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## **Shifting Domains of Warfare**

General MM Naravane

**CENTRE FOR LAND WARFARE STUDIES**

**Field Marshal Sam Hormusji Framji Jamshedji Manekshaw, MC**, better known as Sam “Bahadur”, was the 8th Chief of the Army Staff (COAS). It was under his command that the Indian forces achieved a spectacular victory in the Indo-Pakistan War of 1971. Starting from 1932, when he joined the first batch at the Indian Military Academy (IMA), his distinguished military career spanned over four decades and five wars, including World War II. He was the first of only two Field Marshals in the Indian Army. Sam Manekshaw’s contributions to the Indian Army are legendary. He was a soldier’s soldier and a General’s General. He was outspoken and stood by his convictions. He was immensely popular within the Services and among civilians of all ages. Boyish charm, wit and humour were other notable qualities of independent India’s best known soldier. Apart from hardcore military affairs, the Field Marshal took immense interest in strategic studies and national security issues. Owing to this unique blend of qualities, a grateful nation honoured him with the Padma Bhushan and Padma Vibhushan in 1968 and 1972 respectively.



*Field Marshal SHFJ Manekshaw, MC  
1914-2008*

CLAWS Occasional Papers are dedicated to the memory of Field Marshal Sam Manekshaw  
**Photographs courtesy:** The Manekshaw family/FORCE.

## SHIFTING DOMAINS OF WARFARE

General MM Naravane  
PVSM, AVSM, SM, VSM, ADC  
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New Delhi



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The Centre for Land Warfare Studies (CLAWS), New Delhi, is an independent Think Tank dealing with national security and conceptual aspects of land warfare, including conventional & sub-conventional conflicts and terrorism. CLAWS conducts research that is futuristic in outlook and policy-oriented in approach.

**CLAWS Vision:** To establish CLAWS as a leading Think Tank in policy formulation on Land Warfare, National Security and Strategic Issues.

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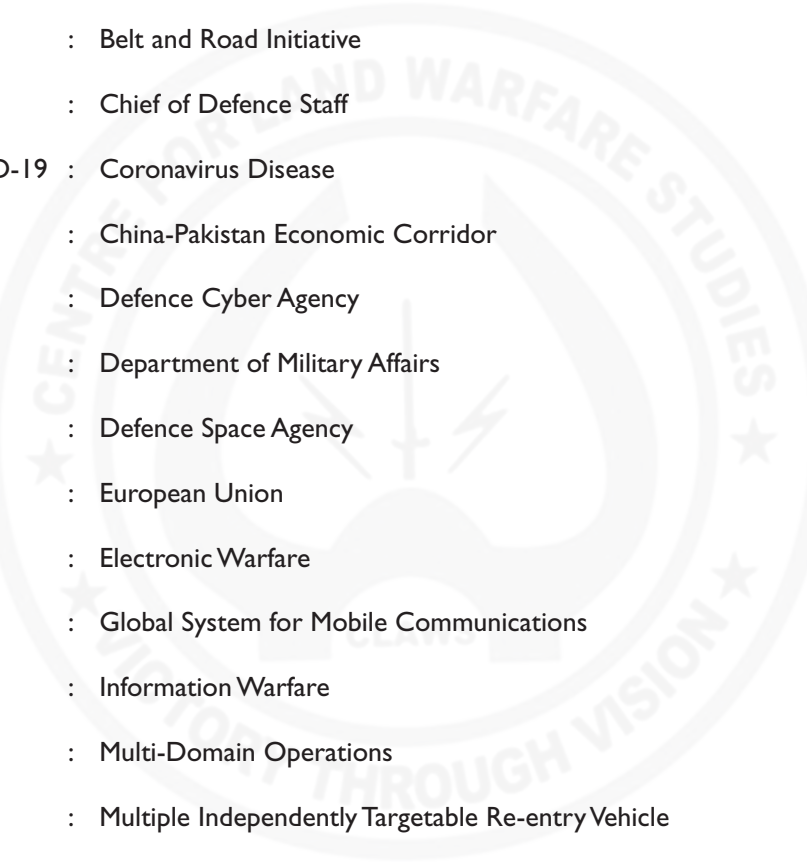
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# List of Abbreviations



ADIZ	: Air Defence Identification Zone
AI	: Artificial Intelligence
ASEAN	: Association of Southeast Asian Nations
BRI	: Belt and Road Initiative
CDS	: Chief of Defence Staff
COVID-19	: Coronavirus Disease
CPEC	: China-Pakistan Economic Corridor
DCA	: Defence Cyber Agency
DMA	: Department of Military Affairs
DSA	: Defence Space Agency
EU	: European Union
EW	: Electronic Warfare
GSM	: Global System for Mobile Communications
IW	: Information Warfare
MDO	: Multi-Domain Operations
MIRV	: Multiple Independently Targetable Re-entry Vehicle
PNT	: Precision, Navigation, Timing
QUAD	: Quadrilateral
UAV	: Unmanned Aerial Vehicle
US	: United States



