

PREPAREDNESS RISKS MITIGATION - PRIORITIES FOR THE LAND FORCES

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“It would be fallacious to assume that a single service will dominate future warfare. Joint integrated operations across multiple domains is the way ahead.”

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Abstract

The nature of warfare is rapidly changing primarily due to rapid advances in communication, Internet of Things (IOT), automation, robotics, Artificial Intelligence and Quantum Computing technologies. The preparedness of the Land Forces will also be dictated by the nature of threat facing the country. The key drivers of this threat are and will be China, Pak, terrorist threats emanating from across the borders on either front. Due to this the nation is likely to be in a constant state of war in the grey zone. Therefore, the wars will no longer be the preserve of the military let alone a single service and the Land Vector will be one amongst the many entities that will be involved in conflict resolution or response.

Land forces must adapt to function in an integrated manner in a multi domain environment. Non - contact warfare with primacy of fire power and disruptive technologies will dictate the way land forces will have to structure, prepare and fight. Human Resources will need to be oriented to fight in tech heavy environment but at the same time taking

care to exploit the advantages offered by the Himalayan terrain and Weather conditions against China and use of disruptive technologies such as swarm drones, long-range vectors and high mobility forces in HAA/SHAA terrain in consort with Air Forces. The focus of land forces must be prioritised towards threat number 1 that is the northern borders. A 2-2 or 3-1 orientation of Strike Elements is highly recommended.

China is expanding its influence in the IOR to strangle India, accordingly the Naval Forces in synergy with Air Force and Land Forces need to restructure their response. Land Forces can contribute immensely in this endeavour by raising a small marine force. This force could be the last nautical mile entity to secure a maritime operations to defend our unheld Island territories and expeditionary operations in times of humanitarian assistance, evacuation of our diaspora and securing national interest.

There is a need to work towards creation of tri service entities such as cyber command, Special Forces command, Information Operations Agency We may consider upgrading the ADG PI to a tri — service organisation. The land forces need to assist the raising of tri-service theatre commands and tri - service functional commands in the best possible manner without destabilising itself in the transitory phase.

Internal Security does lead to diversion of effort from the primary task of the military especially the land forces. It is highly recommended that the Land Forces commitment from such tasks should be minimised and restricted to disturbances along the Borders such as LC, LAC and Myanmar. It would be even more advisable to place the Central Armed Police Forces such as the ITBP and SSB under command the Army along these borders for better response and avoid Pangang Tso from reoccurring. Other Desired Capabilities for the Land Forces in the current and foreseeable future pertain to greater synergy in intelligence gathering, upgradation of the Special Forces to deal with grey zone threats, electronic warfare, air defence, logistics, command and control, manoeuvre, defence diplomacy and strategic mobility. Land Forces need to master niche technology and exploit unmanned systems to deliver

maximum TNT on the enemy target coupled with deft moves in the grey zone to emerge victorious in future wars across the entire spectrum.

Introduction

Given the ever evolving nature of warfare brought about by the magnitude of technological developments in the military affairs, mounting cost of waging conventional war in terms of lives and physical destruction, wars have become option of last resort . Also due to existential consequences of a nuclear conflict, nuclear wars are unlikely to take place. Quite simply put, the Clausewitz's theory of war comprising the famous trinity "People - Army - Government" is gradually losing its shine to the subsequent thinking of Clausewitz in his famous work "On War" where he started laying "more and more emphasis on people's war and co-operation between the regular army and militia or partisan forces, or citizen soldiers, as one possible——sometimes the only——method of defence."¹ The countries are gradually shifting to this form of warfare which is now commonly referred to as the Hybrid, Proxy or Grey Zone Warfare. However, this does not imply that the importance of conventional military is diminishing. It continues to remain relevant even today and will remain so in foreseeable future. Military power acts as an underwriter for deterring a conventional war against an adversary should the non-military means to secure strategic advantage in a geopolitical contest spiral out of control. The implications are that wars will become more and more complex and challenging with coexistence of non-military and military content in the ratio of 4:1 as prophesied by General Gerasimov, the Chief of General Staff of the Russian Armed Forces.² It implies that the wars will no longer be the preserve of the military let alone a single service. The Land Vector will be one amongst the many entities that will

1 Handel, Michael I. (1986). Clausewitz and Modern Strategy. Psychology Press. p. 71.

2 Russian version by General Valery Gerasimov, "The Value of Science Is in the Foresight" Voyenno-Promyshlenny Kurier online, 26 February 2013, <http://vpk-news.ru/articles/14632> For English version see For English version see, Sivitski Arseni, "The Belarus-Russia conflict through the lens of the Gerasimov Doctrine," Belarus Digest, 06 March 2017, <https://belarusdigest.com/story/the-belarus-russia-conflict-through-the-lens-of-the-gerasimov-doctrine/> (accessed on 18 April 2021)

be involved in conflict resolution or response. If this be so how should the land forces prepare themselves? Answer to this question and related aspects will be the focus of this paper.

