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Message from the Chief Patron

It is my pleasure to introduce the new 33rd issue of **MIRPUR PAPERS**. As one of the oldest in the armed forces, this prestigious publication continues nearly a three-decades-long journey of spreading light in our cognitive world. It will not be overstated if we mention how the journal's influence on our professional philosophy has been so immense, especially to harbour novel thought-provoking ideas, and to make academic research available for connecting with potential policy making.

I compliment the editorial board for pulling together an interesting volume that brings authors exhibiting the assorted extent of ideas related to security and military studies embracing national, international and professional perspectives. We are happy to combine the course participants' scholarly minds and intellectual capacities with the contribution of faculty members and DSCSC alumni.

While I wish this issue will have a certain appeal to general readers in Bangladesh Armed Forces, I am confident that it will generate interest among our readership of scholars and practitioners.

I express my sincere appreciation to all contributors in different capacities who put together admirable teamwork in making the **MIRPUR PAPERS** (Volume 29 Issue 33) a reality.

Maj Gen Md Faizur Rahman, BSP, SGP, ndc, afwc, psc
Commandant
Defence Services Command and Staff College

Editor's Note

Dear Readers

The 33rd issue of **MIRPUR PAPERS** is out, and we are happy to reach it to your hands in the archetypical style. In this issue, the cover page gets back the traditional classic look, the articles form a compendium of assortment, and the contributors constitute a band of practitioner-professionals eager to present their own thoughts, serious research and experiences. Thus, the product conceivably justifies an effort matching its long-earned credibility to continue a journey that began in 1993. In this issue, we have a total of 15 articles written by alumni, faculty, and course participants. The subjects vary from national security studies, warfare, military training, operations, and technology.

The first article, **“Examining China’s Defence Strategy Countering the U.S. in the South China Sea in the 21st Century”** by Captain M Sohul Azam, examines China’s Defence Strategy in the South China Sea which is intended to counter the increasing US involvement in the 21st century. The evolving maritime conflict between these two major powers is dealt with focusing its implications on the Indo-Pacific littorals including Bangladesh.

The second article, **“From Combat Power to Fighting Power in Relevance to Core of Warfare”** by Air Commodore Muhammad Mushtaqur Rahman, has shed light upon the required elements of fighting power. This study has enviably connected the conceptual, spiritual, and metaphysical elements that constitute the critical strength of a force. What forms an absolute novelty is reverting Combat Power into Fighting Power which has been described and analysed at length.

Focusing on climate change, the next article, by Lieutenant Colonel Hamidul Islam, on **“Climate Change as the ‘New’ Security Threat: Implications for Bangladesh”**, discusses climate as a ‘new’ security threat with specific reference to its implications for Bangladesh. The mitigation measures that can be taken to address the foreseeable challenges due to climate change have been identified in this study.

The fourth article, **“Gray Zone: A Significant Mode of War in the Contemporary Spectrum of Conflict”** by Lieutenant Colonel Md Wadud Ullah Chowdhury, highlights the Gray Zone as a significant mode of war in the contemporary spectrum of conflict. It emphasises that developing countries are also employing a range of specific options like military, diplomatic, informational, and economic in response to Gray Zone actions.

Commander S M Abdullah Woise’s article **“The Evolution of Non-Kinetic Threats from Non-State Actors vis-à-vis Armed Forces Integration for Effective Targeting”** focuses on the evolution of non-kinetic threats from Non-States actors vis-à-vis Armed Forces integration for effective targeting. The present trend of all militaries is how to prepare to counter a traditional force. An effort has been made to outline a framework of integration within the Armed Forces and other agencies of a state to effectively target non-kinetic threats.

The sixth article, **“Feasibility of Using Scatterable Mine System as an Alternative to Anti-Personnel Mine”** by Brigadier General S M Anwar Hossain, highlights the feasibility of using a scatterable mine system as an alternative to an anti-personnel mine. It carries out a detailed analysis of the Land Mine Ban Treaty signed in December 1997 to which 153 states are legally bound. The need to adhere to and strictly follow this international agreement by Bangladesh Army has been stressed.

The next article, by Group Captain Md Ahsan Habib, is **“Space-Based ISR (Intelligence, Surveillance, Reconnaissance): A Looming Realities for Developing Nations”** has dwelt upon Space Based ISR (Intelligence, Surveillance, Reconnaissance) which is a looming reality for developing nations like Bangladesh. How Space-based ISR augments the operational efficiency of a military force forms the crux of the discussion.

The eighth article, **“An Introspection into Security and Socio-Economic Implication of Border Road Along South-Eastern Part of Bangladesh with Associated Challenges and Mitigation”** by Lieutenant Colonel Sarker Md Iqbal Hossain, is an introspection into the security and socio-economic implication of a border road along the south-eastern region of Bangladesh (Chattogram Hill Tracts or CHTs) which covers an area of approximately 13,184 square kilometres. The author drives home the point that the border road in CHT will open a new doorway in terms of security and economic emancipation of this region.

“Study of Symmetry and Asymmetry in Indo-China Relations Post 2020 and Future Options” is the ninth article by Squadron Leader Abhishek Tripathi of the Indian Air Force- an overseas course participant. This article achieved the best position in the overseas research category. It is a study of symmetry and asymmetry in Indo-China relations during post-2020 and future options. Qualitative analysis of reference text along with interviews forms the unique aspect of his research methodology.

The tenth article, **“Restructuring the Operational Activities of BN to Enhance Proficiency of its Personnel: A Feasibility Study”** by Lieutenant Commander Mohammad Pranjol Islam, carries out a feasibility study of restructuring the operational activities of the Bangladesh Navy (BN) to enhance the proficiency of its personnel. An in-depth analysis reveals that such restructuring could positively increase the operational efficiency of BN. However, a few suitable changes have been recommended. This article was the best research from the Navy Wing.

The eleventh article, by Major Mir Morshed, is **“Streamlining the Service Length of the Officers of Bangladesh Army: A Way Forward to Harness Professionalism for Organisational Benefit”** which deals with a very important professional aspect of how to streamline the service length of Bangladesh Army (BA) officers. The obstacles to streamlining the service length have been analysed. There is also an endeavour to focus on a way forward to harness professionalism for organisational benefits. This article was the second-best research from the Army Wing.

The next article, **“Employment of Para Commando as Part of Asymmetric Warfare (AW): Bangladesh (BD) Army Perspective”** by Major S M Yasin Nur Siddiqui, essentially focuses on the employment of para commando as part of Asymmetric Warfare (AW) from the perspective of the Bangladesh Army. The challenges of employing para commando have been effectively highlighted through an analytical process. This article achieved the fourth-best position in the Army Wing.

“Enhancing Professional Knowledge to Develop Competence of Junior Officers in Bangladesh Army: An Organisational Approach” is the thirteenth article by Major S M Raik Islam which was the best research from the Army Wing. It has put forward a proposal for a systematic organisational approach to enhance the professional knowledge of the Junior Officers (JOs) of the Bangladesh Army to help developing their competence. The uniqueness of this paper is using statistical tools to quantitatively analyse the findings and coding recommendations.

The fourteenth article, **“Riverine Air Defence Radar: A Viable Option to Complement National Air Defence”** by Wing Commander MD Zahid Ashraf, is about riverine air defence radar which is a viable option to complement and supplement national air defence. The study highlights Bangladesh context by emphasising the ship-building capabilities that enable the construction and maintenance of vessels with low life-cycle costs incorporating appropriate air defence radar for augmenting the operations of Bangladesh Air Force.

The fifteenth and last article, **“Feasibility of Trench Warfare in the Present-Day Context of Urbanisation: An Infantry Battalion Perspective”** by Major Md Fahim Sarwar, sheds light on the problem that due to rapid urbanization, it is pretty challenging to site trenches on the ground. There is, thus, a need for integration of Built-Up-Area (BUA) defence and trench-based conventional defence techniques based on the terrain configuration. The author has proposed some required modifications for SIBs to defend in a blended environment effectively.

At last, we appreciate and acknowledge the efforts and support of the editors, co-editors, contributors, Army Printing Press, and esteemed professors of Dhaka University (advisor editors). **MIRPUR PAPERS** will continue its effort in meeting the expectation of thoughtful readers of military ideas. We look forward to you enjoying it as much as we did while editing and compiling it.

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Examining China's Defence Strategy Countering the U.S. in the South China Sea in the 21st Century

Captain M Sohel Azam, (G), NUP, ncc, psc, BN

Abstract

China's defence strategy in the South China Sea (SCS) has significantly evolved since the beginning of the 21st century. While the U.S. prescribes that no one nation should dominate the Indo-Pacific, China sees the SCS as an integral part of Chinese territory. This opposing stance of two strategic competitors is incompatible with each other. This paper argues that China's 21st century defence strategy in the SCS is evolving in a fashion that puts her in a conflicting course with the U.S. forcing them to interact militarily through competition-heavy mechanisms. China's defence strategy between 2002 and 2019 signifies her increasing competitive notion in furthering the maritime interests in the SCS. The U.S. – China military cooperation-competition continuum also depicts that it fluctuated over the last five decades revealing an 'on-again, off-again pattern.' The analysis of China's defence strategy, military relations with the U.S., and the assertive conduct in the SCS are slowly but surely putting both states on a collision course. Thus a maritime conflict between these two major powers in the future cannot be ruled out that will have many implications for the Indo-Pacific littorals including Bangladesh.

Introduction

The defence strategies and the practices of a state indicate how the events of a potential source of conflict might take shape in the future where incompatible interests exists between the countries. China's strategic documents reflect that her defence strategy in the South China Sea (SCS) countering the U.S. has significantly evolved since the beginning of the 21st century. An analysis of the same through the lens of these changes may shed light on the future stability of the Indo-Pacific and the SCS. Any maritime conflict between these two major powers in the SCS will inevitably have some policy implications for Bangladesh. As such an analysis of the same seems worth examining.

The 2018 U.S. Defence Strategy sets "maintaining favourable regional balances of power in Indo-Pacific..."¹ as a Defence objective while the 2019 U.S. Indo-Pacific Strategy stresses Free and Open Indo-Pacific (FOIP) for the shared prosperity and security for all. "It (FOIP) is a vision which recognizes that no one nation can or should dominate the Indo-Pacific."² The 2022 U.S. Defence Strategy explicitly singles out China as her strategic competitor. However, China being the key player in the region, is increasingly becoming assertive in the SCS. The 2019 Defence White Paper

(DWP) of China outlines “to safeguard China’s maritime rights and interest”³ as one of the fundamental defence goals and the same also asserts that, “the South China Sea islands...are inalienable parts of the Chinese territory.”⁴ These two opposing national positions highlight the conflicting nature of strategic competition in the SCS.

The contested strategy and policy of the U.S. and China essentially question the future stability in the Indo-Pacific seas and the SCS in particular. This paper argues that China’s 21st century defence strategy in the SCS is evolving in a fashion that puts her in a conflicting course against the U.S. forcing them to interact militarily through competition-heavy mechanisms. This argument is supported by the analysis of China’s defence strategies, the pattern of U.S.-China competition and cooperation, and the trend of China’s conduct in the SCS. The paper will also briefly discuss some implications and policy options for Bangladesh in case of a major maritime conflict in the SCS between these two strategic competitors.

China’s Defence Strategy in the SCS

China’s strategic practices were primarily shaped by Confucian philosophy. “Confucianism is often associated with some interrelated terms such as harmony, peace, cooperation, and defence”⁵. These influenced the way China would use force in any given conflict. Confucianism emphasized diplomacy and civil culture/values to subdue adversaries, while Sun Tzu regarded winning the enemy without fighting as the supreme art of war.⁶ The three significant elements of Confucian strategic culture are non-violence, defensiveness, and righteous war.⁷ While it is inclined to pacifist, defensive, and non-expansionist culture, it does not constrain the use of force.⁸ Mao Zedong once said, “If someone does not attack us, we will not attack them; however, if someone does attack us, we will definitely counterattack.”⁹ It indicates the Chinese notion of the use of force based on the Confucian righteous war.

A moral viewpoint to deal with the perceived threat and a righteous war can be socially constructed, such as protecting territorial areas in SCS. Such construction can be seen in the siege mentality among Chinese elites who view the external world as a perceived threat. Therefore, China inclines to use force, often more than required, despite their pacifism norms.¹⁰ China perceives any collective regional or extra-regional interference/intervention in SCS as a threat. Thus emerged the ‘Active defence’ strategy which the 2015 Chinese Defence White Paper (DWP) defines as “Adherence to the unity of strategic defence and operational and tactical offence.”¹¹ The same was reiterated in China’s 2019 DWP.