# Foreword

There has been rapid changes in the geopolitical, economic, and strategic landscape over the last two decades. It has been more relevant to the Asian region, primarily because the 'power and economic' centre of gravity has been progressively shifting from the trans-Atlantic to Asia. Considering the changing character of future warfare, and the operational dynamics, General MM Naravane, PVSM, AVSM, SM, VSM, ADC, Chief of the Army Staff (COAS), and Patron CLAWS delivered two insightful talks at CLAWS. On the occasion of the CLAWS Founders' Day on 18 November 2020, he spoke on the *Shifting Domains of Warfare: Special Focus on China's Increasing Adventurism*. The next talk was during the Annual Army Seminar-cum-Webinar, Divya-Drishti 2021 on 11 February 2021, where he discussed at length about *Multi-Domain Operations: Future of Warfare*. The COAS suggested the need to understand and prepare for the complex and ambiguous character of emerging warfare, with a preponderance of hybrid tools in a grey zone environment. He reiterated that, besides the traditional domains of land, sea, and air, the other vital components of Multi-Domain Operations (MDO) include the domains of cyber, space, electromagnetic, biological, as well as information and psychological warfare.

Innovation, agility, and ingenuity are essential to keep pace with the exponential technological transformation that is taking place in today's world. Also, there is a need to analyse the new potential applications of the emerging technologies. Space and stealth based technologies are being used extensively for multiple military tasks. The COAS also highlighted the economic insecurity that the world has been experiencing since the onset of the COVID-19 pandemic. According to him, today's world is moving towards a 'plurilateral' one where coalitions of the 'willing' and 'middle powers' have gained much importance and this is also the necessity of the hour.

Over the last two decades, with sustained economic growth, rapid strides in technology and innovation, the ongoing transformation of its military force, robust defence industrial base, global manufacturing hub, and multi-pronged extension of its flagship Belt and Road Initiative (BRI), China has emerged as an acknowledged global power. China has been actively involved in shaping the geopolitics of the region: from the South China Sea to the Indian Ocean Region and South Asia, as also from Iran to Central Asia. Concurrently, besides cementing special relations with its 'all weather friend' Pakistan, China continues to improve its relations with India's immediate neighbourhood,

namely, Nepal, Myanmar, Bhutan, Bangladesh, and Sri Lanka, to limit India's influence in the Region.

The changes in the character of warfare were all too evident during the decade-old conflicts in the Middle East and North Africa (MENA), Ukraine (2014), Armenia-Azerbaijan (2020) and the most recent one between Israel and Hamas (2021). Apart from the competitions in geopolitical, strategic, and economic spheres, the role of regional, extra-regional powers, non-military means to achieve politico-strategic-military objectives, information warfare, and technology-enabled systems, have been central to the outcome of conflicts.

South Asia is one of the most unstable and volatile regions of the world. According to a Report published by the Institute of Economics and Peace (IEP), Sydney, in 2021, South Asia has been ranked as the second least peaceful region of the world. The historical baggage of boundary-cum-territorial disputes between India and Pakistan, as well as India and China, which remain unresolved till date, and other conflicts in the Region, have given rise to "trust deficit" among the nation states.

According to the United Kingdom based Centre for Economics and Business Research (CEBR) report, released on 27 December 2020, China is expected to be the largest economy by 2028, and that India is expected to be the third-largest economy by 2030. One cannot ignore the report of Stockholm International Peace Research Institute (SIPRI) which states that China's military expenditure is estimated to have totalled to US \$ 252 billion in 2020, a rise of 1.9 per cent from the previous year; thereby making it the second highest in the world as far as military expenditure is concerned. This rise has been despite the raging ongoing pandemic (COVID-19), and the resultant economic downturn. What is significant is the fact that China's defence budget is second only to the United States. It just goes to show that in its quest to pursue its "China Dream", it is committed to modernising its armed forces, according to its laid down long-term goals which is to achieve modernisation by 2035, and make them world-class by 2049. In the future, China also aims to be the leader in other domains such as cyber, information, and space. Concurrently, China is pursuing its new concept of Military-Civil Fusion (MCF), which fuses its economic and social development strategies with its security strategies, to support China's "great rejuvenation goals".

Given our threats and challenges, both external and internal in that order, and the growing nexus between China and Pakistan, India should remain prepared for conflict on a two-front scenario, and operations on multiple domains. The changing global-cum-regional dynamics have necessitated the need to modernise one's military and prepare for Multi-Domain Operations

(MDO). Everyone agrees that there is an operational necessity to focus on jointness and integration within and among the three services. To achieve these, it calls for a change in the mindset at all levels, more importantly, the senior leadership. India needs to take note of the critical disruptive technologies and areas of applications in two main fields—first, direct military applications like robotics, direct energy weapons, electronic warfare, hypersonics, UAVs, precision bombs, and MARVs; second, other applications like Artificial Intelligence, augmented reality, facial recognition, 5G, Internet of Things (IoT), digital currencies, biotechnology, supply chain management, and transportation systems. Therefore, the emphasis on *Atamnirbhar Bharat* and indigenisation, to produce ‘quality defence equipment’, is an excellent step to achieve self-reliance. Concurrently, it is expedient for the Indian Armed Forces to make conscious efforts to understand the nuances of niche and disruptive technologies.