Aim

To suggest measures for enhancing the defence preparedness of the land forces to operate in an integrated manner with other vectors of war fighting across the entire spectrum, emerge victorious and mitigate the risks of waging such conflicts.

Current and Future Conventional Security Threats to India

Collusion between China and Pakistan stems from the Pakistani desire to settle scores with India and the Chinese interest to settle boundary dispute on its own terms coupled with mutual interest in the China Pakistan Economic Corridor (CPEC). While China being the stronger power will not like to be seen as overtly seeking collusion, Pakistan jumping into the milieu opportunistically in the event of a Sino - Indian conflict is a distinct possibility. Sino - Pak nexus may include enhanced military deployment along the borders, economic coercion, increased maritime activity in the Indian Ocean Region (IOR) and in the worst case threaten military action to stretch the security effort of India.

China is the primary security threat to India. The ongoing confrontation between India and China has dashed the hope of revival of cooperation that got kindled following the informal Wuhan³ and the Mamallapuram summit meetings⁴ between Modi and Xi Jinping. The long term intention of China remains subjugation of India by targeting its national will. In the process it is likely to address our strategic vulnerabilities including

3 Shruti Godbole. "Wuhan Summit: An important signal of intent by India and China," May 23, 2018, Brookings, <https://www.brookings.edu/blog/up-front/2018/05/23/wuhan-summit-an-important-signal-of-intent-by-india-and-china/>. May 11, 2021.

4 V. Nivedita. "Modi-Xi informal summit: Key takeaways." October 15, 2019, the HindustanBusinessline.Com, <https://www.thehindubusinessline.com/news/modi-xi-informal-summit-key-takeaways/article29680297.ece> . May 11, 2021.

our nuclear assets and missiles, undertake offensive along our northern frontiers for which it has earmarked between 40 to 45 Combined Arms Brigades (CAB) including three to four PLA, Airborne CABs.⁵ It has cut down its land forces, increased the mechanised content, and made them firepower heavy. It is modernising the Navy at a frantic pace. At the structural level it has transformed its military into Theatre Commands with five theatre commands covering the entire country.⁶ India faces the Western Theatre Command. China already has two carrier task forces and is soon going to add the third one in its arsenal.⁷ However, the Chinese are unlikely to start a major conflict in the short to medium term till they are not assured of a sure win. Reasons are: a) slowing down of the economy because of COVID; b) tardy progress of CPEC and BRI upon which hinges the mega dream of Xi Jinping to become the economic powerhouse of the world; and c) the loss of face due to the resolute and determined response of India during the Doklam and Galwan crises. China will continue to play around in the grey zone with transgressions along the Northern Borders, undertake cyber-attacks and conduct information wars in the short term.

Pakistan's economic health, threat of being black listed by the FATF and the worsening internal situation discourages it from waging a conventional war with India but it will continue to wage proxy war in J&K. However, if pushed to the wall or if it gets an opportunity in the event of a collusive opportunity, conventional operations cannot be ruled out. Pakistan will maintain a dissuasive conventional capability along the land frontiers with ability to exploit an opportunity in the event of a collusive war and deploy submarines in the IOR.

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- 5 Authors assessment based on experience and the total force level available with PLA in the open source domain.
 - 6 Kenneth W. Allen, Dennis J. Blasko, John F. Corbett, Jr. "Updated - The PLA's New Organisational Structure: What is Known, Unknown and Speculation, Parts 1 & 2." Jamestown.org. https://jamestown.org/wp-content/uploads/2016/02/Updated_The_PLA_s_New_Organizational_Structure_-_What_is_Known__Unknown_and_Speculation_Parts_1_and_2.pdf . May 12, 2021. P.5-7.
 - 7 "Comparison of China and India Military Strength 2021." Global Firepower. Com, <https://www.globalfirepower.com/countries-comparison-detail.php?country1=china&country2=india>. May 11, 2021.
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Grey Zone Threats / Unconventional Threats

Internal threat in the country is manifesting in the form of religious extremism cum ethnonationalism in J&K. The military threat in the state manifests in the form of infiltration across the Line of Control (LC), attacks against the Security Forces, attacks against innocent civilians and host of grey zone threats. Similarly in the NE, although the militancy is going down, but peace eludes us. The now famous draft Naga Accord remains in a limbo. LWE is even bigger threat to the country. Attack on the CRPF in Bijapur and Dantewada are few examples. In fact the LWE Militant Group is fifth most virulent terror group in the world way ahead of the LeT, JeM, AQ, etc. See Table 1.⁸ Further, “Since 1999, to 15 November 2014, 12,353 persons have been killed in Left Wing Extremist violence in India.”⁹