The DWPs of a country usually reflect its strategic practices, and therefore, an examination of China’s DWPs in the 21st century (from 2002 to 2019) indicates that

China is progressively pursuing more competitive and assertive policy options as depicted below:

Table 1: Analysis of China's DWPs from 2002 to 2019

Defence White Paper	Assertion on regional security environment (SCS, maritime rights, and interests, etc.)
2002	Perceives SCS as basically stable .
2008	Mentions overlapping territorial claims, and maritime rights remain a serious issue, and the SCS region is a hotspot .
2010	Stresses on occasional flare-ups over disputed maritime claims.
2013	Emphasizes safeguarding territorial integrity in SCS despite the expanded military presence of some countries
2015	Proclaims that SCS littorals are taking provocative actions and maintain a military presence on China's reefs while some external countries are meddling in the SCS affairs .
2019	Asserts that the U.S. is strengthening its Asia-Pacific military alliances and reinforcing military deployment and intervention, adding complexity to regional security... illegally enter China's territorial waters... undermining China's national security

Source: Author's self-construct

The progressive changes displayed in Table 1 indicate China's increasing competitive notions for furthering its maritime interests in SCS. The latest edition tacitly singled out the U.S. and portrays her as a threat to China's national security.¹² In the Chinese view, the Freedom of Navigation Operations (FONOPS) by the U.S. to uphold the UNCLOS is contrary to regional peace and stability. To challenge the U.S. FONOPS, China revamped fortifying the Spratly Archipelago and continued construction justifying it as defensive measures and consistently arguing its claim over almost the entire SCS. On the other hand, the U.S. defence strategy in the SCS is heavily dependent on the FONOPS. Although the U.S. asserts that the FONOPS are conducted in accordance with UNCLOS, China perceives them as a threat. Being a nonsignatory of the UNCLOS III also puts the U.S. in a weaker position to capitalize on those laws. Thus, 'Active Defence' against the U.S. FONOPS is becoming a more prominent and consistent Chinese defence strategy.

China also pursues the so-called salami-slicing strategy in the SCS.¹³ This strategy involves changing facts on the ground and gaining evidence at a slow pace to establish a Chinese historical presence in SCS and justify her claims. To that end, China resorts to island occupation, artificial extension, construction of facilities on the island, exploiting resources, and occasional clashes/standoffs with SCS littorals. China signed the Declaration of Code of Conduct in SCS in 2002. However, it avoided

multilateralization of the dispute to pacify ASEAN by using smaller states' opposition as proxy forces. For example, as ASEAN adopts decisions unanimously, Cambodia could block its decision as an extension of the Chinese 'divide and rule' strategy.¹⁴ China also rejected the 2016 verdict of the Permanent Court of Arbitration on the SCS issue that negated the nine-dash line claims and ruled in favour of the Philippines. Such manifested Chinese action in SCS also indicates that they are essentially putting their defence strategy into practice in the SCS very well.

In 2012, Robert J. Art¹⁵ envisaged that the U.S. would remain the world's lone superpower for at least the next two decades, while in 2016, Reveron and Gvosdev¹⁶ envisaged the same for the next 20 years,¹⁷ both pointing to a similar timeframe around 2035. It is worth noting that, according to the 2019 DWP, China aims to complete its military modernization by 2035 and develop its military into a world-class force by 2049.¹⁸ The U.S. Department of Defence interprets the term 'world-class' force as a Chinese military equal or in some cases superior to the U.S. military by mid-century.¹⁹ If China can continue to maintain the current tempo of military modernization, a conflict in the SCS after 2035 cannot be ruled out.

US-China Cooperation -Competition Continuum

At this point, examining the politico-military competition-cooperation continuum between the U.S. and China would reflect on which side of the said continuum their future military interactions are tilting. The political landscapes in both the U.S. and China have consistently shaped the pattern of military relations between these two major powers resulting in regular fluctuation. A chronological summary of significant events that reflects the said fluctuating U.S.-China relationship is shown below in Table-2:

Table-2: Major Events in U.S.-China Relations between 1971 - 2019

Year	Significant Events in Cooperation-Competition Continuum
1971	The U.S. strategic rapprochement with China against Soviet hegemony
1991	End of the Cold War Deng Xiaoping's suppression of Democracy movement The U.S. Congressional sanction on China
1995	Taiwan Strait Crisis China's emerging market George H.W. Bush administration's positive outlook on China
1998	The upturn in military cooperation during Clinton administration U.S.-China summit in Beijing (1997) and The USA (1998)

Year	Significant Events in Cooperation – Competition Continuum
1999	Accidental U.S. bombing on the Chinese embassy in Belgrade Rise of tension between the U.S. and China
2001	Bush Administration's skepticism U.S. EP-3 incident 9/11 Mixture of upturn and downturn in relation
2005	Concept of "Responsible stakeholder" Commencement of Strategic dialogue between the U.S. and China
2009	Obama's broadening of military cooperation to deal N. Korean and Iran issue Global financial crisis U.S.-China Strategic and Economic Dialogue
2010	Chinese assertion heightens in SCS Challenge to the U.S. FONOPS
2011	The U.S. pivot and rebalance to the Asia Pacific
2012	Xi Jinping's assertion as "New Type Great Power Relations" (NTGPR)
2014, 2016	China's first military exercise with China (Cobra Gold) U.S.-China-Australia trilateral exercise U.S.-China MOU on notification of major military activities
2017 - 2019	Trump's skepticism Publishing of U.S. NSS (2017)/ NDS (2018)/ DoD Strategy of SCS (2019) 2019 Chinese Defense White Paper The U.S. singled out China as revisionist power China criticizes U.S. "Cold War mentality"

Source: Author's self-construct

The chronological events mentioned in Table 2 signify that the military relations between the U.S. and China have continuously fluctuated over the last five decades, revealing both instances of cooperation and competition. Until the end of the Cold War, the U.S. maintained a strategic rapprochement to undercut Soviet hegemony. However, this was changed through Deng Xiaoping's military use to suppress the Tianmen democracy movement, and the 1995 Taiwan strait crisis saw a reduction in military cooperation. The inadvertent U.S. bombing of the Chinese embassy in Belgrade during the 1999 Kosovo War seriously undermined U.S.-China relations, and the same was further damaged by the April 2001 incident of the U.S. EP-3 plane collision with a Chinese navy fighter plane. However, the 9/11 attack again resulted in increasing military ties with China for strategic needs to fight global terrorism. As China gained importance in the international system, U.S.-China Strategic and Economic Dialogue

began in 2006. Obama administration sought to deepen the tie to deal with North Korean and Iran issues in 2009, but the Chinese remained suspicious and reluctant to expand cooperation. China assumed a more assertive posture in SCS since 2010, and the political rationale of the U.S. 'pivot' or Rebalance to the Asia Pacific came in 2011. Chinese assertion in SCS has increased under President Xi Jinping, and the Chinese concept of NTGPR gained general acceptance during the Obama administration. China participated in exercises with the U.S. in 2014 and 2016 (Exercise Cobra Gold and RIMPAC Exercise), and a U.S.-China memorandum on notification of major military exercises was signed between the two countries in 2016. However, mutual suspicion was again evident under Trump and Xi Jinping's leadership, reflected in the U.S. National Security and Defence Strategies published between 2017 and 2019 vis-à-vis in the 2019 Chinese DWP.

China's Conduct in the SCS

The SCS is rich in oil, gas and fish, and holds enormous geostrategic importance for trade and commerce; it is worth fighting for and China, playing under its own rules, is the lead contender in this competition. Spratly, Paracel, Pratas, Natuna Islands, and Scarborough Shoal are the major islands and reefs on SCS, and there are overlapping claims by China, Vietnam, the Philippines, Brunei, and Malaysia. As such, scholars see it as a potential place of future conflict, often using the phrase 'Thucydides trap,' describing the possible war between current and rising powers.²⁰ The past events also depict that the SCS dispute paradigm is broadening from a conflict between SCS littorals and China to a conflict between the U.S. and China.²¹ The salient events of the Chinese conduct in SCS are summarized in the table below:-

Table 3: China's Conduct in SCS

Year	Chinese Conduct in SCS
1947	China's claim of eleven dash line
1953	Removal of the Gulf of Tonkin and claim of 'Nine-Dash Line'
1974	Building military installations (airfields, artificial harbour) in Paracel
1987	Physical presence in Spratly island First military clash with Vietnam Sinking of three Vietnamese vessels by the Chinese navy
1996	First military clash with Philippines Navy (Carpenter's island in Mischief reef)
2001	U.S. Navy EP-3 collision with Chinese Fighter plane China detained 24 U.S. Crew for 11 days
2011	Series of Sino-Philippines clash over Spratly island
2012	Chinese illegal fishing at Scarborough shoal China establishes Sansha city on Paracel

Year	Chinese conduct in SCS
2014	China's oil rig (HYSY 981) conflict with Vietnam
2016	Increased activities of China's People's Armed Forces Maritime Militia
2017 to 2020	Revamps assertion in SCS Continues militarizing the area Develops A2/AD capabilities Places anti-ship cruise missile and long-range SAM on disputed Spratly island

Source: Author's self-construct

Table-3 indicates a gradual increase in China's competitive attitude to impose her own rules in the SCS is evident. China currently holds the entire Paracel Archipelago, seven features of Spratly Archipelago, and Scarborough Shoal. In 2012, the Sansha City on Woody Island on Paracel was established.²² "Currently China claims sovereignty over more than 80% of the SCS."²³ China aims to develop sustainable human habitation and continues land reclamation in SCS to be eligible for EEZ claim as per UNCLOS. The construction of military capabilities also provides them with an edge over other claimant states. Such Chinese activities in disputed islands where there are other claimant states are often equated to aggression.²⁴ Vietnam and China disputed over the Vietnamese seismic survey ship in 2011 and over the Chinese oil rig stationing 130 NM off the Vietnam coast in 2012. Between 2010 – 2016, at least 45 violent clashes occurred between China and two rivals, i.e., Vietnam and the Philippines, over island-building/resource exploitation, and at least 16 clashes over fishing resources.²⁵

However, China views the U.S. as a more potent threat than any contested claimant littoral in SCS because only the U.S. can make balances in power in SCS. China heavily resorted to militarizing the SCS, and her assertion was invigorated by technological development in military hardware, submarines, warships with anti-ship missiles and accurate ballistic missiles (such as D.F. 21-D), etc. Hence, the 2020 U.S. Tri-Service Maritime Strategy asserts explicitly that "it (China) represents the most comprehensive threat to the U.S."²⁶

Implications and Policy Options for Bangladesh

It is evident from the above discussion that both the U.S. and China are destined to continually challenge each other in the SCS in the future, and the scenario may alter quite radically after 2035 when China will finally be able to develop a world-class military that matches the U.S. military might. The current trend and tempo also indicate that a potential maritime conflict is looming in the SCS in the future. Such a conflict will have many geopolitical implications for the Indo-Pacific littoral states. States will increasingly face the *foreign policy choice dilemma* of how to address these two

strategic competitors while not antagonizing them. Bangladesh cannot remain isolated during a major conflict between the U.S. and China in the SCS. The U.S. is already revamping coalitions and cooperations with its allies and partners in the Indo-Pacific and so is China. Both are keen to keep Bangladesh on their sides to bolster their respective international standings. While Bangladesh benefits from trading with the U.S., dependency on cheap Chinese technology is also a reality. Therefore, given the impact of globalization and economic interdependence, maintaining a neutral foreign policy posture will be very difficult for Bangladesh if a maritime conflict breaks out in the SCS due to the contested defence strategies of the U.S. and China.

A large-scale maritime conflict between the U.S. and China will adversely impact national trade, slow down economic growth, and have a serious impact on the Defence Cooperation of Bangladesh with these two countries. Bangladesh is heavily dependent on China for various military hardware and arsenals, especially missile technology. Whether China will continue to provide these arsenals and high-end military technology, if Bangladesh morally/internationally supports the U.S.'s position in a maritime conflict, is a serious question. On the other hand, the U.S. is keen to take Bangladesh on board as an international partner to thwart Chinese assertion while not being too inclined to provide the military hardware, technology, and arsenals. Therefore, the foreign policy choice dilemma will be further accentuated due to the grey area in defence cooperation and the supply of military hardware.

Bangladesh needs to have a clearer view of how the maritime scenario is evolving in the SCS in light of the U.S.-China contested defence strategies. Keeping the national interests at the forefront, Bangladesh must assess how best it can preserve its political independence and continue to grow economically. Bangladesh has been maintaining a fine balance in diplomacy with both countries, however, it will be increasingly difficult towards the mid-21st century. Thus, the dependency on China on military hardware, arsenals, warships, and aviation needs to be reduced significantly. This is possible through achieving *self-reliance* by promoting our defence industries, shipbuilding, and defence research and development. Bangladesh also needs to promote and solidify the regional integration as well by looking for win-win outcomes with the regional states so that any international pressure from the U.S. or China can be withstood regionally together. In this context, the ASEAN is a good example of how regional integration can thwart powerful states' intimidation.

Conclusion

China's defence strategy in the SCS has significantly evolved since the beginning of the 21st century. While the U.S. Indo-Pacific strategy is centred on FOIP which recognizes that no one nation can or should dominate the Indo-Pacific, China explicitly asserts the

SCS as inalienable parts of Chinese territory in her 2019 DWP. This opposing stance of two strategic competitors puts them on a conflicting course. A close examination of all the DWP of China published between 2002 and 2019 signifies a chronological change in her increasingly competitive and assertive notion against the U.S. in furthering the maritime interests in the SCS. While China's 2019 DWP singles out the U.S. as a threat to Chinese national security, the 2022 U.S. Defence Strategy explicitly mentions China as her strategic competitor and lays down the ways and means to contain China. Accordingly, China's concept of 'Active defence' strategy is already in play in the SCS to counter the U.S.'s strategy of FONOPS.