The speeches of the COAS have been perceptive and thought-provoking. He has covered a wide canvas of the strategic environment, threats, and challenges to India in particular, and the measures to be taken to prepare ourselves. Given the contemporary situation, CLAWS has decided to publish both the speeches as a Manekshaw Paper. The Paper would be of great interest to the policymakers, practitioners, and students of strategic studies, and would help them to analyse the emerging new strategic environment and take measures to effectively deal with the future challenges.

June 2021

**Lt Gen (Dr.) VK Ahluwalia**  
*Director CLAWS*



GENERAL MM NARAVANE  
PVSM, AVSM, SM, VSM, ADC  
Chief of the Army Staff (COAS)

## **SHIFTING DOMAINS OF WARFARE**

### **COAS' Keynote Address on CLAWS Founder' Day (18 November 2020)**

#### **Opening Remarks**

Good Morning everyone!!

On the occasion of 15 Years of Excellence of the Centre for Land Warfare Studies (CLAWS), I extend my felicitations and best wishes to the Director CLAWS, Research Fellows, Associates, and Staff for reaching this important milestone. My compliments to you for being an embodiment of excellence in the field of Land Warfare, National Security, and Strategic Issues. I compliment CLAWS for organising the seminar-cum-webinar on *Shifting Domains of Warfare with Special Focus on China's Increasing Adventurism*. As patron of this think tank, it is a matter of great pride for me to deliver the Keynote Address, on this contemporary topic especially in the current context of Chinese aggression in Eastern Ladakh. With so many luminaries, military experts, and respected members of academia delving over this, I am confident that this seminar-cum-webinar will throw some interesting takeaways. I am certainly looking forward to it.

#### **Defining the Twenty-First Century Geopolitical Construct**

Before I begin my talk, I shall briefly cover the geostrategic construct in the twenty-first century. Since the beginning of the second decade of the twenty-first century, the world has been witnessing a watershed, defined by a rapidly changing global security environment. With the envelope of geopolitical and geostrategic challenges continuously expanding, in form and magnitude, it has become more difficult to tackle the same than in the past.

#### **Global Security**

The global security environment has been besieged by economic insecurity due to COVID-19, and military insecurity due to China's belligerence, particularly in the South and East China Seas and along the Himalayan Borders. Today, we are witnessing a more nationalist, inward-looking America, a hegemonic China ready to challenge the United States (US), a Europe divided by Brexit, a re-emerging Russia, a normalising Japan, an insecure Association of Southeast Asian Nations (ASEAN), and an even more disturbed West Asia. Economic rebalancing now has a political manifestation. COVID-19 and the global Chinese aggression have precipitated a politico-economic meltdown in US-China relations. China, on the other hand, sees

this as an opportunity to assert itself the world over. Recent events in Eastern Ladakh have the potential to alter the world's outlook. ASEAN, QUAD, European Union (EU), and many nations have openly expressed their desire for 'open seas' and 'rule based international order'. The world, it seems, is pushing back now.

### ***Unipolar-Unilateral World***

The unipolar-unilateral world that was transforming to multilateral is slowly creeping towards being plurilateral where coalitions of the 'willing' and 'middle powers' are bound to find greater space. Spheres like connectivity projects, technology choices, medical research, data protection, security, and Intellectual Property Rights (IPRs) adherence, have strategic connotations. Radicalism and trans-national terrorism continue to remain a major threat that India will have to confront in the future.

### ***Hybrid Warfare***

The practice of hybrid warfare, both by state and non-state actors is an omnipresent reality. Dispute over resources, gaining control over spheres of influence and strategic regions, issues of climate change, food security, economic downturns, the rise of religious fundamentalism, and increasing signs of 'neo-colonial' behaviour that violates the very principle of 'sovereignty' are some of its new-age reasons. All these manifestations have broadened the context of national security.

### ***China's Involvement***

Chinese involvement continues to increase in India's immediate neighbourhood vis. Nepal, Myanmar, Bhutan, Bangladesh, and Sri Lanka. China's increasing involvement in Afghan affairs, prior to the US withdrawal, is a significant development. Border belligerence, 5G technology, issue of Dalai Lama's re-incarnation, trade deficit, non-tariff barriers faced by Indian companies in China, and China's alliance with Pakistan continues to haunt India-China relations. Pakistan's efforts to internationalise the Kashmir issue, its influence over the Taliban, and the impending US withdrawal from Afghanistan are again a disconcerting reality. India's challenges, therefore, are no more limited to just political confrontation—the differences in the economic, diplomatic, and other spheres have now been added to the 'hybridised warfare' of today. Undeniably, a key aspect that defines the twenty-first century is the growing rivalry between great powers—one that has gained impetus by the 'not so peaceful' rise of China and another, the emergence of regional powers like India. This consequently shifted global attention from West-centric to Asia-centric and transformed the twenty-first century to an "Asian Century".