Cyber Attacks by China have become a common occurrence. Report of the US based Insikt Group clearly establishes this assessment . “It observed a large increase in suspected targeted intrusion activity against Indian organisations from Chinese state-sponsored groups. From mid-2020 onwards, ten distinct Indian power sector organisations, including 4 of the 5 Regional Load Despatch Centres (RLDC) responsible for operation of the power grid through balancing electricity supply and demand, have been identified as targets... Other targets identified included two Indian seaports.”

Table 1: Top Five Perpetrators of Terrorism

Perpetrator Group	Total Attacks		Total Deaths*		Total Injured*		Kidnapped / Hostages	
	2019	2018	2019	2018	2019	2018	2019	2018
Taliban	1034	987	5094	6214	4984	4064	550	1285

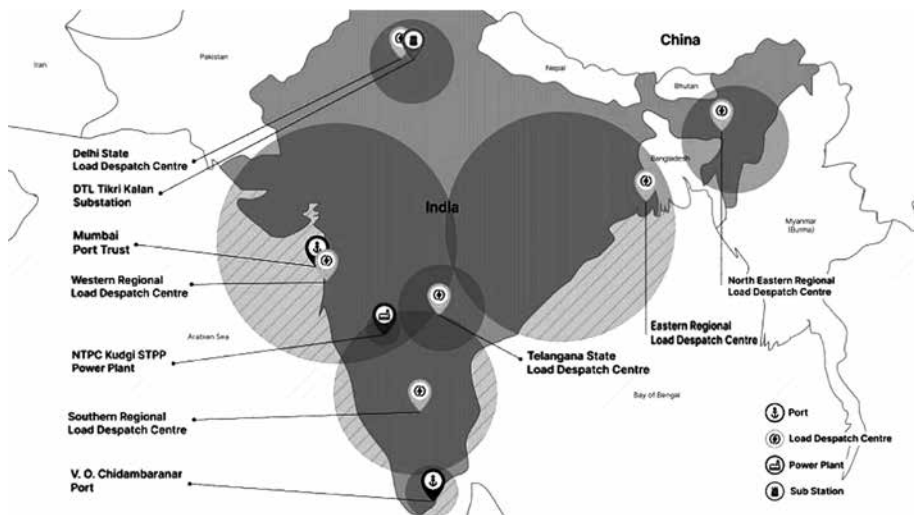
8 Global Terrorism Data Base, July 2020, https://www.start.umd.edu/pubs/START_GTD_GlobalTerrorismOverview2019_July2020.pdf (accessed on 25 April 2020)

9 Ajai Sahini. *Bullet Holes in Village Walls*. October, 2015. Routledge Handbooks Online. https://www.routledgehandbooks.com/doi/10.4324/9781315674742.ch18#sec18_2 . Abstract. May 12, 2019.

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Houthi extremists (Ansar Allah)	446	277	436	258	609	260	394	410
Islamic State of Iraq and the Levant (ISIL)**	343	560	954	1601	1319	1423	41	970
Boko Haram	245	171	1069	732	378	589	304	376
Maoists/ Communist Party of India - Maoist (CPI - Maoist)	226	247	136	175	87	154	94	135

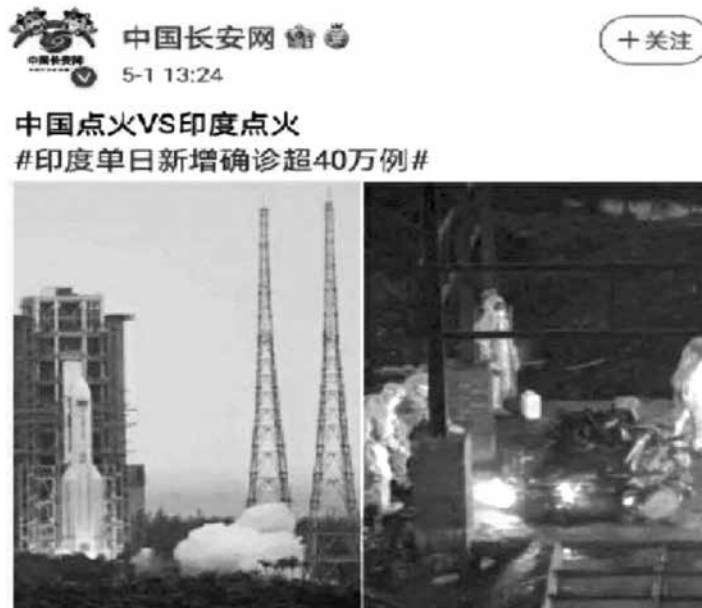
Figure 1



Given such a capability, PLA would be able to paralyse our defence systems, airports and other important military bases.