An analysis of the U.S.-China military cooperation competition continuum also depicts that the relations were consistently influenced by the prevailing political landscapes. Since the U.S. strategic rapprochement with China in 1971, their military relations have continuously fluctuated over the last five decades which reveals an 'on-again, off-again' pattern. It signifies that their relations will continue to be influenced by the competition-heavy mechanism. China's increasingly assertive conduct in the SCS also is a serious cause of concern for the U.S. that might well lead to the 'Thucydides trap' meaning a possible conflict between a current and rising power. An analysis of the Chinese conduct in the SCS since the mid-twentieth century to date signifies a gradual increase in Chinese competitive attitude and her will to impose its own rules in the SCS. Hence, it is not surprising that the 2020 U.S. Tri-Service Maritime Strategy explicitly mentions that China is the most comprehensive threat to the U.S. in the Indo-Pacific.

The analysis of China's defence strategy, military relations with the U.S., and assertive conduct are slowly but surely putting both states on a collision course. Hence, both states will continue to interact militarily through competition-heavy mechanisms. A maritime conflict between these two major powers in the future cannot be ruled out that will have many detrimental implications for the Indo-Pacific littorals including Bangladesh. The political leadership will face a foreign policy choice dilemma to address these two strategic competitors while trying to antagonize none. More importantly, a large-scale maritime conflict between the U.S. and China in the SCS will inevitably impact Bangladesh's national trade, slow down economic growth, and grow uncertainties in the supply of military hardware. Therefore, Bangladesh needs to reduce its China dependency, achieve self-reliance in defence industries, and promote mutually beneficial regional integration to thwart the U.S.-China intimidation in the twenty-first century.

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Brief Biography



Captain M Sohel Azam, (G), NUP, ncc, psc was commissioned in 1998 on successful completion of his training at Britannia Royal Naval College, UK. His command includes missile boats, patrol craft, large patrol craft, and a frigate in BN. He also served as Deputy Director of Naval Plans at NHQ for over three years. He was awarded the "Navy Medal of Excellence" in 2019 for his meritorious services. He is a graduate of DSCSC, Mirpur, and also completed Naval Staff Course from Pakistan Navy War College, Lahore. He obtained a Master of Science in 'Peace, Conflict, and Human Rights Studies' from the Bangladesh University of Professionals (BUP) in Dhaka in 2018. He also graduated from the US Naval War College obtaining a Master of Arts in National Security and Strategic Studies in 2021. He is currently serving as the Zonal Commander of the Bangladesh Coast Guard East Zone.

From Combat Power to Fighting Power in Relevance to Core of Warfare

Air Commodore Muhammad Mushtaqur Rahman, BSP, BPP, afwc, psc, ADWC

Abstract

This article has unfolded much-required elements of Fighting Power. The need for intangible elements therein has been underscored. With the motion of military combat in manoeuvre and firepower, the foundation of the man behind the machine is ignored. To remove such a perplexing situation, this study has enviably connected the conceptual, spiritual, and metaphysical elements that constitute the critical strength of a force. However, the empirical process of reverting Combat Power into Fighting Power is an absolute novelty of this literature.

Introduction

In military studies, physical elements generally dominate as pivotal instruments in the exercise of power. The affairs of metaphysical elements are ignored at a time in the face of materialistic viewpoint. Military manuals and pamphlets have hardly underscored the requirement of mental and moral elements, except by mentioning them in places with mere apathetic expressions. Although some intangible aspects including leadership are being mentioned quite significantly, the innate humane faith and spirit, that go beyond immediate intangibles, are very often missed out. The physical and objective instruments are ignored. Of late in the military services, the concept of moral elements is floated to bond between combat and fighting power. But the conversion between them as supposed has got some flaw of isolation. This paper will deal with this very concept to set the core principles of warfare.

‘Fighting Power’ as Moral Factor

This important phenomenon can be discussed in different aspects. These are:

Faith-Based Approach in Wars: Quite opposite to the physical domain of warfare, the psychological/spiritual domain also becomes an area to bring changes in the conduct of war. This is exemplified by the ancient wars.¹ Prophet Usha (Joshua) Ibn Nun (peace be upon him) launched a war against Israel against very powerful armies of Amaleks. His companions were afraid of such an expedition because of the might of the enemy. But Prophet Joshua (PBUH) gains strength from these words of Prophet Moses (PBUH):

“And Moses called Joshua, and said to him in the sight of all Israel: Be strong and of courage, for you shall go with these people into the land which the LORD has sworn to their fathers to give them; and you shall cause them to inherit it.”²

Finally, Joshua won the war.³ And the Al Qur'an also testifies:

“It has often happened that a small group by the grace of Allah has vanquished a mighty army. Allah is with those who endure with patience.”(*Al Qur'an* Surah- 2, Ayat 249)

This is evident in numerous battles and wars in Muslim history, be it during the period of Prophet Muhammad (SM) at Badr (624CE), or at Yarmurk (636CE) by Khalid Bin al Walid (592-642CE), or by Alp Arsalan at Manzikart (1071CE), or by Sultan (Fatih) Mahmud at Constantinople (1453CE). In the present times when Afghan Mujahedeens fought back the mighty Soviet invasion from 1979-89 and Hezbollah defeated boastful Israel in the Second Lebanon War (2006), and the Taliban achieved victory over the mighty US military force on 15 August 2021, this Truth has once again been proved. Needless to mention that even Jew Israel, claiming themselves a follower of Moses (PBUH) and Judaic Faith, had carried out incredible series of air strikes over *Canaanites* Egypt in the 1967 War being inferior in air power. Surely, their courage was not solely a secular byproduct. Nonetheless, courage may also be a secular byproduct yet not non-idealistic in full, like of Russians, Vietnamese, and Chinese, powered by the moral cause of patriotism and *Proletarian* ideology.

Peoples War: The 7th March 1971 speech of Bangabandhu Sheikh Mujibur Rahman (Father of the Nation) has given a certain strategic directive which was adhered to during the Liberation War (LW) of 1971, some of them were spirited to more fighting power than of combat power (“সাত কোটি বাঙালীকে দাবায়ে রাখতে পারবা না, রক্ত যখন দিয়েছি আরও দেব তবুও এদেশকে স্বাধীন করে ছাড়ব ইনশাআল্লাহ”). Agreed that like all lethal bloody battles, the LW had combat actions including manoeuvres and such operation plans; allied forces' have also joined later with combat capabilities though no denying the fact that the instilled fighting power and fearless patriotism of freedom fighters have, that was unmatched with all these combat/operation plan and elements. The effort of KILO Flight converting far old utility air platforms into fierce fighters and carrying out strategic air offensive may be linked with combat ways and means; but if anyone talks to the KILO Flight warrior, as this author had numerous opportunities, it has inspiration from invaluable fighting power. Else they had this fighting power, it would be insane to convert old transport aircraft and helicopters unused for any Air Force, were converted into combat air platforms to fight against an updated professional military, in 1971.

Half a century away these events may appear little different to today's warfare where technological devolvement has defined military effectiveness far reached. But it is not. Specific mention may be made to the events of the Soviet invasion of Afghanistan in 1979 and Hezbollah resistance which took place first in 2000 and then in 2006. The

ongoing conflict in Ukraine is also a case study. Ukraine crisis started years before when Russia invaded Crimea in 2014. Russia launched special military operations against Ukraine on 24 February 2022. War analysts, political scientists and military commanders have given their opinion and comments on the Russo-Ukraine War which are still contextual and highlighted below:

The significance of morale in military victory is recognized throughout history but, at present, the overwhelming focus on high-technology weapon systems as a source of victory on the battlefield results in a gap in the social science literature about the importance of morale in a 21st-century military conflict. Certainly, expert application of the operational art is important and so is equipment and logistical support but, the Russian military and pro-Russian forces have the advantage in these areas. So, is the morale of the Ukrainian troops the mitigating factor levelling the asymmetric differences? If so, then the implications of morale for academic research and the practical importance of 21st-century warfare merit more attention.⁴

The West makes the Ukrainian people a paragon of heroism while national resistance movements in the Middle East are labelled as terrorists.⁵

It is not only about capabilities, technology, and weapons, but it is about the will of people to fight for their own nation....Ukrainians of all ages have been taking up arms against invading Russian forces.⁶

‘Fighting Power’ in Western Military Literature: The US Land Force defines Fighting Power as “the ability to fight” consisting of three essential, interrelated components (or ‘planes’), the physical, intellectual and moral.⁷ Martin van Creveld’s definition says: “the sum total of mental qualities that make armies fight.” Built on mental, intellectual and organizational foundations, Fighting Power is manifested “in one combination or another” as discipline and cohesion; morale and initiative; courage and toughness; and willingness to fight and readiness to die.⁸ The term ‘readiness to die’ needs deeper reflection in regards to ‘faith’ and ‘rejection’. Rejectionist philosophy requires far stronger moral motivation to die that believes as “They say: What! when we are reduced to bones and dust, should we really be raised (to be) a new creation?” (Al Qur’an Surah-17 Ayat-49); whereas it is easy to motivate people of faith in hereafter to die because “Let those fight in the cause of Allah Who sells the life of this world for the hereafter. To him who fighteth in the cause of Allah,- whether he is slain or gets victory - Soon shall We give him a reward of great (value).” (Al Qur’an Surah-4, Ayat-74).

‘Fighting Power’ Through System of System Analysis (SOSA): SOSA has a vast connotation of how a system has its backward linkage of sub-systems. SOSA refers huge option for mental and moral affairs since it moves deeper enough into the system to a sub-system, and sub-system to a further subsystem. The following expression

refers that SOSA may hold the moral elements quite clearly when it is referred to a ‘range of homeodynamic efficiency (RHE)’ that denotes:

An abstract characterization of the relationship between environmental stressors (including physical, cognitive, and emotional types), the state of intra-human mind/body communication pathways, and homeodynamic effectiveness...⁹

A few important elements are discernible here. Although the ‘cognitive and emotional types’ do not necessarily refer to faith, it can be a strong determinant of that.

Conversion of Combat Power into Fighting Power

This conversion is achieved as follows:

Dynamics of Combat Power: To achieve victory at minimal cost commander seeks to apply overwhelming combat power. Combat power is created by combining the elements of manoeuvre, firepower, protection, and leadership. Their effective application and sustainment, in concert with one another, will decide the outcome of campaigns, major operations, battles, and engagements. Leaders integrate manoeuvre, firepower, and protection capabilities in a variety of combinations appropriate to the situation.¹⁰ Rather, it is imperative that the dynamics of combat power be integrated and well-sequenced for optimum achievement. For example, fires are used to create opportunities for manoeuvre. The US forces’ manoeuvre in Iraq War reveals vividly that it was planned to avoid strength. US 3rd Infantry Division made a manoeuvre towards Karbala from the west and 1st Marine Expeditionary Forces advanced towards Baghdad from the east. The firepower played its dynamic between 2nd and 10th April 2003: in the battle of Al Hillah, south of Baghdad, US 101 Airborne Division concentrated huge fire support both from the air and ground-based fire assets to clear the southern entry to Baghdad. This was an example of the use of firepower of the Air Force in support of a quick invasion of land.¹¹ Now, when all four dynamics of combat power combine, it is like a quadrant of musical fit. But, it does only combination, not synergy; and the combination might decay without a cognitive element of synergy. Here comes the moral element in the dynamics of combat power. “Fighting Power represents the moral complement to combat power. It is the synergy of moral factors within a military unit that creates moral force. The moral force allows a unit to withstand casualties and setbacks and successfully engage in extended combat. The generation of fighting power allows a unit to impose its will upon the opponent.”¹²

Integration of Morale elements into Combat Element: It is agreed well that moral elements can enhance combat power to a level of fighting power. But there should be a clear idea whether the moral element is to be added up with composite combat power or it would be added up with dynamics of combat power separately. It is perceived that the latter concept is better where each element of combat power is

added with the moral element separately. It can be expressed arithmetically in the following way:

Consider, C= Combat Powers, M= Moral Elements, F= Fighting Power

mv = manoeuvre, f = firepower, p = protection, l= leadership

First Version $\sum C + M = F$ [When moral element is added up with composite combat power] In such case, moral elements (faith) would be added up with the sum of combat power:]

Second Version $M \times \sum C = F$ [Added up with dynamics of combat power separately]

$$M \times (mv+f+p+l) = F$$

$$m \times \{M + f \times \{M + p \times \{M + l \times \{M = F$$

The moral coefficient for each element of combat power may be arranged in the following table:-