## Shifting Domains of Warfare

Rapid changes in the geopolitical and the geostrategic environment have transformed the understanding of warfare. Though the nature of war remains constant, the character of war and forms of warfare are constantly evolving. The calculus of 'ends, ways, and means' are endlessly adapting to evolving constructs. Battlegrounds are becoming far more complex, highly contested, and increasingly lethal, with battlespaces expanding from the traditional land and maritime domains to the emerging domains of cyber, electromagnetic, and space making it a "multi-domain" battlespace.

The evolution in warfare, which many military experts have predicted, is driven by a 'military-technical revolution' bringing unprecedented firepower, depth, and transparency to the battlefield. The most significant developments for land warfare have been identified as simultaneity and non-linearity, lethality and dispersion, volume and precision of fire, advanced technology, mass & effects, as well as invisibility and detectability. These developments are driving adjustments in tactics, organisation, doctrine, equipment, force matrix, and methods of command & control. The character of war is also being influenced by new concepts and technologies available to the protagonists. Global hotspots are throwing up new trends and changes in the contours of future warfare. New age warfare may take the form of grey zone warfare, non-contact warfare, cyber warfare, information warfare to name a few; uses all and every means available, including irregular forces and social media to its advantage. There is a 'blending and blurring' between traditional state and non-state actors.

Technology today is increasingly impacting both that is battle-thought and battlespaces in profound ways. At present, the three domains, namely, land, sea, and air have merged with space and cyber domains, which are fast emerging as additional points of impact and fusion. Combat is no longer confined to just the physical domain—it has become a feature of informational and cognitive domains. These domains have added new dimensions to waging war, thus making it real-time, spreading its reach as well as having the ability to distantly control it. While the race for supremacy between the world powers in the space and cyber domain is increasing in pace, paradoxically, the more sophisticated the fighting force, the higher the likelihood of it suffering from crippling cyber attacks. Space based assets, pivotal to strategic security and playing a critical role in the conduct of future land operations, are also under threat. Multifaceted information operations have already become essential operational and strategic imperatives, for land forces in securing critical battlespaces.

The latest revolution to influence land warfare is in the field of Artificial Intelligence (AI), autonomous weapons, and robotics. Some experts argue that the greatest revolution in military affairs, since the atom bomb, is the advent of “robotic warfare”. There are many more disruptive “niche” technologies like Quantum Technology, 5G, Nano-Technology, Hypersonic Technology, Stealth, etc., that have the propensity of altering future wars. These must be studied, researched, and applied to the ‘art and science’ of warfighting. Not just these, but simple ‘low-end’ technologies like drones, used innovatively as swarms or in ‘lone-wolf’ actions, can cause substantial damage. What is of concern is their easy ‘over-the-shelf’ availability and ease of use. In the hands of terror organisations, these present a serious challenge to security forces, the world over.

The practitioners of warfare must also understand the changed perception of ‘victory’ and ‘defeat’. The Clausewitzian description of victory as a condition where the enemy’s ability to enter battle, resist or resume hostilities is destroyed, has changed. A military victory today ‘does not’ guarantee a political one. This blurred understanding of ‘victory’ has many faces and more often, is challenging to assess. There is a constant quest to realise the changing battlespace and overcome the technological and logistic challenges to deter conflict. Thus, the shifting domains of warfare are forcing us to evolve a ‘multi-domain battle concept’ that will make the Indian Army future ready.

## Understanding China

China, today, is in the best position in its modern history. It has done remarkably well economically and has developed itself politically into a strong, powerful, and influential nation. Today, the world faces a confident China that is aspiring to regain its lost ‘Middle Kingdom’ status, under its ‘goal-centric’ China Dream. Having taken a departure from Deng Xiaoping’s dictum of “keeping a low profile”, China now aims to shape rather than integrate itself into the regional and international order and create a new world order with ‘Chinese characteristics’. The traditionalistic government of today’s China, which follows ‘Socialism with Chinese characteristics’, is difficult to fully understand. Rather than pushing for stronger bilateral and multilateral relations with its neighbours, it has developed some serious differences with Japan over the Senkaku Islands, with Taiwan, the Philippines, and Vietnam over the South China Sea and recently, and very dangerously, with India in Eastern Ladakh.

On one side, China advocates its peaceful rise and benign economic ambitions while on the other, it displays belligerence all across. China needs

to understand that “the one thing that war would do, is to undo, in one moment, China’s economic rise”. If peace disappears, so will prosperity.

China, through its ‘Belt and Road Initiative’, is trying to achieve both continental and maritime supremacy that challenges the status quo of the West dominated global order. Simultaneously, it also aims at making the People’s Liberation Army (PLA) a ‘World Class Military’ by 2049. This aspiration of transforming the PLA into a ‘combat ready expeditionary force’ is considered essential by it—something that interests the other nations. Their intentions are exemplified by their increasing military budget that is second only to the US and its aggressive drive towards achieving ‘military-civil fusion’ which is now a ‘national strategy’.