Information Warfare is also becoming a preferred tool of statecraft. India is constantly targeted by our adversaries. Global Times, a Chinese Communist Party paper has been working overtime to spread rumours and fake news following the Dokalam and the Galwan incidents. The recent tweet in Chinese media by CCP showing the picture of launch of a Chinese Rocket alongside burning funeral pyres

Figure 2



of COVID cases is a blatant example of information war. See figure 2. Pakistan too has left no stone unturned to internationalise the Kashmir issuebeit in the UN or other International Bodies. Likewise, the International Terror groups such as the Willayat - e - Hind (ISIS India Branch) and AQIS have been indulging in information operations against the country taking advantage of the recent unrests following the NRC and CAA agitations. Such actions also have an adverse impact on the morale and motivation of our troops.

RECOMMENDATIONS FOR BETTER DEFENCE PREPAREDNESS AND RISK MITIGATION

Land Forces Capability to Enable Smooth Transition to Integrated Theatre Commands

Recently the Army Chief gave a statement that it will be fallacious to think that any single service would be able to deal with the future military challenges. He hinted at integrated war fighting as one of the important

factors in winning the current and future wars.¹⁰ Have we integrated our armed forces, afraid not? While some entities and structures have been raised such as the office of the CDS but is that enough? Where are the Geographical commands? Where are the much needed resource for A&N Command 21 years after its foundation? Future demands military transition into Theatre Commands and Joint Functional commands. To achieve this the Land Forces need to reorient and reorganise themselves to enable smooth transition to integrated structures and war fighting. Salient issues are discussed below.

High-tech Capability of Land Forces (LF) needs a Quantum Jump. China has heavily invested in Artificial Intelligence(AI) and robotics. On the other hand Indian research on AI and other niche technologies such as unmanned systems is in a nascent stage. The private equity investments in Indian AI companies in 2019 were between 900 million to \$1.2 billion. This investment is way less than the US and China (\$25 billion and \$5 billion respectively in 2019), but the good news is that India nearly tripled its AI investment in 2019.¹¹ Capability in the areas of AI, robotics, cyber security and employment of armed drones, UAVs, navigation and guidance systems, sensor shooter links are recommended to be taken up on top priority and personally driven by the Chief.

Space Based Defence Capability of the Armed Forces especially the Army needs to be enhanced. While, the IAF has outlined its space vision in detail, the Land Warfare doctrine just has a brief mention about it. There are 14 satellites that are being used for military purposes. Navy and AF have a dedicated satellite GSAT 7 and GSAT 7A. Although the Indian Army is also likely to get a dedicated satellite it needs to improve the exploitation of space based resources.¹² Accordingly

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- 10 Barnwal J. Ed. "COAS Interview with SP". SP's Land Forces December 2020-January 2021. Volume 17 No. 6. <https://spslandforces.com/ebook/75062020.pdf> . Accessed on May 19, 2021.
 - 11 Raibagi K. "AI Ecosystem: Where Does India Stand Compared To The US & China." April 19, 2021. <https://analyticsindiamag.com/ai-ecosystem-where-does-india-stand-compared-to-the-us-china/> . May 14, 2021.
 - 12 Sanjay B. Maharaj. "India's Military Satellite Options." www. geopolitics.in. January 2020. <https://reader.magzter.com/reader/ig8h88vi6veydpppwm6zr39842816575909/398428#page/18> May 15, 2021.

following is recommended: (a) Operationalisation of Indian Regional Navigation Satellite System (IRNSS) to overcome our vulnerability of being dependent on a foreign navigation system NAVSTAR/GPS. (b) Fast track the completion of our Defence Communication Network to ensure net centric warfare. (c) Early Warning Capability to detect missile attacks. For this there may be a need to have dedicated military satellites. (d) Dedicated military satellites are also needed for SIGINT and COMINT. (e) we need to reduce revisit time, secure data transmission, quick processing of the military images upto the field formation level.¹³

Cyber capability too needs an urgent attention. Our ability to defend against cyber attacks is questionable. There is a need to raise a Cyber Command with strong components from each service which should control and conduct military defensive as well as offensive cyber operations. Till the tri service Defence Cyber Agency matures and transforms into a Command Land Forces must develop an effective defensive as well as offensive cyber capability.

Information Dominance cannot be over emphasised. Such operations have to be properly integrated with the national strategic level guidelines. ADGPI is currently doing a fine job but it is no match to the IW agencies of our adversaries. ADGPI must rapidly enhance its capabilities and take the shape of a tri service entity with expanded role. Land Forces could take the lead in this capability development.