Table-1: The Moral Coefficient for Each Element of Combat Power

Element of Combat Power	Dynamism	Coefficient (Spirit) of Morale Element
Manoeuvre	Move of combat forces to gain positional advantage, usually in order to deliver - or threaten delivery of - direct and indirect fires	And don't be weak in the pursuit of the enemy; if you are suffering (hardships) then surely, they (too) are suffering (hardships) as you are suffering, but you have a hope from Allah (for the reward, i.e. Paradise) that for which they hope not, and Allah is Ever All-Knowing, All-Wise. (<i>Al Qur'an</i> , Surah-4, Ayat-104)
Firepower	Provides destructive force; it is essential in defeating the enemy's ability and will to fight Can be direct or indirect, even non-lethal	And He sent against them Flights of Birds, Striking them with stones of baked clay. Then did He make them like an empty field of stalks and straw, (of which the corn) has been eaten up. (<i>Al Qur'an</i> , Surah-105, Ayat 2-3)
Protection	Conserves the fighting potential of a force so that command can apply it at the decisive time and place	Those who disbelieve wish, if you were negligent of your arms and your baggage, to attack you in a single rush, but there is no sin on you if you put away your arms because of the inconvenience of rain or

		because you are ill, but take every precaution for yourselves. (<i>Al Qur'an</i>, Surah-4, Ayat-102, later part) When you O Messenger Muhammad (SM) are among them, and lead them in As-Salat (the prayer), let one party of them stand up [in Salat (prayer)] with you taking their arms with them; when they finish their prostrations, let them take their positions in the rear and let the other party come up which has not yet prayed, and let them pray with you taking all the precautions and bearing arms. (<i>Al Qur'an</i>, Surah-4, Ayat-102, initial part)
Leadership	Leaders integrate manoeuvre, firepower, and protection capabilities in a variety of combining appropriate to the situation	And obey Allah and His Messenger, and do not dispute (with one another) lest you lose courage and your strength depart, and be patient. Surely, Allah is with those who are As-Sabirin (the patient ones, etc.) (<i>Al Qur'an</i> , Surah-8, Ayat-46)

Source: Author's self-construct

'Fighting Power' as Centre of Gravity (CG)

This is discussed briefly in subsequent paragraphs:

The CG Analysis: CG analysis seeks to determine the relative strengths and weaknesses of the principal protagonists. The Critical Capability (CC) of fighting power can deliver the both offensive and defensive ability to deny any probable adversary. Its Critical Requirement (CR) includes both the Joint Forces' firepower and the morale of the men behind the firepower. Now, if in any case the moral can be made fragile, it appears as Critical Vulnerability (CV). But if the moral is protected by 'faith in Allah with patience' and the unity amongst the forces (refer to the verse *Al Qur'an*, 8:46), then it is very difficult to penetrate. If faith itself is weak in nature, it turns a lucrative CV to the adversary. We may look into the 'ways' to disrupt this fighting power so that we can protect this CR if it turns into a CV for us, as well as if we can attack our adversary's one. JDP 5-00 (2nd Edition) gives us a nice clue here; it suggests that it should be 'predominantly indirect ways and means to target the conceptual and moral components of an opponent's fighting power.'

‘Fighting Power’ as CG in Level of War: Generally, at the operational level, the CC-CR-CV remains more tangible and that may move intangible as the level of war goes up. Thus, the ‘Combat Power’ of the forces may appear as a CG at the Operational level with its objective derivation of total Order of battle (ORBAT), and the ‘Fighting power’ might turn into a CG at Strategic Level. However, it must not be forgotten that the morale of a soldier exists at the field level, but its CG analysis derivatives match at a much higher level. So, when this intangible CR is taken up its impact at all levels, It may be dealt with it as operational art at a higher level. It is also deduced that keeping the morale of soldiers high is important by saying ‘Do not worry, they are not much in number.’ As Allah says:

And remember) when Allah showed them to you as few in your (i.e. Muhammad's sm.) dream, if He had shown them to you as many, you would surely have been discouraged, and you would surely have disputed in making a decision. But Allah saved (you). Certainly, He is the All-Knower of what is in the breasts. And (remember) when you met (the army of the disbelievers on the Day of the battle of Badr), He showed them to you as few in your eyes and He made you appear as few in their eyes so that Allah might accomplish a matter already ordained (in His Knowledge), and to Allah return all matters (for decision). (*Al Qur'an*, Surah-8, Ayat-43, 44)

Hamza Yusuf, a US Islamic scholar explains this verse in a way that actually the *Qafir* (Non-believers) were less, because despite the numerical superiority, they did not have Allah with them, and the *Mumin* (The believers) were more because, despite numerical inferiority, they had Allah with them.¹³ Here it is found that the CC of Combat Power (Enemy ability to exert better ORBAT) is subdued by the CR of Fighting Power (Having faith in Allah/Creator).

Conclusion

There are twofold understanding of exerting ‘Fighting Power’ in us. Extreme caution should be exercised while relying on any metaphysical elements. For a smaller force, it is to enhance our Combat Power so long it is objectively poorer than that of our adversaries. However, the value of morale is indispensable that composes the core of fighting power. Weaker Forces like us, if wish to exploit the critical vulnerability of stronger forces in an asymmetric setting, should not rule out spirit and morale elements. To conceptualize the conceptual component of Fighting power, in our military academics, spiritual motivation on faith-based warfighting capability should exist more dominantly. It may be asserted that, reasonably to our soldiers, sailors, and airmen that ‘you are invincible’ powered by faith. This is the effective way to bring an equation to warring parties ‘Fighting Power.’

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Brief Biography



Air Commodore Muhammad Mushtaqur Rahman, BSP, BPP, afwc, psc, ADWC was commissioned in BAF on 03 January 1991. His professional training includes Basic ADWC course at the Fighter Controllers Training Unit (FCTU), Ground Control Interception course at the School of Air Defence and NATO Air Defence Ground Environment (NADGE) in Turkey, AD Command Orientation course at AD System School at Lahore in PAF and Squadron Commander's Orientation Course at College of Air Warfare at Hyderabad in IAF. He has served throughout in different Air Defence (AD) units and

training institutes of Bangladesh Air Force in operational, staff and instructional capacities; those include commanding four radar Squadrons and one Radar Unit; working as Chief Instructor at FCTU and 2-I-C at ADOC, and commanding Command and Staff Training Institute of Bangladesh Air Force. He has completed the Air Staff course at DSCSC in Mirpur, Command and Staff course at Air Force Command College in Beijing and Armed Forces War Course at National Defence College in Dhaka. He has served as Directing Staff both at DSCSC, Mirpur and at AFWC Wing in NDC. He also had brief instructional tours to Defence Services Command and Staff College at Colombo to present and conduct the Joint Warfare workshop twice in 2012 and 2014. He served in Mission Air Operations Centre in Kinshasa under UN Mission in DRC from 2005-06. He has completed an MBA from the Institute of Business Administration (IBA), Dhaka University and MDS from National University. He is presently undergoing National Defence Course 2023.

Climate Change as the ‘New’ Security Threat: Implications for Bangladesh

Lieutenant Colonel Hamidul Islam, psc, Engineers

Abstract

Climate Change (CC) is affecting human life in an unprecedented way by degrading environmental factors. People are becoming homeless due to the multiple adverse effects like soil erosion, salinity intrusion, sea-level rise, etcetera. Hence, CC is poised to become one of the major drivers for population displacement or migration. These homeless people are directly interlinked with the overall security of the nation, as they become the most vulnerable group. In this research, an in-depth study is done to find out how this security threat gets manifested by the changing pattern of climate in Bangladesh (BD). A mixed-method research methodology is followed to investigate the research problem, where both qualitative and quantitative data are collected. A survey is conducted among the conscious people of BD working in different disciplines. In addition, senior officers, academicians, researchers, and professionals in relevant fields are interviewed as key informants. Finally, the mitigation measures that can be taken to address the foreseeable adversaries due to CC are identified in this study.

Introduction

Climate Change (CC) is no more a future prediction but rather an ongoing event which is going to intensify in the coming years and impact severely on human life. Each of the last three decades has been found successively warmer at the Earth's surface than any preceding decades since 1850.¹ This temperature rise is the main cause of melting ice and glaciers, thereby mean sea-level is following an uprising trend. The outcomes of rising sea-level are likely to be loss of lands in the coastal area and emerging resettlement problems for a large amount of the population worldwide.

Bangladesh (BD) is a disaster-prone country. BD's vulnerability to CC impacts is due to a combination of geographical and socio-economic factors. Its geography lies as such; flat, low-lying with riverine features and socio-economic factors include high population density, poverty level, and agriculture-based economy. In the year 2020, BD ranked seventh in the list of countries most affected by climate calamities during the period 1999–2018.² Analysis of meteorological data from 1977 to 1998

clearly shows annual sea-level rise at the rate of 7.88 mm, 6 mm, and 4 mm respectively in Cox’s Bazar, Chardanga at Hatia and Hiron point at Sundarbans.³ Sea-level rise alone has various consequences in BD which will cause floods, riverbank erosion, salinity intrusion, crop failure, loss of biodiversity and many more.

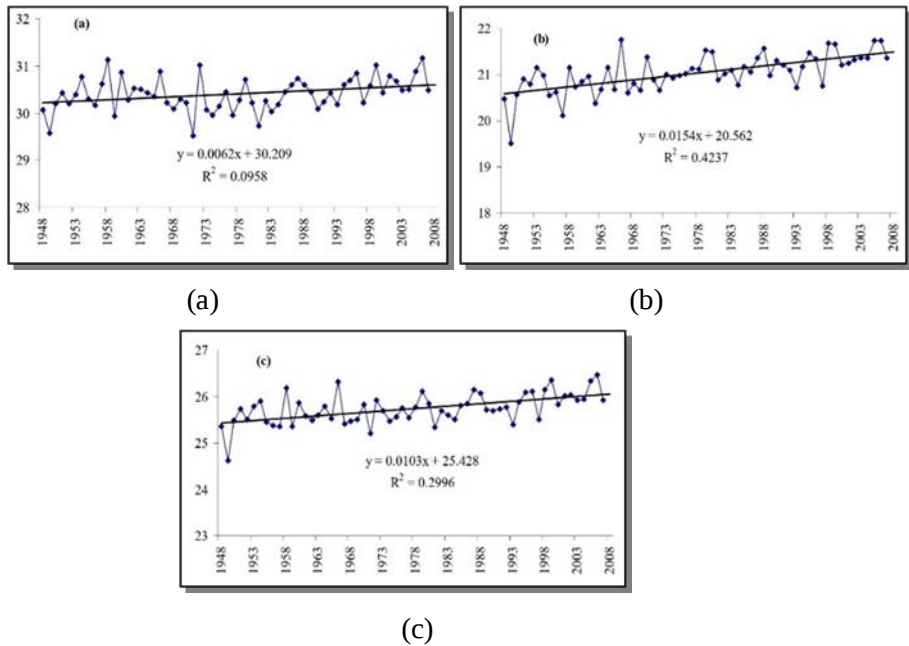
Perhaps, the biggest threat for BD will arise from the loss of human habitation which can trigger internal displacement and mass migration and which will create a large number of climate refugees. It has been estimated that by 2050, one in every seven people in BD will be displaced by CC, and up to 18 million people may have to move because of sea-level rise alone. Moreover, it will affect individuals among the migrated people which will cause hunger, disease, malnutrition and poverty. The displaced people will face tremendous unemployment problem, and they are more likely to be involved in robbery, smuggling and other social crimes. As the resources of the country are limited and will be further reduced for the CC, there will be huge competition over scarce resources. In turn, this unhealthy competition can lead to a total collapse of social cohesion and trigger conflict among different social groups. Thereby, apart from the potential consequences in the field of food, health, and energy, it will heighten existing social and political tensions, trigger new conflicts, and surface new security threats.