China’s growing adventurism is more visible now than ever before. According to China, this is to secure its geopolitical and economic interests to realise their dream of “Great Rejuvenation of the Chinese Nation”. This is evident from China’s increasing expansionist designs and military adventurism in every quarter. Apart from challenging the world order and impacting regional dynamics, it has started exploiting its expertise in the fields of Information Warfare (IW), cyber, space, and disruptive technologies, to pressure and pursue its adversaries. Thus, China is increasingly becoming volatile in its quest for supremacy.

## **Chinese Adventurism against India**

Apart from the military adventurism by the Chinese to alter the status quo unilaterally in Eastern Ladakh, including ‘salami slicing’ tactics of land grab, the Chinese have offensively and unobtrusively used other means to pressurize India. Chinese attempts to orchestrate cyber attacks on the Indian cyber assets, are a sovereign concern that must not be lost sight of. Between June 15 to 20, 2020, approximately 40,000 attempts to attack Indian cyberspace have been recorded and most of these attacks originated from Sichuan alone. Snooping attempts on Defence Establishments using disinformation, fake news and, to top it all, a fake Aarogya Setu application, are some other misadventures that China continues to engage in. The seriousness of the issue can be gauged from the very fact that as we speak, India, despite all the Information Technology (IT) process that it commands, has only 556 cyber experts as against 1.25 lakh experts in China and 91,080 in the US. Furthermore, China makes no distinction between hackers who work for the government and those who undertake cyber adventures on its behalf—be it cyber militia or individuals in their personal capacity.

Chinese collusion with Pakistan in the cyber domain cannot be discounted and may very well be already happening. Critical infrastructures and public

narratives, if held hostage to such manipulations, do not bode well for the overall security of the world and India in particular. The cyber attack on Kudankulam Nuclear Unit in October 2019, despite not being connected to the open cyber network/internet, should serve as a stark reminder to all that, cyber attacks are not fiction any more. Imagine what would happen if one day a CO of a unit receives complaints from his troops that their pay has been credited and debited almost instantaneously or if families and relatives receive spoofed messages on their smartphones about the possible dangers to their son/spouse with his/her photograph.

Herein, lies the close linkage between Cyber and Information Warfare. Similarly, the linkage between cyber, EW, and IW are also equally robust and significant. Our tendency to carry mobile phones is no more a simple concern. Today, Electronic Warfare (EW) systems possessed by advanced militaries, which also includes the PLA, are capable of picking Global System for Mobile Communications (GSM) signals. Imagine a unit/formation in its Staging Area with just 50 per cent of soldiers carrying their mobile phones. The e-signature picked up by enemy EW systems will instantly connect through the automated sensor-shooter links, and bring accurate artillery fire even before the battle is joined.

Development of a very capable and modern arsenal of dual-capable missiles (conventional and nuclear) by China, includes Hypersonic and Multiple Independently Targetable Re-entry Vehicle (MIRV) capabilities. They have all the capabilities and plans while intentions can develop anytime. We, as a nation and as part of a comity of nations that espouses a 'rules based international order', must demand greater transparency on the Chinese missile programme, lest it leads to flawed assessments. The asymmetric advantage that such missiles provide needs to be looked into with concern and urgency. China's advancements in AI, 5G, Robotics, Drones, and Swarming Technology, by virtue of their robust military-civil fusion, have immense military applications and are bound to change the rules of the game significantly. One thing that emerges very clearly is that, if given a choice, China would want to defeat its adversaries using all these technologies and only engage in 'traditional Kinetic Operations' as a last resort.

In saying so, do not misunderstand me, in meaning that traditional forms of military power have lost their significance. The kind of terrain that exists along India's Northern Borders, necessitates the primacy of traditional military power. This is more than evident in the context of the current standoff in Eastern Ladakh. It was our ability to dominate tactically important areas with 'boots-on-ground' that tilted the balance in our favour. Moreover, in an 'eye-ball to eye-ball situation', all these so-called

force-multipliers and high technology came to the naught. It will always, therefore, be in India's interest to get close to the enemy so that there is no discernible front.

Nevertheless, when all these newly acquired capabilities act as an adjunct to traditional military components, the effects are manifold. While India understands well the Chinese tendency to exaggerate issues for propaganda and information advantage, our troops and tactical commanders cannot be insulated from the fallouts of such planned orchestrations. Strategic communications, statements, and directives from China's topmost hierarchy and a tactical playback with the planned release of video footages on global media, highlighting swift mobilisation of PLA to Aksai Chin by rail and air, deployment of an array of high altitude advanced weapons including Z-10 attack helicopters, and Karate fighters being deployed along the Line of Actual Control (LAC), is nothing but plain and simple subterfuge which the Chinese are experts in.