Expeditionary Capability continues to remain restricted to HADR. However there is a need to be prepared to undertake low level military operations of the Maldives type to safe guard our national interests especially in our neighbourhood. An important component of this capability is the need for marine component. This must be conceptualised with a brigade strength force under the Indian Navy for future envisaged role in the Indian Ocean Region (IOR), as regional net security contributor. The force should be capable of multi-mode insertion and adaptability to wide

13 Ramesh Krishnan. Mission ASAT: Why India needs a satellite killer. Business Today, March 28, 2019. <https://www.businesstoday.in/opinion/perspective/mission-asat-why-india-needs-a-satellite-killer/story/331884.html> . May 15, 2021.

spectrums of conflict. It must have organic point AD capability. Finally, it must be have to capability to operate with other two services including international defence forces.

Joint Training is an area that is extremely important from the perspective of fighting in an integrated battlefield environment which entails functioning under joint structures. Therefore, ARTRAC must inject greater joint content in various courses and training programmes. HC and DSSC need a relook for greater jointness. The NDC (National Defence College) must start laying more stress on strategic games. It may also be a good idea to have a mega joint APPA - NDC Strategic War-game conducted by either the USI or VIF or the ORF to empower future leaders from various domains to respond to security situations with a whole of a nation approach.

Land Forces Specific Capabilities

Infantry is the edifice of land forces. The new normal of warfare created due to tsunami in technological development demands that all the components of land forces especially infantry is capable of surviving modern wars yet remain mobile and lethal. This necessitates transformational doctrinal changes and reorganisation. Suggested doctrinal framework should comprise firstly, an offensive outlook/capability to successfully prosecute conventional and unconventional operations across all spectrums of conflict and frontiers. Secondly, improve survivability, lethality and mobility for undertaking operations at the tactical and operational levels. Thirdly, force preservation and force projection are vital battle winning factors in informationalised environment for enhanced lethality, precision and range. Accordingly, the desired capability for the infantry should be first, a future ready soldier. The soldier with his weapon and equipment will remain the core element and at the centre of land warfare be it conventional, unconventional or Military Operations Other Than War (MOOTW). Second, the IBG concept suitably customised to operate in Mountains and Plains will need to be gone into. This will facilitate the current and future demands of multi domain warfare. Third, force Preservation/ Protection and Enhanced Standoff Lethality will be of prime importance for effect based operations

under informationalised conditions. Threat and terrain based tailor-made anti-tank and Air Defence capabilities at stand-off ranges would be required. Force preservation by way of protection, both during static and mobile operations, require inclusion in the structural construct. Fourth, and possibly the most crucial is the C⁴I²SR and Battlefield Transparency under intense EW environment and systems to facilitate 'Mission Oriented' command structure. And finally, mobility, deployability and sustainability will be the driving factors for reorganisation. The infantry modernisation must focus on Task and theatre specific organisation in combined arms and multi-domain environment. Also every soldier must transform into a Sensor (S3) and shooter as well. Keeping all these in mind the structural concept of Infantry warrants threat and terrain based reorganisation into Mechanisation, Motorisation and Standard Infantry, Airborne, to transform Infantry. Further, there is also a need for Tailor-made Specialised Forces such as Scouts, special light infantry battalions.

Mechanised Forces will be driven by technology in future wars. Hence, commanders at all levels should be able to imbibe technological tools into their war fighting strategy and operational and tactical plans. Despite technological advantages, ground still remains the most important factor both on the Northern as well as the Western front. Mechanised forces also have to survive in technologically advanced future war environment otherwise the degradation of the mechanised forces will make the task of the adversary easier for launching his offensive plans — both along the northern and the Western front. Hence, it is imperative that counter RPA systems are inducted which gave area protection as well as protection to individual tanks oblique ICV. Induction of light tanks in northern borders and high-altitude is also imperative since the lesser weight offers multiple benefits like the power to weight ratio which allows scaling high passes and mountain heights, less weight also facilitates air transportability and inter sector move. With technological advancements Light Tank would be comparable in firepower with medium tank and as also with active protection systems and soft skill measures will enhance its efficacy. The counter RPA systems can be integrated into the light tank and made more ISR enabled with ability to control UAVs.