Impacts of Climate Change in Bangladesh

Environmental impacts are characterized by the alteration in the pattern of typical natural phenomena that adversely affect the global ecosystem. BD is experiencing many adverse impacts of environmental degradation. Some of the major environmental impacts are as follows:

Rise of Temperature: Nowadays we experience extreme heat in summer which prevails for a prolonged period. BD experiences the highest value of heat index in the month of May when it crosses 45°C in some parts of the country.⁴ Considering the last 60 years (1948-2007) temperature data, it has been found that the daily mean temperature has got a positive trend of increasing at a rate of 1.026 ± 0.403 °C per 100 years.⁵

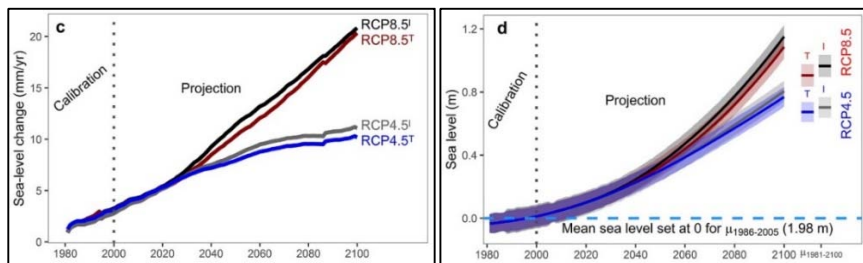
Figure 1: Trends of Daily (a) Maximum, (b) Minimum and (c) Mean Temperature Based on the Period of Last 60 Years Data 1948-2007



Source: Islam, 2009

Sea Level Rise (SLR): There is clear evidence of CC in BD which is causing changes in the precipitation, increasing annual mean temperature and SLR. In a study, it is shown by a semi-empirical sea-level projection where the yearly sea-level change rate sharply increased under Representative Concentration Pathways (RCP) 8.5. It can be as high as 21 mm/year by 2100 while it was less than 1.5 mm/year in 1980.⁶

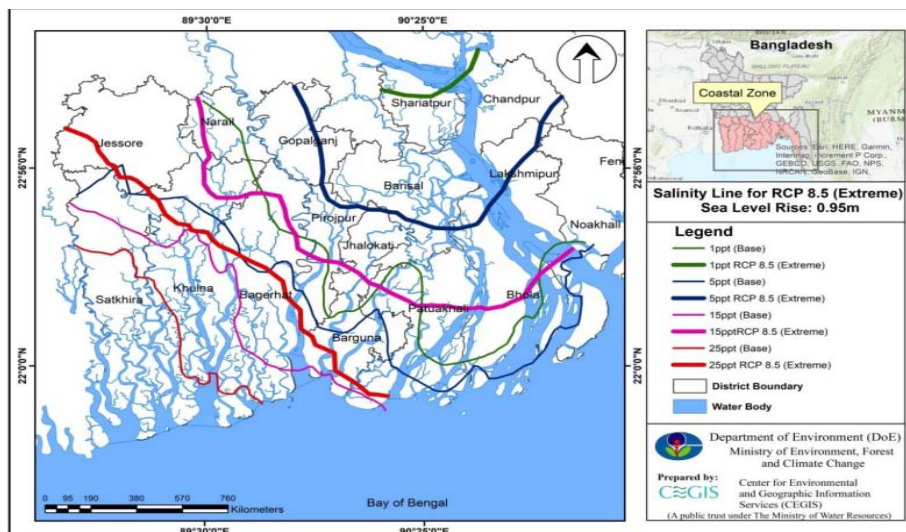
Figure 2: Projected Rate of Sea-Level Change using Different RCPs and Projection Algorithms



Source: Hasan et al., 2020

Salinity: Salinity in the river water happens due to both climatic and anthropogenic factors. The backwater effect due to tidal surges is also responsible for salinity intrusion in coastal areas. Another non-dynamic and long-term backwater effect is likely to be caused by SLR which will raise the level of water at the mouth (estuary) of a river.⁷ Figure 3 shows the intrusion of saline water due to CC condition and an SLR of 0.92 meters.⁸

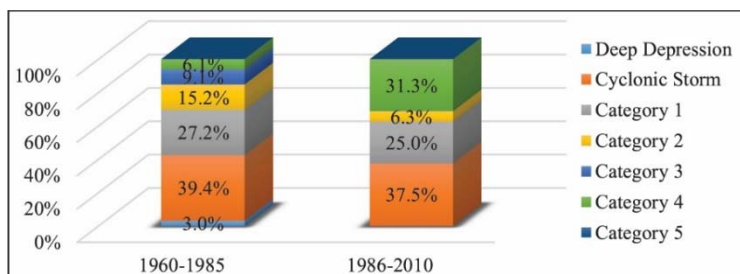
Figure 3: Surface Water Salinity Intrusion under Baseline (2011) and Future CC Condition with 0.92m SLR under RCP 8.5



Source: DoE, 2021

Tropical Cyclone and Storm Surge: The Bay of Bengal is a known breeding ground for tropical cyclones that hit the coastal area of BD during pre-monsoon (April-May) and post-monsoon (October–November) seasons.⁹ It is seen that category 4 cyclones (wind speed 209-251 km/hr) increased to 31.25% between 1986-2011 time frame which was only 6.1% between 1960-1985.¹⁰ The following figure shows the change of intensity of cyclone according to Saffir-Simpson scale.

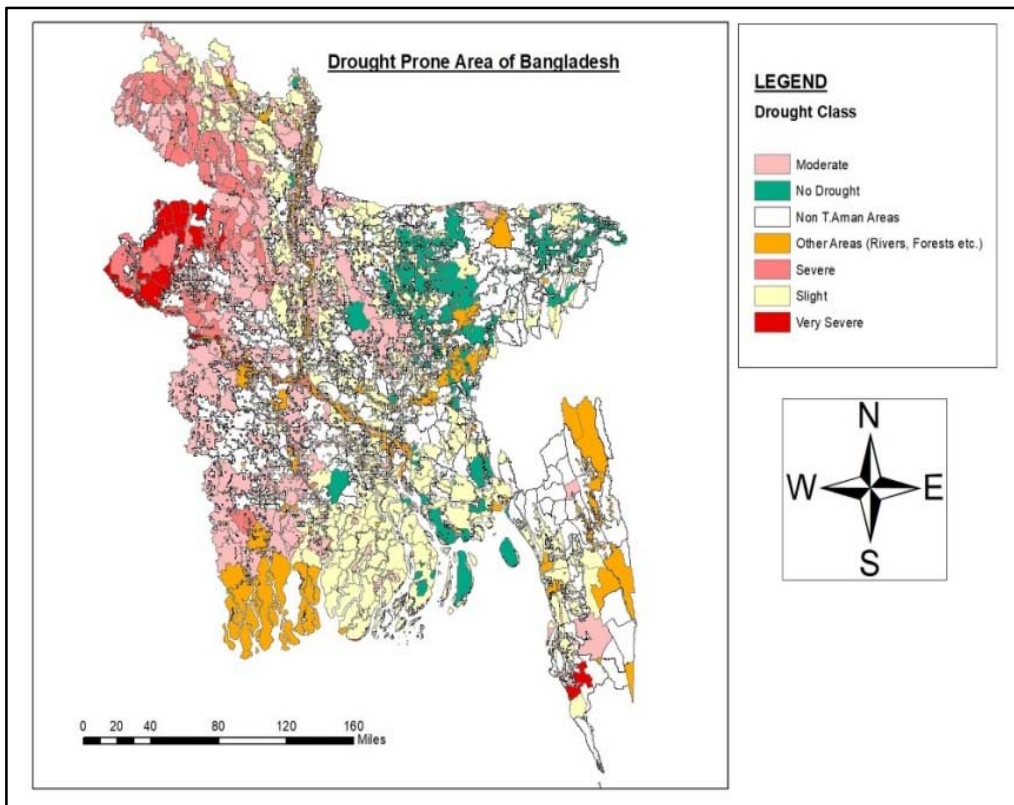
Figure 4: Comparison of Frequency of Cyclone Intensity in BD over Time;



Source: Saha & Khan, 2014

Drought: BD has experienced a number of major droughts in recent history. The 1973 drought was labelled ‘the worst in recent history,’ the 1979 drought was ‘the worst in living memory,’ and the 1994-95 drought ‘the worst in this century.’¹¹ Future drought may increase the probability of a dry year with a certain percentage of below-average rainfall, by 4.4 times by 2050.

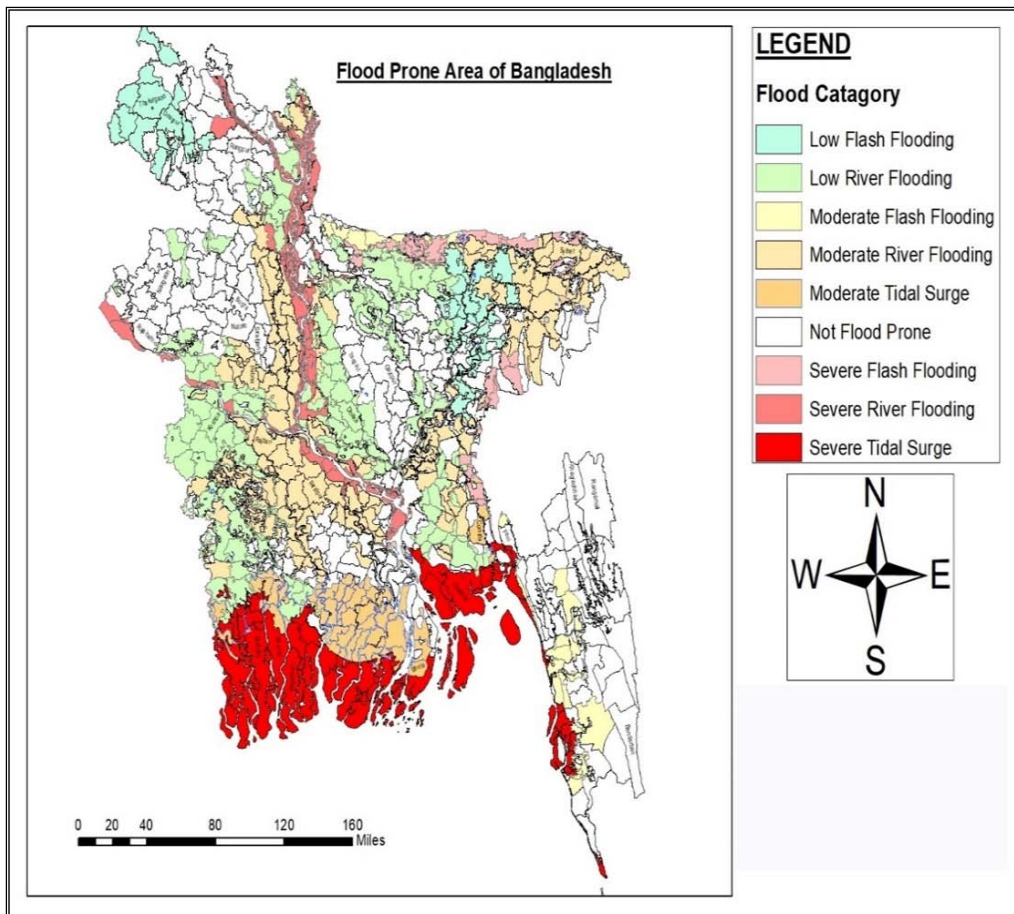
Figure 5: GIS Map of Drought-prone Areas of BD



Source: Author's self-construct

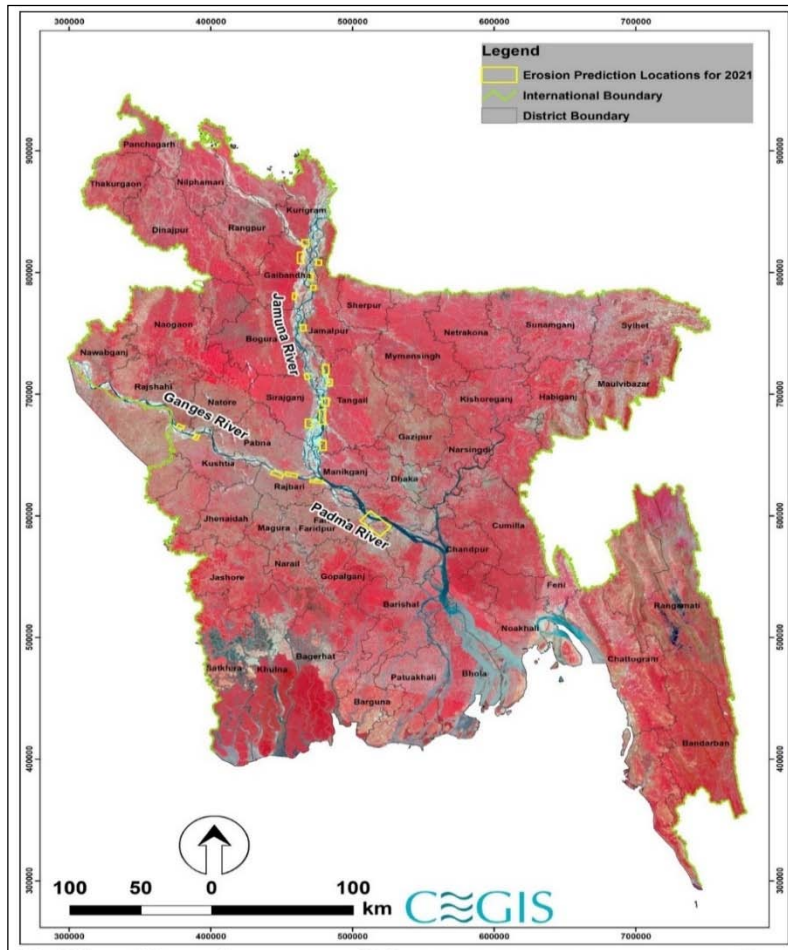
Rainfall and Flood: Being located within the flood plains of three major rivers: the Ganges, the Brahmaputra and the Meghna, flood is a regular event in BD during the monsoon period. The most recent widespread flood in the month of June 2022 at northeastern BD has caused nearly 7 million people stranded which can be described as potentially the country's worst flood since 2004. A future increase in precipitation along with SLR due to CC will cause more devastating floods during monsoon.

Figure-6: GIS Map of the Flood-prone Area of BD



Source: Author's self-construct

Riverbank and Coastal Erosion: For long, erosion has become a regular natural phenomenon along the bank of different rivers and the belts of coastal islands like Bhola, Sandwip, Hatia and Kutubdia, which has dramatically increased in recent years. For example, the area of Sandwip Island was 1,080 sq km in 1780, but now it has been reduced to only 238 sq km; and in Hatia, erosion is taking place at the rate of 400m/year.¹² The below figure shows the erosion-prone area of major rivers of BD.