Today's China is least concerned about its 'good neighbourhood policy' and is more focused on securing its interests. The most notable example of this is the China-Pakistani Economic Corridor under BRI that infringes on India's sovereignty and territorial integrity; the misadventure in Doklam threatening Bhutan's sovereignty, the establishment of an Air Defence Identification Zone (ADIZ) over the Senkaku Islands in the East China Sea contrary to Japanese claims, and the recently reported border row with Nepal—considered a friend till now.

## **Responding to an Aggressive China**

There remains no doubt that the transformation of the PLA holds implications of China's ambitions wherein, the Himalayan Border with India becomes one of its key battlespaces. India, therefore, needs to be fully prepared to counter China's designs.

India must concentrate and focus on strengthening core capabilities and simultaneously keep working upon building capacities in emerging and disruptive technologies, which have the potential to change/shift the domains of warfare to an altogether different level. Given the prevailing situation, India must remember that we are dealing with an aggressive, assertive, and uncompromising China. Undoubtedly, the fight now is in new realms and one needs to adapt to the modern, high-tech battlefield calling for greater agility, precision, and being combat-ready at all times. The complex battleground needs urgent preparation to cater for the fast-evolving multi-dimensional battlespace.

## Concluding Remarks

While it is our endeavour to maintain peace, there should remain no doubt that India is not ready to compromise or give any form of concession when it comes to securing its sovereignty and territorial integrity especially along the Himalayan border with China. China's disposition will not deter India, which continues to 'stand tall and strong' in fighting every ingress that the PLA makes and is making along the LAC. Last but not the least, the desire lies in actions by all elements of national power to serve the country's interests. Only by following this equation, can one fight and win the 'shifting domains of warfare'.

As Patron CLAWS, it gives me immense pride to see CLAWS striding on its path to success. I am confident that CLAWS will live up to the trust reposed on it and meet the aspirations of promoting strategic thinking in India.

My sincere compliments for your efforts to achieve excellence and resolve towards nation-building.

**Jai Hind!**

**Inaugural Address**  
**by**  
**The Chief of Army Staff at Divya-Drishti 2021**  
**(Annual Army Seminar-cum-Webinar 2021)**  
**(11 February 2021)**

Former Chiefs, Director CLAWS, Lieutenant General VK Ahluwalia, Distinguished Speakers and Participants, Officers from the Three Services, The Rapidly Growing CLAWS Fraternity, Esteemed Veterans, Members of the Media, Ladies and Gentlemen.

### **Preliminaries**

I recall vividly, my speaking to you at the CLAWS International Seminar on 04 March 2020 to be precise, and discussing the various nuances of the rapidly changing character of war. Although, the Pandemic had spread across many areas by then, we had still not fathomed its true impact. A year has passed and here I am addressing you in the virtual mode. The disruptive powers of the Pandemic have been adequately demonstrated and acknowledged.

At the outset, I extend a warm welcome to our distinguished speakers. Thank you for joining us in these challenging times. We look forward to your views and perspectives on today's subject of great contemporary interest. I also wish to thank Director CLAWS, Lieutenant General VK Ahluwalia, for allowing me to deliver the inaugural address.

Today's talk, in many ways, can be seen as a natural progression over the theme in 2020. Large platforms which were once the mainstay of the twentieth century battlefield—the Main Battle Tanks, Fighter Aircrafts, and large surface combatants—have been rendered relatively less significant in the face of emerging battlefield challenges in newer domains.

Much of what we discussed in 2020 has panned out in various conflicts across the world in the year gone by. We have seen how the very imaginative and offensive use of drones in Idlib and then in Armenia-Azerbaijan, challenged the traditional *prima donnas*—the tanks, the artillery, and the dug-in infantry. We have also seen how disruptive technologies are now driving doctrinal cycles like never before. It may not be inaccurate, therefore, to infer, that 'technology itself is steadily emerging as a core combat capability'.

Many issues related to future capabilities that we deliberated on, are being put into effect in the Indian Army as we speak. It goes on to establish the

natural connection between fora such as this, and the operational dynamics and capacity building in the field. In keeping with these developments, 'the Indian Army is steadily consolidating its structures and capabilities towards winning Wars of the Future'.

It gives me great pleasure, therefore, to commence the deliberations this morning, on a subject of equal import—one that is occupying the mindspace in strategic and military circles across the globe—Multi-Domain Operations (MDOs).

### **Multi-Domain Operations: Purport**

Today's Seminar is a good opportunity for us to explore the true salience of the term and clear some of the cobwebs around the concept. More importantly, we need to figure out the specific contours of its applicability in the Indian context. I shall flag a few issues for you to take forward in your discussions.