Air Defence have become All Weather (AW) and multi-platform centric with focus shifting towards Remotely Piloted Systems (RPS). Future AD threat can be visualised as accurate delivery of a large number of guided munitions either through manned or unmanned platforms to inundate a space segment in short time frame to achieve Favourable Air Situation (FAS). Hence it will need a variety of weapons to engage the threat. No single system can counter the RPF threat completely. However guns combined with multiple detector including acoustic electro-optic / IR, micro Doppler radar, RF and visual sensors can affordably be used to detect track and engage RPS. High energy lasers are another viable options. Capability development should address firstly, establishment of an integrated early warning in conjunction with assets of all services and civilian resources. Second, the focus to remain on countering 5th generation aircrafts and SSL with modern technologies. Third, there is a need to create capability inherent to weapon systems to pick up and engage small size target such as RPS, UCAVs so as to reduce shooter to sensor time. Fourth, minimum three layer of AD cover to be planned for critical assets with a mix of weapon system. Fifth, closed in stage weapons or terminal AD system to be capable of protecting the assets from Rockets, arty, and motors also for example the Iron Dome System. Sixth, auto target designation to the most suitable weapon system should be built in to the C&R system. Further, placing Air Defence under the command of land formations and units has always been debated given the challenge to manage the airspace where AF is the major player. However, AD cover in the TBA is also of utmost importance. Accordingly it is felt that AD components in terms of Smart Guns and Smart Missiles must continue to remain with proposed IBGs and Pivot as well as Strike Corps be it for the HAA, Mountainous, plains or desert sectors. The systems should be portable and present a small signature especially for the Super HAA and HAA. It should be capable of operating through EW environment. As regards coordination, the concept should be decentralised and distributed responsibility and centralised system of sharing information of air picture through a foolproof interoperable communication network and C&R Structure.

Aviation Support is the future of warfare, no doubt that Air Force is the primary service to manage air support but it has been experienced that given the commitments of the AF more often than not the TBA gets ignored. To fill the gap and to avoid the delay in shooter — sensor link an effective aviation arm is a must for reconnaissance, surveillance, close fire support and logistics requirements. The procurement of Apaches will help speed up the mechanised formations especially in the plains and the desert sector. Its utility in SHAA, HAA and mountainous regions is limited due to ceiling limits and bulk. For the mountains the LCH (Light Combat Helicopters) units are ideal and should be increased in numbers along our Northern Borders. As far as UAVs, UCAVs, drones and RPAs are concerned ideal would be that unmanned UAVs be placed under the Arty. However, given the way these birds were being handled and crashes taking place these assets would be best utilised if placed under the Aviation. As regards making the Shooter and Sensor loop faster the General Staff has to configure effective communication and command and control network to make them effective. In any case the control always rests with the General Staff. There may be a need to create a Manned, Unmanned Teams to effectively utilise the RPA/UAVs/UCAVs/. Effective communication and C& R is key to its success. As regards future capability development is concerned the need will be to focus on lethality and accuracy of firepower systems, night capability including operating in bad weather conditions and finally the survivability both physical and digital.

Long Range Fires capability also lacks adequate punch. As has been proved in the Kargil war and in the recent Armenian - Azerbaijan conflict that unless long range fires are delivered along with air power on the enemy defences including targets in the Tactical Battle Area, victory will be hard to come by. As part of the modernisation drive in the FY 2020-21, Six Pinaka Regiments are under procurement. However, is that enough to succeed on the future battle field? Many defence experts feel and rightly so that given India's long frontier with China, Pakistan and the need to defend Island territories we require a far greater number of Pinaka Regiments. As per earlier estimates of few years back when

the Chinese threat was much less than today, 22 Pinaka Regiments were considered essential for defence of the country. Now when the threat has increased and become more serious we have reduced the requirement to only 10.¹⁴ This defies logic. We need to exploit this weapon for defence along our northern borders especially in the light of the fact that the Chinese have deployed 280 Km AR 3, the PHL - 03 MRL with 12 launch tubes for 300 mm rockets (range 130 - 160 km) or the standard A-100 rocket launchers similar to the Russian Smerch.¹⁵ Hence, it is recommended that the Pinaka regiments must be enhanced to a minimum of 26 from the currently planned 10 Regiments. In addition, other long range heavy weapon systems should also be inducted in a prioritised manner.