Figure-7: Riverbank Erosion-prone Area

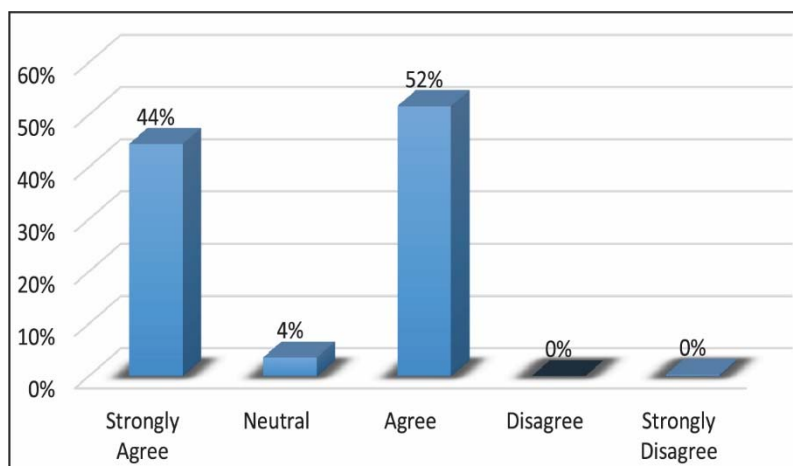
Source: CEGIS

Due to the CC, the most vulnerable sector is water resource management.¹³ Nowadays, rainfall becomes erratic and intense. Thereby, flash flood becomes a common issue in urban areas due to the shortage of adequate drainage system. Similarly, in the dry season, due to the drought, many districts of the northern part of BD face a huge shortage of adequate water to cultivate their land. Agriculture is going to be the second most affected sector in BD.¹⁴ Most of the people of our country rely on agriculture for their livelihood. Agriculture is primarily dependent on appropriate water resource management. Due to the drought and salinity intrusion, both the southern and northern parts of BD will be affected.¹⁵

Due to the changing pattern of the climate, several diseases like dengue, malaria, diarrhoea, etcetera outbreak every year.¹⁶ Due to the erratic behaviour of rainfall,

many parts of BD get waterlogged. Subsequently, those places turn into a suitable breeding ground for mosquitos which is the only carrier of dengue viruses. Between 2008 and 2014, disasters in BD due to CC are believed to have displaced 4.7 million people.¹⁷ BD was among the top countries in the world with the most disaster-related internal displacement in 2019 with an estimated 4.1 million new displacements. In a survey conducted by the researcher, it is seen that 96% of responders believe, due to CC internal displacement will take place and people will suffer due to poor livelihood.

Figure 8: Responses Showing Internal Displacement Due to CC



Source: Author's self-construct

Security Implications of Climate Change in Bangladesh

Climate induced-security threats can be analyzed in two dimensions for BD- nontraditional security threats and traditional security threats.

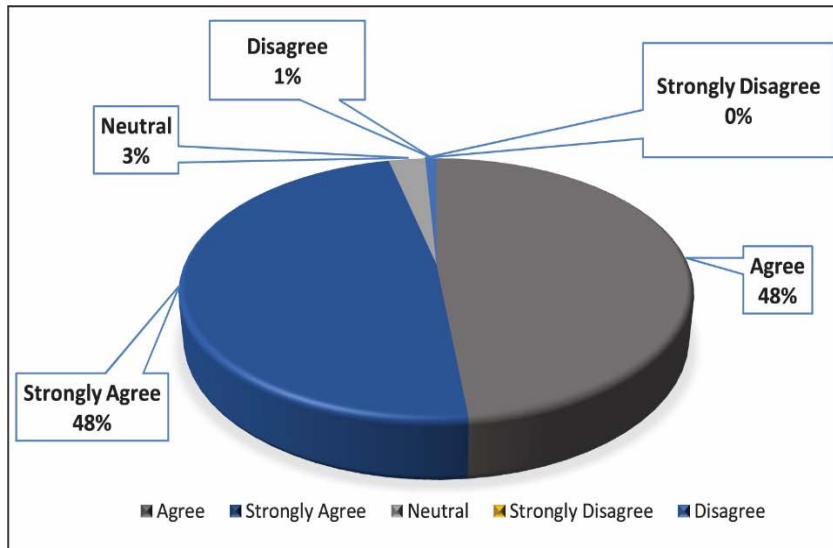
Nontraditional Security Threat

Nontraditional security threats (NTST) can be those which refer to factors other than military, political and diplomatic conflicts but can pose threats to the survival and development of a sovereign state. For a comprehensive analysis, broad branches of climate-induced NTST for BD are described below:

Being a smaller state with a high-density of population, BD is extremely vulnerable to the CC, especially in ensuring food to her 170 million people. Once the food will be scarce, it will give birth to other security issues. Because a hungry individual can be violent to society in any action for his existence. Frequent theft, robbery, apprehension of other's properties, brutality, etcetera will arise more frequently and severely. Consequently, that can lead to the total breakdown of social cohesion and instigate

political instability. In a survey conducted by the researcher, it is also found that 96% of respondents believe, CC is a threat to food security in BD.

Figure 9: Responses on Climate-induced Food Security Threat

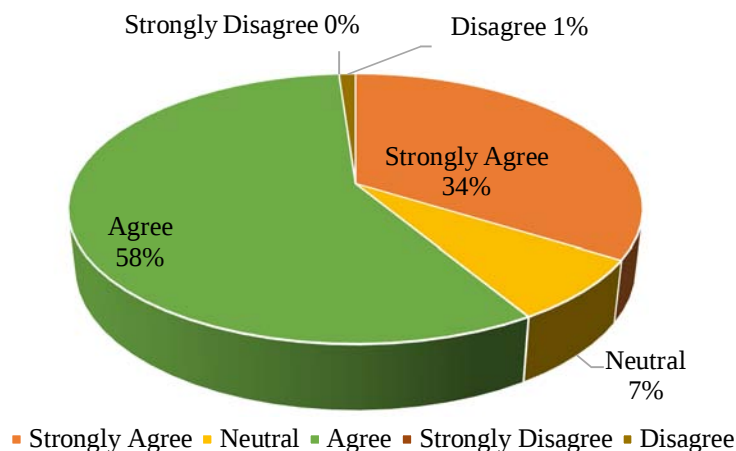


Source: Author's self-construct

Climate change will have a growing impact on climate-sensitive diseases due to various factors like water availability, air quality, pathogens, and human habitat. Higher mean temperatures will increase the effectiveness of bacteria, viruses, and other pathogens. Besides, the rise in temperature, higher humidity and suitability of mosquito breeding sites escalate malaria transmission even in higher altitudes. Evidence from the past few years demonstrates an increased risk of malaria and dengue which is a fast-growing challenge in BD.

Internal violence will be evolved mainly due to the competition for scarce resources. In many cases, it is observed that there is fierce competition for government-owned khas land which has led to violence among the local inhabitants.¹⁸ Besides, migrated people will contribute to rising crime and insecurity in their newly shifted areas.¹⁹ In a survey conducted by the researcher, 92% of responders believe that, due to the CC, internal violence can affect the security of BD.

Figure 10: Responses on Climate-induced Violence



Source: Author's self-construct

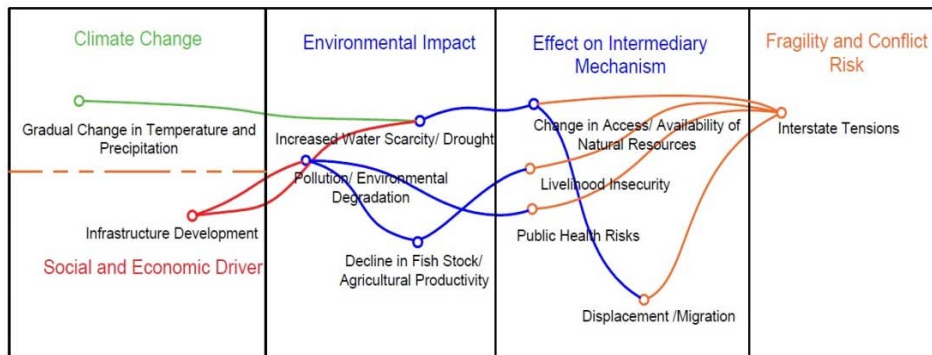
CC-induced disasters can cause an unexpected loss of land and lives and destruction of means of livelihood. In the immediate aftermath of this kind of disaster, internal displacement is very likely to occur which can give space for traffickers to operate and exploit affected people. This may lead to a sharp rise in human trafficking. Field research conducted in BD after Cyclone Sidr in 2007 demonstrated an increased rate of trafficking in affected districts.²⁰

Terrorism is interrelated with the socio-economic and political situation of a country. Due to the CC, though there is less chance of armed conflict within the state, we cannot ignore the vulnerability of recruiting marginalized people by the different armed groups. These poor and underprivileged people are highly prone to be inducted by the local gangs and engage in illegal activities.²¹

Traditional Security Threat

Traditional security concerns are about threats against the essential values of the state, political sovereignty, and territorial integrity.²² Due to the CC, BD may face following traditional threats, if not in near future maybe in the long run.

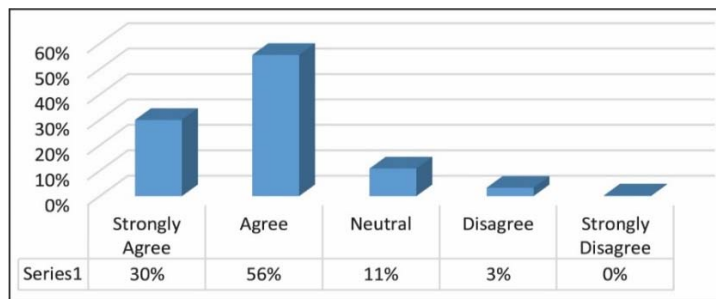
Climatic variabilities like more frequent dry spells and flooding, more erratic rainfall patterns, and variability in precipitation levels can play a major role in interstate conflict. Figure 11 shows a conceptual framework of how CC can escalate inter-state tension in the long run.

Figure 11: CC and Inter-state Conflict

Source: Author's self-construct

Bangladesh shares its boundary with two neighbouring countries- India and Myanmar. Most importantly, BD shares water of common rivers like Ganga, Brahmaputra, Meghna and Tista. The construction of the Farakka Barrage by India along the Ganges has created water tension in BD by exacerbating the dry season and increasing the likelihood of flooding in the wet season. For a state, this is very challenging because water is a resource that neither of the states can survive without. This resource naturally has overwhelming consequences for the lower riparian state like BD that can create an atmosphere of mistrust and insecurity between the neighbours.

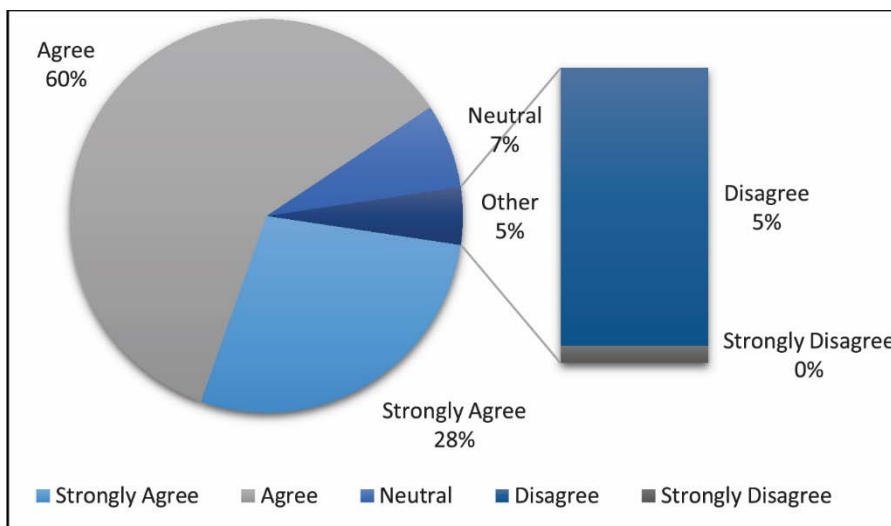
In some cases, climate-induced NTST can turn into a traditional security threat.²³ Once large-scale climate refugees will be generated, many of them will try to migrate by crossing through the border. The most common destination will be the neighbouring countries, and such migration could become a very sensitive issue in diplomatic relations between the two countries and has the potential to contribute to regional instability. In a survey conducted by the researcher, it is found that 86% of respondents believe that CC can escalate border tension on the issue of large-scale migration.

Figure 12: Responses on Climate-induced Border Tension Due to Large-scale Migration

Source: Author's self-construct

CC may significantly reduce military capability in terms of assets and training. Military installations like cantonments, and air and naval bases can suffer huge destruction due to higher-category cyclones or tornados. In addition, extreme weather events will reduce the effectiveness of military training and add additional load to their duties. For example, due to the recent flood in June 2022, the 17 and 19 Divisions of the BD army were engaged in disaster management instead of conducting summer training. Prolonged engagement in such duties will reduce the efficiency of what the military is primarily tasked with. In a survey conducted by the researcher, it is found that 88% of respondents believe, CC can reduce the military capability of BD significantly.