So, what are the drivers behind the concept of MDOs? Well, for years our adversaries have studied the attributes, especially the weaknesses of western-style militaries in warfighting, and have developed stratagems to exploit the same. We have been schooled in many of those precepts. So, even as we focus on fine-tuning our operational preparedness in hardcore kinetics, they focus their energies in the ambiguous grey zone, seeking to out-manoeuvre us in the competitive spaces short of an all-out conflict. As we fixed our gaze on building core capacities in land, sea, and air they took the battle to the newer domains of space, cyber, and informatics. With western militaries focusing on amassing massive combat power through the aggregation of large military platforms, viz. tanks, guns, and aircraft carrier led huge naval armadas, our adversaries invested in creating a formidable standoff enterprise in the form of long-range precision fires, Precision, Navigation, Timing (PNT) systems, hypersonic vehicles, and robust air defence capacities.

To put it more simply, visualise a game of football being played between two teams. On one side they are playing Soccer, an orderly game, strictly by following the book. The rules are pretty stringent and any physical contact raises the red flag. The other team though is preparing for a different kind of football—American-style Rugby—the players are clad in their protective gear. The game, unlike the earlier one, is intensely physical, complex, and it's often difficult to make out who has the advantage in the ongoing tussle. Even the shape of the ball is different. The latter in many ways, symbolises the complex and ambiguous character of emerging warfare. In such a contest there is little doubt as to who will win. The first team needs to change and change fast.

## Multi-Domain Operations: Concept

The concept of MDO, therefore, is a structured attempt to find answers to these new levers of competition and combat. It is still an evolving concept. The concept is best exemplified by four key postulates. These are as follows:

1. The fact that combat is no longer confined to the traditional domains, but is expanding steadily to the newer domains of cyber, space, the Electromagnetic Spectrum, and the digital space. To win Future Wars, mere mastery of the traditional domains of land, sea, and air will no longer suffice.
2. The need to address threats posed by new actors both, in the kinetic and non-kinetic spaces, to grapple with in MDOs.
3. As the adversary expands the contest to the grey zone, there is a dire need for modern militaries to be as proficient in competition as in hardcore kinetics. We may like to reflect on the fact that nations are in constant competition even though they may not necessarily be at conflict. The need to develop proficiencies and skills to prevail in the 'strategic competition' is of utmost importance. We need to shed the classical war and peace disposition and enhance cross-governmental fusion to win aggressively in the competitive space. We will need to build and create 'cross-functional teams' that thrive in ambiguity and chaos.
4. There is a need to address the growing challenges posed by the adversaries in standoff deterrence. It is required to develop capacities to strengthen our anti-access prowess as also develop proficiencies to overcome the anti-access capacities of the adversary, both, to strengthen our defensive framework, as also to add punch to our offensive posture.

Therefore, as an operational concept, MDO influences both 'Force Structuring and Capability Development'. It impacts our future training and preparation for war. MDO necessitates integration and convergence of capabilities across all domains to gain control over the operational environment. The establishment of the Defence Cyber Agency and the Defence Space Agency underscores our intent to leverage these new domains of warfare.

## Associated Tenets and Challenges

With these postulates as the backdrop, let me now try and drive home the salience of a few associated tenets.

A few years from now, in a typical MDO engagement, a Combat Group assault on enemy dispositions, will be enabled by multiple capacities

across domains. So, a High Space UAV System or investments in Low Orbit Technologies will provide the Combat Group Commander with complete transparency of the enemy battlespace through real-time, persistent surveillance. This could be complemented by a Su-30 reconnaissance mission, hours earlier, with the imagery of key enemy dispositions offloaded into a 'tri-service cloud' for instant retrieval. A Cyber Strike, as part of the Preparatory Bombardment will disable enemy radars, command & control apparatus, and EW systems. Having achieved complete mastery over the battlespace in terms of visual transparency as also the domination of the electromagnetic spectrum, the kinetics is unleashed. As the traditional fire and manoeuvre elements of the combat group launches physical assaults, a swarm of offensive drones, based on autonomous, AI enabled edge computing and distributed intelligence projects, 25 kilometre in-depth, are released to neutralise enemy mechanised columns that are moving in for a counter-attack. Through such 'smart convergence' and the 'innovative bundling of technologies' across multiple domains, a futuristic MDO enabled Indian Army Combat Group will achieve its mission with surgical precision in compressed timeframes and at fractional costs.

Ladies and Gentlemen, some of you would recall the swarm drone offensive striking multiple targets showcased during the Army Day Parade in January 2021. Such swarms can overwhelm and effectively suppress the enemy's Air Defence Capability, creating windows of opportunities for our strike elements. It is also no longer necessary to score a physical hit to destroy a target. Offensive capabilities in the digital domain can effectively neutralise satellites and networks, denying them at a critical juncture to decisively alter the course of the conflict. The swarm drone demonstration was a message to our adversaries that

*"The Indian Army is steadily inducting niche capabilities to enhance our combat proficiencies in Multi-Domain Operations".*

Concurrently, we are also working towards penetrating the Anti-Access Bubble of our adversaries by investing in long-range vectors as also through the smart leveraging of our aircraft and aerial platforms.