Signal Support needs to be rephrased as Digital Electromagnetic Spectrum Support. As part of risk mitigation measures some of the suggested measures are firstly, there is a need to have proper Technological component in the newly created IBGs in the form of Electromagnetic Support Organisation. Secondly, there is a need to spread technological awareness amongst the combat arms especially the infantry. It is a known fact that technology in today's world is all pervasive yet while appreciating an operational and tactical situation. As we discuss ground, relative strength and time and space it is now mandatory to include Technology as the fourth Sub Head of appreciation before finalising an operational plan. Thirdly, formats of appreciation, operational instructions and directives must have a comprehensive examination of technological factors. Fourthly while we do have components dealing with providing communication, communication denial measures are still very weak or non — existent. Fifthly, net centricity needs improvement on a war footing. Our sharing of information, intelligence and operational inputs is very tardy and slow especially lateral between two IBGs and Divisions. Sixthly, while we still have a well-developed communication infrastructure to share external intelligence amongst various entities of

14 Lt. Gen. P. Ravi Shankar. "Match Chinese MRLs with Pink." India Today Insight. April 22, 2021. <https://www.indiatoday.com/emag> . May 14, 2021

15 *ibid.*

the Armed Forces it is still archaic as far as sharing of internal intelligence between SMACs and MACs are concerned. Technologically we need to focus on five year upgrades of our electronic systems as obsolescence rate in electronic domain is very high. In the long term we need to build communication, communication denial systems using the 5G, Big Data, and Artificial Intelligence technology. As far as possible these should be developed indigenously given the sensitive nature of such system.

Engineering Support in the given operating environment needs to focus on enhancing mobility of own forces, countering the mobility of enemy and enhancing the survivability of our combat elements. As part of mobility enhancement we need to look for mechanically launched bridges, mechanic launched aerial cable ways of 1 to 3 km, high capacity dozers and JCBs and innovative use of existing equipment such as PMP/PMS bridges to make shunts around land extension into lakes and rivers. For example we can make shunts around the finger areas (Finger 3 to 4) in Pangang Tso Lake. Similarly as part of countering enemy mobility, we could look at vehicle based mine scattering system in mountainous terrain on an urgent basis. Similarly, we need to go in for man packed mine scattering systems and innovative use of combined teams comprising of mechanised elements, infantry anti-tank weapons/ missile detachments, and engineer assault teams (for constructing operational tracks) to fight the battle of delay lines and channelising the enemy into to killing zones. For survivability, we need to go in for tunnelled storage, CDLs for storage of water and supplies and IR lights for Helipad markings etc. From a futuristic perspective, we need to go in for, rapid erectable shelters, heavy duty excavators-track and wheeled, AI based mine detection and destruction systems, water purification equipment and high head water pumps.

Military Infrastructure along the Northern Borders still remains short of the requirement. As per open source report besides the ongoing projects which include the construction of 3,323 km roads along the boundary with China, the Ministry of Defence is working on additional 104 roads (around 6,700 km) along the Line of Actual Control (LAC) in Ladakh,

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Himachal Pradesh, Sikkim, Uttarakhand and Arunachal Pradesh.¹⁶ This momentum must continue if India wants to secure itself against a Chinese misadventure.

Airborne Forces of the Indian Armed Forces have fundamental airborne infrastructure and airlift capability in the form of Independent Para Brigade and strategic air-lift squadrons of the Indian Air Force, which at the moment are sufficient and can be augmented in future, if required. However, we need to work towards providing them with all terrain mobility and protection.

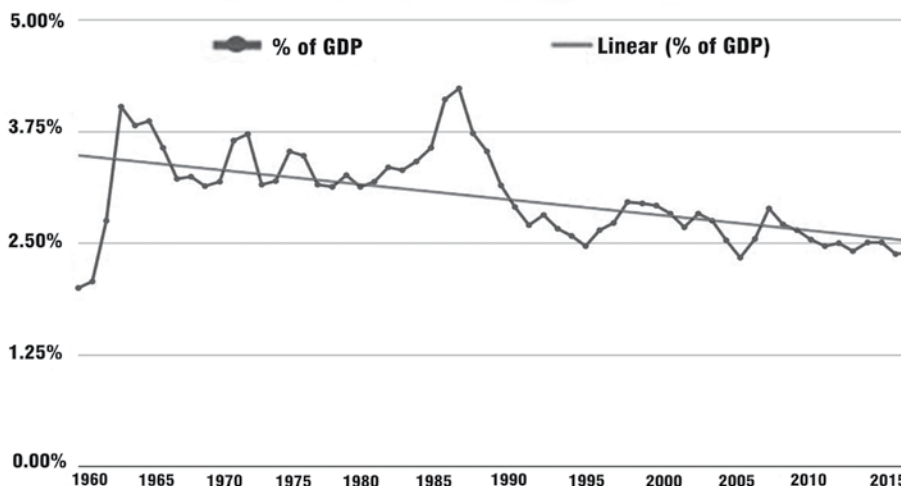
Unconventional Operational Preparedness to respond to terrorist threats in the valley and elsewhere in the country including the LWE has to continue. Ideally internal security tasks are best left to the CPAF but due to the presence of external dimension and proxy war the J&K sector, it should continue to remain under the Indian Army till these disputes are resolved. As and when the proposed Western Theatre command is raised the Corps could be placed under the proposed Western Theatre Command for conventional operations. There is also a recurring demand to deploy the army in LWE. But unless an internal security situation manifests along an international border that too with a cross border content of a serious nature, employment of the armed forces in IS situation should be avoided.