Figure 13: Responses on Reduction of Military Capability Due to CC



Source: Author's self-construct

Measures to Combat Climate-Induced Security Challenges

Addressing CC issues has become the national priority for BD. Despite the considerable progress, we face continuous challenges associated with CC. When it comes to tackling the adverse effects of CC, there are mainly two types of measures: mitigation and adaptation.

Mitigation Measures: Mitigation measures are those actions that are taken for tackling the causes to minimize the impact of CC. Mitigation, therefore, attends to reduce and curb greenhouse gas emissions.

One of the methods to mitigate the consequences of CC is to switch to renewable energy and reduce dependency on fossil fuels. By incorporating biofuels, wind, and solar, the emission of greenhouse gases can be drastically reduced. In terms of total

carbon dioxide emissions, developed countries and big emerging economies are in the lead. To reduce the emission of these heat-trapping gases, vulnerable countries like BD need to raise their voice on the global platform. Industrial ecology (IE) is a process like a man-made ecosystem that functions the same way as natural ecosystems do, where the waste or by-products of one operation are used as inputs for another. This means that in addition to final output, if a manufacturing plant generates by-products or waste, such by-products and waste must be managed and reused by other units to avoid or decrease the amount of pollution. The final goal of IE is to achieve cleaner production for long-term solutions. 'Carbon pricing' is a market-based approach to reduce greenhouse gas emissions. The goal is to put a monetary value on carbon emissions so that the costs of climate consequences guide the production of low-carbon energy solutions. The market then acts as an effective means of reducing emissions, promoting clean energy and low-carbon technology innovation.

Adaptation Measures: Adaptation measures are those measures which are taken to reduce vulnerability to the effects of CC. To become more adaptive to the consequences of CC, several actions can be taken which are as follows:

As part of the adaptation measures, constructing and strengthening river embankments and coastal polders, building emergency cyclone shelters and resilient homes, and increasing the capacity of government agencies to respond to disasters are the priority actions that need to be ensured. Forests play a key role in our survival as they leave oxygen and in return absorb harmful greenhouse gases like carbon dioxide. So, it is very important to expand our forests and as well as restore our landscape from a degraded state. To reduce the vulnerability in agriculture, diversified cultivation like flood and drought-tolerant crops need to be cultured. With the advancement of technologies, the hydroponic system of agriculture is becoming popular due to the low requirement of space with a high yield of crops. Our local people need to be habituated to the process of the modern system of cultivation. Investing in the field of Research and Development (R&D) for BD is another prime requirement for adaptation with the effect of CC.²⁴ There was speculation that one-third area of BD will go underwater by 2015 due to the CC, which is not a fact. Therefore, it is very important to conduct experimental research about the correct pattern of temperature and sea-level rise. As CC is a global issue, it is not possible to combat this threat merely by taking action within the country. A functional institution, at least within SAARC countries under a regional cooperation framework, needs to be built up for a long-term solution.²⁵ Common river water cooperation framework has become essential for solving the transboundary water issue.

Conclusion

There is no denying the fact that the changing scenario, caused by climatic conditions, will lead a huge number of people to be distressed and migrated. This forced migration will create an impact on individuals which may lead to different forms of

criminal activity. They are more likely to push the country's internal peace into disorder and jeopardize social and political stability.

It is identified that now people are experiencing hotter days, excessive rainfall, abrupt seasonal variation, excess river and coastal erosion, salinity intrusion, excess flood and droughts compared to the previous decades. These environmental changes lead to the crisis in the field of water resources, agriculture, human health, infrastructure development and coastal management. The security aspects that are directly interlinked with the effect of CC have two major branches. Firstly, NTST refers to factors other than military such as food, health and social security, internal violence, human trafficking and drug proliferation, terrorism, and illegal activities. Secondly, traditional security threats like the possibility of inter-state conflict, border tension and reduction of own military capability are interweaved with the adverse climatic effects. Two types of measures can be taken to minimize the effects of CC on the nation. Firstly, the mitigation measures that can be taken from a global perspective to address the root causes of greenhouse emissions such as the use of renewable energy, promoting ecological industry and imposing a carbon tax. Secondly, there are engineering way-outs to be more adaptive and resilient from a local perspective against the effects of CC, such as infrastructure development, reforestation, diverse cultivation, and own research and development.

Recommendations

Based on the findings of this research, the following recommendations are made to address the issues of CC and to minimize the foreseeable adverse effects on national security:

The Ministry of Defence should be involved in all strategic and action plans against climate-induced challenges so that all foreseeable security issues can be addressed. In addition, the capacity of the armed forces should be enhanced in terms of training and modern equipment so that disasters can be well managed during a moment of crisis.

Public awareness should be promoted to make responsible every citizen of the country to address the issue of CC and its effects on national security. The Ministry of Environment and Forest should lead such a campaign in BD for the whole nation.

The government should give utmost importance to establishing a regional framework convention for common river water issues. Accordingly, a talk should be initiated with all nations of the South Asian region and act accordingly to establish an institutional framework.

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Brief Biography



Lieutenant Colonel Hamidul Islam, psc, Engineers was commissioned from Bangladesh Military Academy (BMA) with 29 BMA Special Course in the Corps of Engineers on 18 June 2008. He is a graduate of the Bangladesh University of Engineering and Technology in Civil Engineering and completed a Master's in science from the Military Institute of Science and Technology in the field of structural engineering. He contributed as the lead author to a scholarly article on textile-reinforced concrete, published in the International Journal of Protective Structure. He served in 6 Engineer Battalion and 17 Engineer Construction Battalion in different appointments. As part of extra regimental employment, he served as General Manager (Development) of the Army Officers Housing Project- Jolshiri Abashon. He participated in United Nations Peacekeeping Mission in Liberia (UNMIL) as a contingent member and in South Sudan (UNMISS) as Staff Officer. Presently, he is serving as the Commanding Officer of 18 Engineer Battalion.

Gray Zone: A Significant Mode of War in the Contemporary Spectrum of Conflict

Lieutenant Colonel Md Wadud Ullah Chowdhury, psc, Infantry

Abstract

The Gray Zone conflict is a metaphorical state of being between war and peace, where an aggressor's objective is to make either political or territorial gains or both, without crossing the threshold of open warfare with a powerful adversary. This conflict is beyond the standard and diplomatic practice, it will never cross the brink of war. States, non-state actors, or proxies are generally involved in this conflict. Gray Zone conflicts build strategic gains in terms of disrupting democratic practices, nurturing and overthrowing political elites, constructing and dominating key structures, and dissuading resistance. The USA, Russia, China, and other emerging powers are continuously identifying new forms of Gray Zone conflicts to attain their strategic objectives without any formal war against their adversaries. Developing countries are also employing a range of specific options like military, diplomatic, informational, economic, etcetera, in response to Gray Zone actions.

Introduction

Military strategy is the integration of various steps to attain a decisive objective within a specific period. Evaluating the assorted factors like own and threat capability, situation, time, etcetera, the actor decides the foremost effective means to pursue its long-term objective through a series of modest actions. However, within the strategic culture of the present day, the height of wisdom is not fighting a decisive, costly battle brilliantly, but rather achieving the goal of avoiding the battle. During the Cold War (1946-90), deterrence theory¹ was quite popular among the world powers which could dissuade them from engaging in direct confrontation. But the focus moved to the resumption of great-power competition.² Later, the end of the Cold War and the subsequent evolution of military affairs directed the countries to increase activity for winning a war without any direct conflict. This led them to an operational situation mixed with political, economic, and security contests. Such an operational environment demanded steady attention which is the 'space' between peace and war and is termed as 'Gray Zone'.³

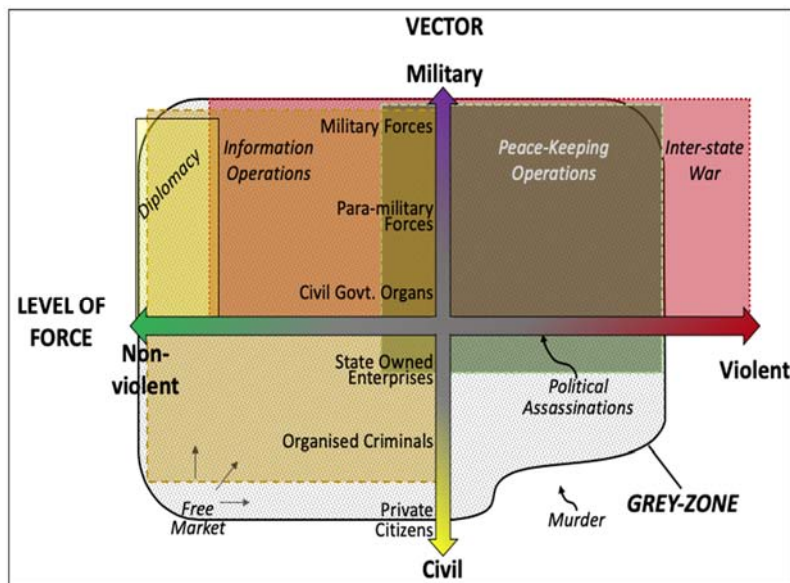
Though the Gray Zone conflict is beyond the standard and diplomatic practice, it will never cross the brink of war. States, non-state actors, or proxies are generally involved in this conflict.⁴ In recent days, this conflict typically replicates the impact of three

major trends in global politics: the restricted however still transformative intentions of measured revisionists; the dependence on progressive ways to revise components of the system; and thus, the utilization of untraditional tools of diplomacy to achieve the decisive gradual objectives within the no man's land between peace and war.⁵ Countries like the United States, Russia, China, etcetera, are the key actors operating within the current Gray Zone environment in the world.⁶

Defining Gray Zone Conflict

The terminology 'Gray Zone Conflict' is relatively new in the military lexicon which is related to the conflict environment in the irregular warfare paradigm.⁶ Gray Zone is the obscure theoretical area between war and peace.⁷ Invaders utilize ambiguity and leverage of non-attribution to attain strategic objectives by restricting counteractions by different countries.⁸ Gray Zone conflict is a set of coercive activities happening within the space of neither peace nor war. Within this strategy, an actor or revisionist will avoid crossing the line that leads to war.⁹ Gray Zone conflict may also be defined as measured aggression employed by states dissatisfied with the established order and determined to revise important aspects of it while staying below thresholds that may generate a robust global response.¹⁰ Gray Zone conflicts will always remain below the threshold of war with its implication to remain constrained.¹¹

Figure-1: The Gray Zone in the Context of Statecraft

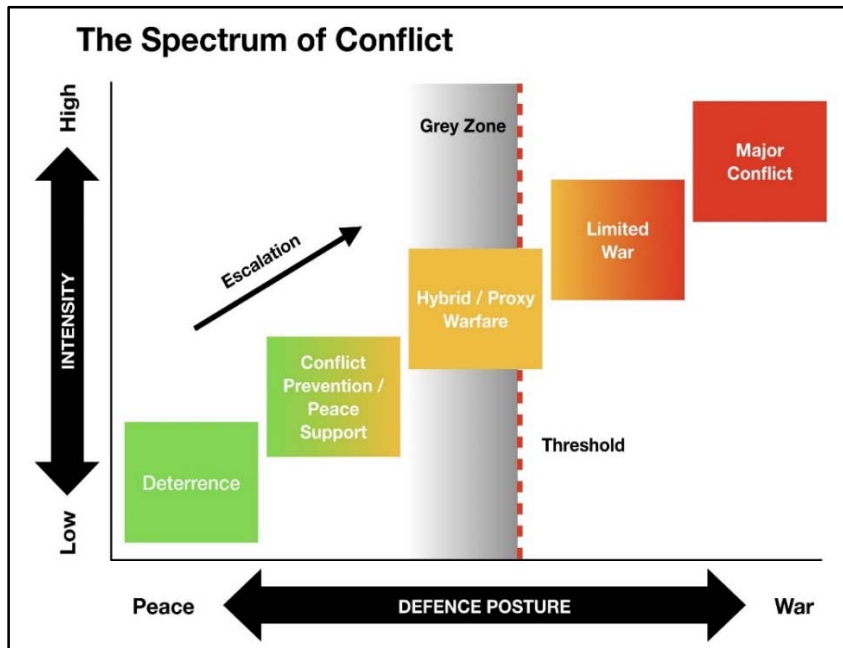


Source: Thomas Dobbs, 'Gray-Zone Activities and the ADF'¹²

Gray Zone: A Significant Mode of War in the Contemporary Spectrum of Conflict

The Gray Zone strategy may employ a variety of means like the use of proxies, covert military operations, and paramilitary activities in the land, air, sea, cyber, and space.¹³ The spectrum of conflict is comprised of a range of activities including peace, war, and Gray Zone operations where the 'Gray Zone is in between peace and war'.¹⁴

Figure-2: Gray Zone in the Spectrum of Conflict



Source: Nicholas Drummond, 'The Spectrum of Conflict'¹⁵

Difference between Hybrid Conflict and Gray Zone Conflict

The concepts of Gray Zone and hybrid strategies are different from each other.¹⁶ Generally, the hybrid concept combines military tactics in both conventional and unconventional divisions. But the Gray Zone strategy does not resort to directly using sizeable force. A part of hybrid tactics could be employed within the Gray Zone approach, but it almost certainly never uses direct conventional means. Thus, the Gray Zone strategy could be said as a subcategory of the hybrid strategy, not the other way around.¹⁷ Gray Zone tactics do not cross the line of formal state-level hostility.¹⁸ Gray Zone, asymmetric, and hybrid warfare are the terms that delegate with the facet of strategy that concerns how the state employs ways and means to attain national security policy objectives. Means are the diplomatic, informational, military, and economic elements of national power; ways to explain how these means are utilized to accomplish the ends of strategy. The ideas of the Gray Zone, asymmetric, and hybrid are thus discussed as the 'ways of war.'¹⁹

Figure-3: Difference between Gray Zone Conflict and Hybrid Warfare

Characteristics	Gray Zone Conflict	Hybrid Warfare
Level	Tactical, Operational, Strategic	Tactical and Operational
Use of Conventional Military Operations	Used alongside non-conventional operations	Used alongside non-conventional operations. Usually, the dominate element
Use of Non-Conventional Military Operations	May be used standalone or alongside conventional operations	Used alongside conventional operations as auxiliary tactics
Protracted Engagement	One of the dominant characteristics	May be protracted or short
Global or Regional Revisionist Ambitions	One of the dominant characteristics	Out of scope as the concept pertains to operational and tactical levels
Symmetry between Opponents	Used under both symmetric and asymmetric conditions	Largely used under asymmetric conditions

Source: Author's self-construct²⁰

Characteristics of Gray Zone Conflict

Certain characteristics of Gray Zone conflicts are similar in every corner of the world. But states may add or exclude a few actions based on the situation, own and threat capabilities, objectives, and other peripheral issues. General characteristics of Gray Zone conflict are explained in subsequent paragraphs.