The concept of MDO is founded on integration and convergence. The Chief of Defence Staff (CDS) and Department of Military Affairs (DMA) framework is indeed a huge step forward. However, we still have a long way to go in the domain of jointness and integration. MDO Task Forces will have to be interoperable. We would need to transit rapidly to full-scale integration for digital era combat as also in the pursuit of greater interoperability. We need to recognise the scale and magnitude of the challenge and move with

greater rapidity towards integration in combat, cross-governmental fusion, and complete dissolution of inter-agency as also civil and military silos.

Information manoeuvre is another essential attribute of MDO that we need to embrace. It entails, absolute synchrony between information, cyber, and intelligence capabilities of the three services with wider government networks.

Ongoing developments and situation along India's Northern and Western Borders leads us to ponder over yet another reality i.e. the nature of our unsettled borders and consequent challenges with regards to the preservation of territorial integrity and sovereignty. Without a doubt, there are newer threats on the horizon, but the hard reality is that the legacy of challenges has not quite gone away, instead have only grown in scale and intensity. While the Indian Army will continue to prepare and adapt to the future, the more proximate, real, and present dangers, on our active borders cannot be ignored. The requirement of 'boots-on-the-ground' cannot be wished away.

The principal challenge, therefore, before us today, is that of the growing capability enhancements in an era of finite budgets. There are no easy answers. Our structures, inventories, and human resources will need to adapt and transform accordingly. The ability to initiate change and sustain transformation will be the first step in our successful embrace of multi-domain capacities. The future lies in becoming agile, smart, fleet-footed, and innovative in thought and action alike.

No military, however, can hope to transform and truly modernise if it is dependent on foreign technology and weapon systems. The *Atmanirbhar Bharat* call of our Hon'ble Prime Minister envisions creating such indigenous capabilities, as are required for preparing the Indian Armed Forces for the future battlefield. The Capability Development roadmap of the Indian Army is aligned to the vision of *Atmanirbharta*. Combined with concurrent 'Force Structuring' and 'Force Rebalancing' initiatives, the Army is evolving into a modern and highly skilled force, fully capable of safeguarding our national interests.

May I end on a note of caution! For MDO to truly take root, we will need to significantly grow our understanding and cultivation of 'convergence and disruptions in technologies'. Else, MDO capacities in true sense may prove elusive. It may be useful to recall that similar concepts were envisioned in the past, like Net Centric Warfare and Full Spectrum Dominance, which failed to grow to their full potential, because the associated technological possibilities did not keep pace. We do need to take note of such pitfalls and act with greater resolve if MDO is to become a reality in the Indian context.

I do hope that my talk has stimulated your intellectual curiosities and creative instincts in equal measure. I look forward to the Report on today's deliberations for study and implementation by the Indian Army, in the days and months ahead.

**Jai Hind!**





**General MM Naravane**, PVSM, AVSM, SM, VSM, ADC did his schooling at Jnana Prabodhini Prashala, Pune. An alumnus of the National Defence Academy and the Indian Military Academy, he was commissioned in The Sikh Light Infantry Regiment in June 1980. He is an alumni of the Defence Services Staff College, Wellington, and Higher Command Course, Mhow. The General Officer holds a Master's Degree in Defence Studies, an M.Phil Degree in Defence and Management Studies, and is currently pursuing his Doctorate.

In a distinguished military career spanning almost four decades, he has the distinction of serving in key command and staff appointments in Peace and Field, both in the North - East and Jammu and Kashmir, and has been part of the Indian Peace Keeping Force in Sri Lanka. He brings with him an enormous amount of experience in serving in the most challenging areas. He has commanded a Rashtriya Rifles Battalion, raised an Infantry Brigade, was Inspector General Assam Rifles (North) and has commanded a prestigious Strike Corps. His staff assignments include tenures as a Brigade Major of an Infantry Brigade, Defence Attache at Yangon, Myanmar, an instructional appointment in the Army War College as Directing Staff in the Higher Command Wing, besides two tenures at the Integrated Headquarters of the Ministry of Defence (Army), New Delhi.

He had the privilege of commanding the Republic Day Parade in 2017 in his capacity as GOC Delhi Area. After successfully commanding the Army Training Command, Shimla and the Eastern Command in Kolkata, he held the appointment of Vice Chief of the Army Staff before assuming the appointment of the Chief of the Army Staff on 31 December 2019.

### About the Paper

There has been rapid changes in the geopolitical, economic, and strategic landscape over the last two decades. In this Manekshaw Paper, the COAS suggested the need to understand and prepare for the complex and ambiguous character of emerging warfare, with a preponderance of hybrid tools in a grey zone environment. He reiterated that, besides the traditional domains of land, sea, and air, the other vital components of Multi-Domain Operations (MDO) include the domains of cyber, space, electromagnetic, biological, as well as information and psychological warfare. The speeches of the Chief of Army Staff (COAS) have been perceptive and thought-provoking and would be of great interest to the policymakers, practitioners, and students of strategic studies, and would help them to analyse the emerging new strategic environment and take measures to effectively deal with the future challenges.

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