Table 2 : Table Showing Details of Capital Expenditure of Revenue and capital expenditure of Army, Navy and Air Force in 2020-21

	Army	Navy	Air Force
Revenue Expenditure (in Rs cr)	146941	22935	29963
Capital Expenditure (in Rs cr)	32474	26688	43282
Total (in Rs cr)	179415	49623	73245

16 Eurasian Times Desk. "India-China Border Row: India Continues To Upgrade Border Infrastructure As Chinese PLA Looks To Pre-Empt India." May 4, 2021. <https://eurasianimes.com/india-continues-upgrading-border-infrastructure-amid-chinese-challenges-in-himalayas/>. May 16, 2021.

Figure 3 : Defence Expenditure as Percentage of GDP



Revenue Expenditure as % of Total	82%	46%	41%
Capital Expenditure as % of Total	18%	54%	59%

Integrated Border Management capability. CPAF (ITBP and SSB along the Chinese border and BSF in the IB Sector of J&K) units are deployed to manage these contentious borders. The Army also gets involved due to the possibility of a military conflict. Since the CPAF is under the MHA and the Army under the MoD proper coordination and control suffers at the functional level, leading to suboptimal response to any trans LAC/LC/IB incident.¹⁷ Accordingly, it is recommended that CPAF be placed under the operational control of the Army along the unsettled borders.

Availability of Capital Funds for the Land Forces has always been low when compared to the other two services. Our defence budget has been episodic in planning. It shoots up during wars and conflicts like Dokalam and Galwan. See graph at Figure 2.¹⁸ For example, the Army Budget

17 Bajwa M.S. “Chinese order of battle in Aksai Chin: What are we up against?” July 11, 2020. <https://indianexpress.com/article/india/chinese-order-of-battle-in-aksai-chin-what-are-we-up-against-6500207/> . May 16, 2021. Barring mechanised elements Chinese Border Regiments are at par with PLA Infantry Units in terms of communication, leadership and equipment.

18 World Bank. <https://www.macrotrends.net/countries/IND/india/military-spending-defense-budget> . Accessed May 20, 2021.

for FY 2020-21 had only 18% allocation for capital expenditure.¹⁹ See Table 2. Capital expenditure as a percentage of the defence budget has steadily fallen from a high of 36% in 2013-14 to 25% in 2018 – 19.²⁰ The capital budget of the Army needs to be enhanced to a minimum of 30 to 35% of the Army budget allocation.

Conclusion

Other Desired Capabilities for the Land Forces in the current and foreseeable future pertain to greater synergy in intelligence gathering, upgradation of the Special Forces to deal with grey zone threats, electronic warfare, air defence, logistics, command and control, manoeuvre, defence diplomacy and strategic mobility. These are equally important and the Indian Army is hopefully well on course to address them. While formulating our Land Warfare Capability, the Land Forces need to target modernisation in niche areas such as AI, Robotics, UAVs, Space, long range fires, air defence capabilities, creation of joint organisations for better joint war fighting, enhance Cyber, EW, Information dominance capabilities, ramp up the construction of military infra structures and usher in Joint Training so as to improve defence preparedness and mitigate risks due to conventional and grey zone threats. What clearly stands out is the side that can master niche technology and exploit unmanned systems to deliver maximum TNT on the enemy target coupled with deft moves in the grey zone will emerge victorious.

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19 Bhatnagar Aman. India's defence spending in 7 charts. TOI, January 30, 2021. <https://timesof-india.indiatimes.com/india/indias-defence-spending-in-7-charts/articleshow/80600625.cms> . Accessed May 19, 2021.

20 Lt. Gen. Dushyant Singh. "Union Budget 2021 Dashes Defence Expectations." February 18, 2021. The Daily Guardian. <https://thedailyguardian.com/union-budget-2021-dashes-defence-expectations/> . May 16, 2021.

Endnotes

- 1 Insikt Group, Feb 28, 2021, “China-linked Group RedEcho Targets the Indian Power Sector Amid Heightened Border Tensions”, Recorded Future, <https://www.recordedfuture.com/redecho-targeting-indian-power-sector/> (accessed on 25 March 2021)
- 2 Karan, Pradhan . “How China-linked group RedEcho is targeting India’s power grid: The Recorded Future interview10:35:46 IST”, First Post, March 09, 2021. Accessed March 21, 2021. <https://www.firstpost.com/india/how-china-linked-group-redecho-is-targeting-indias-power-grid-the-recorded-future-interview-9393741.html> .