, however, the 2003 and 1999 statements had much in common. Like the 1999 draft, the 2003 statement envisioned nuclear weapons as political instruments to be employed only for generating deterrence and not for war fighting. Consequently, neither doctrine contained any war fighting options and both pledged, as a general principle, not to use nuclear weapons in response to conventional attacks. Both documents made clear that if India does use nuclear weapons, it will do so only in the form of punitive retaliation, designed to inflict unacceptable costs on the adversary.

The 2003 document also continued to characterise India's nuclear posture as one of "credible minimum deterrence." Credible minimum deterrence is an ambiguous term. It is impossible to know for certain whether India's adversaries view India's nuclear threats as credible, or the minimum size of the nuclear arsenal needed to ensure that they do so. Since credible minimum deterrence has no objective definition, how it is operationalised depends on Indian leaders' prevailing beliefs about what constitutes a sufficient nuclear arsenal. Still, credible minimum deterrence, if it is to mean anything, must connote and promote minimalism—the least capability necessary to protect India from aggression. And, at one level, India has hewn to a minimalist course. Its arsenal consists of a relatively modest 90-110 weapons, despite the larger sizes of both China's and Pakistan's arsenals. India has thus far forgone delivery systems that would be more suitable for nuclear war fighting. Instead, India has pursued secure second-strike capabilities that would allow it to ride out a nuclear attack and conduct punitive retaliation in accordance with its doctrine.[23]

Despite this modesty, India has sought improvements in the size and quality of its nuclear arsenal. For example, India continues to produce weapons-grade fissile material, and probably could expand its arsenal to 135-180 warheads. India is also augmenting its delivery capabilities with the development of the supersonic *Brahmos* cruise missile and the flight-testing of the intermediate-range Agni V ballistic missile, which would allow India to reach targets across the entirety of China. The follow-on Agni VI, which is still under development, reportedly will possess multiple independently targeted reentry vehicles (MIRVs), helping it to defeat missile defence systems and potentially giving India a counterforce capability.[24] In addition, with the recent induction of the nuclear-powered ballistic missile submarine INS *Arihant*, and the testing of the K-4 sea-launched ballistic missile, India has taken significant steps towards fielding a sea-based deterrent.[25]

It is not entirely clear how the goal of "minimum credible deterrence" squares with these new developments. Indeed, some of these efforts appear to represent a significant departure from India's stated principle of nuclear minimalism. They also create genuine dangers. For example, increasing fissile material production heightens the probability of radiological accident, while building more warheads and delivery systems introduces greater risks of unauthorised nuclear use. And whether India considers it justified or not, such expansion can put pressure on India's adversaries to respond by expanding their own nuclear arsenals, thus creating further accidental or unauthorised use dangers. More accurate and reliable missile delivery systems and MIRVs can create arms-racing incentives and potentially first-use pressures, particularly if an adversary fears that India might use such capabilities to launch a disarming first strike. Although sea-based deterrents are generally believed to be stabilising, they can create significant dangers, including first-use incentives, command-and-control difficulties, and arms racing on both the nuclear and conventional fronts.[26]

Given the urgency of the Chinese strategic

challenge, however, Indian security managers have sought to improve the country's nuclear capabilities, despite the associated costs, risks, and doctrinal tensions, and they are likely to continue doing so in the future. What further nuclear changes and improvements might India seek to insulate itself against rising Chinese power? To enhance its second-strike capabilities with survivable, long-range systems while maintaining its no-first-use doctrine, a reasonable option could be to fast-track its naval programme, particularly the expansion of its SSBN fleet. To protect its SSBNs, India would also need to invest in the acquisition of a larger, more capable fleet of nuclear or diesel-powered attack submarines. These platforms would serve a dual purpose, protecting Indian missile submarines while also helping India to contest Chinese domination of the maritime domain, which is where much of the Sino-Indian security competition is likely to occur. Such an expansion of India's submarine capabilities will be costly, and will also require Indian security managers to consider seriously the nuances and challenges of putting nuclear weapons at sea. Particularly important will be developing and exercising operational concepts; prioritising and improving the survivability of the nuclear-armed platforms; and building robust, redundant command-and-control processes.[27] Despite these challenges, however, a larger fleet of SSBNs could conceivably enable India to enhance deterrence while maintaining its NFU posture and reducing investment in the other legs of its triad.

Another option would be the development of shorter-range, battlefield nuclear capabilities to protect India against a Chinese conventional attack. Such systems could give India a means of defending the contested Sino-Indian border even against a powerful conventional force. Since they would be relatively economical, their use could allow India to devote more resources to the maritime domain. Moving towards smaller, battlefield systems would introduce a host of challenges associated with physical security and delegation of launch authority for the weapons during a crisis, however.[28] Most importantly, deploying smaller, short-range systems to defend against conventional attack would indicate a willingness to use nuclear weapons first, despite India's NFU pledge.

Could India decide to revisit its no first use posture? There are good strategic reasons for it to at least consider doing so. On a theoretical level, NFU can make sense for a strong state that is able to defeat its opponent wholly at the conventional level, and therefore does not need nuclear weapons to deter conventional attack. NFU is less useful however to a state that may need the threat of nuclear retaliation to deter conventional aggression by its stronger adversary.[29] This is the position in which India finds itself relative to China. If India seeks to enhance its ability to derive conventional deterrence from its nuclear weapons, India may need to consider modifying its no-first-use policy. This would not necessarily mean that India should jettison NFU wholesale. India could instead adopt a language that would add a measure of ambiguity to its stated posture, thereby undermining an adversary's confidence that it could launch a conventional attack against India without triggering nuclear escalation. Indeed, debates within the Indian strategic

community have already raised the possibility of rethinking no first use.[30] And although Indian officials have not expressly stated an intention to do so, some senior leaders have hinted that reconsideration could be possible.[31] The pressures to revisit the policy are likely to become even stronger as Chinese capabilities grow in the coming years.

If India decided to reconsider its nuclear doctrine, it could do so in the context of a comprehensive nuclear posture review similar to that of the US, in which the relevant stakeholders—civilian security managers, the military, and the scientific research community—start from first principles, air their views, and discuss changes that have occurred in the region since the last nuclear doctrine was promulgated. Whether to hold fast to no first use, to jettison the concept entirely, or simply to add further caveats to the circumstances in which India would consider nuclear use legitimate, is of course for India to decide. The exercise of deciding in an organised and relatively transparent manner however would likely be valuable, creating a firmer intellectual foundation upon which choices about India's nuclear force posture could be made.[32]

Regardless of what India decides to do, and how India decides to do it, the answer to the editors' original question is clear: nuclear weapons have an important role to play in Sino-Indian security relations. They provide India the final measure of protection against a rising adversary that is engaged in increasingly competitive regional behaviour, and with which India has a fraught history. Determining the most productive way to manage its nuclear capability and enhance this protection will be one of India's foremost strategic challenges in the coming years.

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