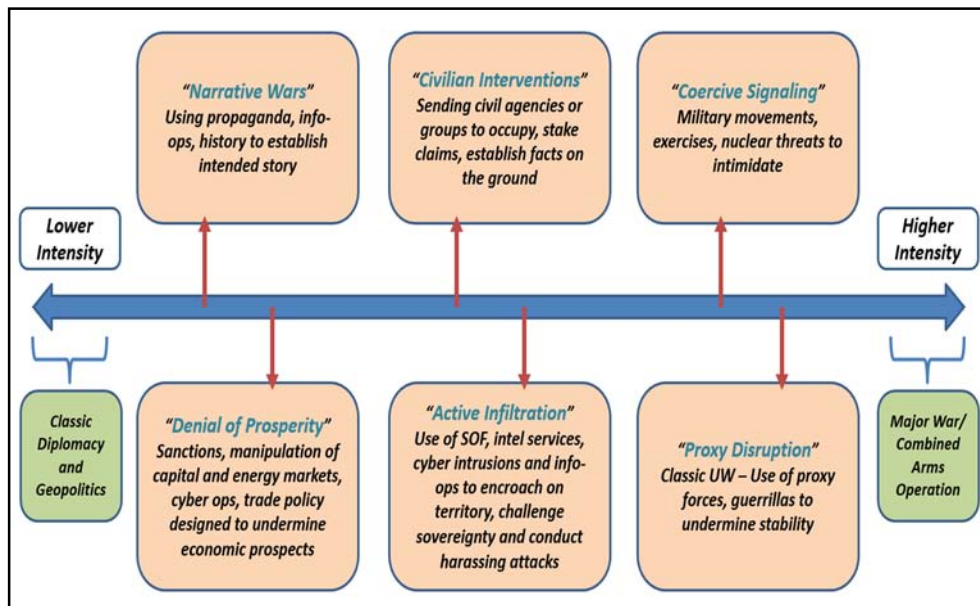
Gray Zone conflicts will always be planned to achieve strategic aims. A deliberate and integrated plan of all related activities in the Gray Zone is made and implemented by the aggressor to achieve strategic gains.²¹ Effective and timely use of all related resources of the aggressor will ensure the success of the campaign in the boundaryless Gray Zone to achieve strategic aims overruling the counter-Gray Zone campaign by the target country.

Ambiguity is an essential part of Gray Zone conflicts to remain within peace and war. Ambiguity is maintained by the aggressors by using proxies like criminal networks, militias, special operation forces, and intelligence operatives and by using civilians to achieve objectives through non-violent means. Thereby, the aggressor can attain its

Gray Zone: A Significant Mode of War in the Contemporary Spectrum of Conflict

objectives by minimizing diplomatic, military, and economic consequences. If ambiguity is not maintained throughout the Gray Zone operations, the aggressor is likely to be open to conflict escalation, conventional conflict, economic and military sanctions, and other negative diplomatic and economic actions by the international community.²²

Figure-4: A Spectrum of Gray Zone Techniques



Source: Michael J. Mazarr, *Mastering Gray Zone: Understanding Changing Era of Conflict*²³

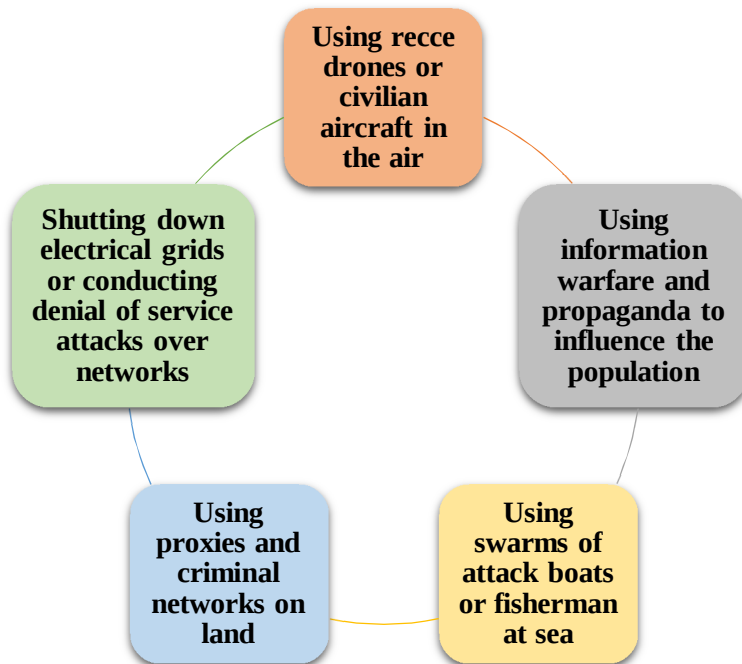
Various activities in the Gray Zone involve actions in which the aggressor disguises its role. The aggressor deflects responses and obstructs the potential for successful deterrence by denying the responsibility during cyber-attacks, disinformation campaigns, or proxy forces.²⁴

Gray Zone campaigns are fluid. Personnel from different sectors may act within their own domains or they may also act inside others' domains for achieving the best output.²⁵ Thereby, the scope of working beyond the physical boundaries is more in the Gray Zone activities. The country exercising the Gray Zone activities may not have overwhelming superiority in terms of resources in any of the non-military areas like soft power or diplomatic power. Thereby, effective use of the maximum possible resources of the nation along the boundary-less Gray Zone area is likely to ensure the best effect.²⁶ The invader adopts a comprehensive method to exploit the limitations of its adversary using elements of national power like diplomatic, information, military,

and economic (DIME). The use of a nation's all instruments of power is an effective tactic against large and democratic countries.²⁷

The correlation between the deception plan or Gray Zone conflict plan and conventional operational plan is always integrated well before. If the Gray Zone conflict goals are achieved as per plan that will complement the overall strategic plan.²⁸ Failure or success of the boundaryless deception plan in the Gray Zone will have a significant impact on the ultimate broad plan of the aggressor. Aggressors can use hybrid threats in all domains of warfare like land, sea, air, cyber, and information to attain the objectives within the Gray Zone. Aggressors will conduct a thoughtful assessment of each operational environment and determine where they can attain the most effective influence in the Gray Zone.²⁹

Figure-5: Examples of Operations in Various Domains³⁰



Source: Author's self-construct

Avoidance of war is one of the key points of the plan for Gray Zone activities. In any case, activities that may escalate the war are avoided. The integration of risk and utilization of force is directly controlled by the centre.³¹ This risk management is important to achieve the objective of the Gray Zone conflict without any kind of war. Various activities within the Gray Zone may be stretched over years and make

deterrent threats ambiguous. The aggressor country avoids bold and quick activities in the Gray Zone to achieve strategic gains.³²

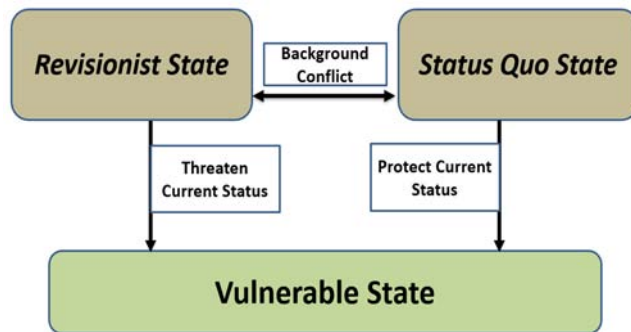
Figure-6: Probable Core Elements of Gray Zone Conflicts³³



Source: Author's self-construct

Causes of Gray Zone Conflict: Many countries mostly the global powers are continuously doing research and identifying new forms of Gray Zone conflicts in recent days. Generally, states adopt this strategy for various reasons which are briefly explained in the following paragraphs.

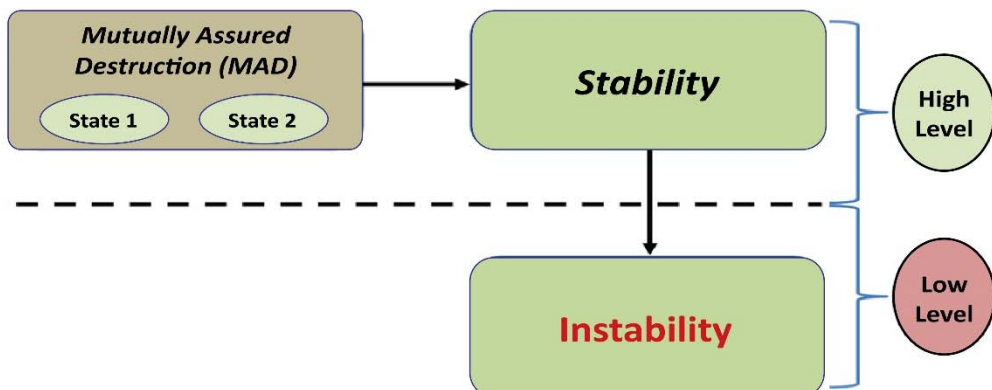
An aspiring challenger state is likely to take some attempts to change the status quo if it is not fulfilled with the components of the existing system. When a country develops faster than its neighbouring countries, the distribution of benefits may not reflect the distribution of power which provides the growing country with an advantage to challenge the status quo. In this scenario, the growing country is defined as revisionist which often rises even after the stable establishment of global order and allocation of benefits. If the leaders of a country perceive that their state is more powerful than it is in reality, then the possibility of changing the status quo is more which ultimately leads the country to Gray Zone coercion.³⁴

Figure-7: Basic Set of Actors and Interactions in Gray Zone Conflicts

Source: Asmeret Naugle and Michael Bernard, *Proxy War in the Gray Zone*³⁵

Generally, the nation that can exploit its geopolitical influence to reshape the global system in its favour is termed as a dominant power. A dominant country retains a large and highly proficient military and also maintains a powerful alliance of allies and partner countries around the world. Thereby, a dissatisfied aggressor country simply cannot overturn the status quo through war, due to the presence of a capable dominant power. That is why, aggressor countries lacking the capability to gain their objectives through conventional ways prefer to erode global order through Gray Zone campaigns.³⁶

An escalation dominance within the planning of military dominance provokes contestants to realize additional limited changes to the status quo rather than direct military challenges to that. This is called the stability-instability paradox.³⁷ For instance, if a state identifies that its adversary has escalation dominance up to a certain domain, it is obvious for this state to avoid escalation to that domain. So, a dissatisfied country may challenge limited components of the regional orders by adopting Gray Zone tactics.

Figure-8: Theoretical Framework of Stability-Instability Paradox

Source: Kenneth Waltz, *For Better: Nuclear Weapons Preserve and Imperfect Peace*³⁸

Lines of Strategic Actions: Different lines of strategic actions are used in the Gray Zone by various aggressors. These actions will not be similar for every Gray Zone or every aggressor.³⁹ These may be modified or changed based on the success of other actions or plans of the aggressor.⁴⁰ Different lines of strategic actions are appended in the subsequent paragraphs.

Domestic political disruption of the opponent is likely to provide a competitive advantage to the aggressor. Assistance for anti-establishment actors in internal politics is likely to upset the decision-making process of the adversary.⁴¹ Support for these actors is ensured by using various direct or indirect channels to heighten existing divisions and erode the legitimacy of political institutions. Influence operations are closely associated with political disruption as well. Preparation and propagation of metanarratives to influence the political processes of different countries to favour the interests of initiators of the Gray Zone operations and delegitimize the adversary's establishments are the core components of influence operations. The application of conspiracy theories also falls under the influence of operation.⁴²

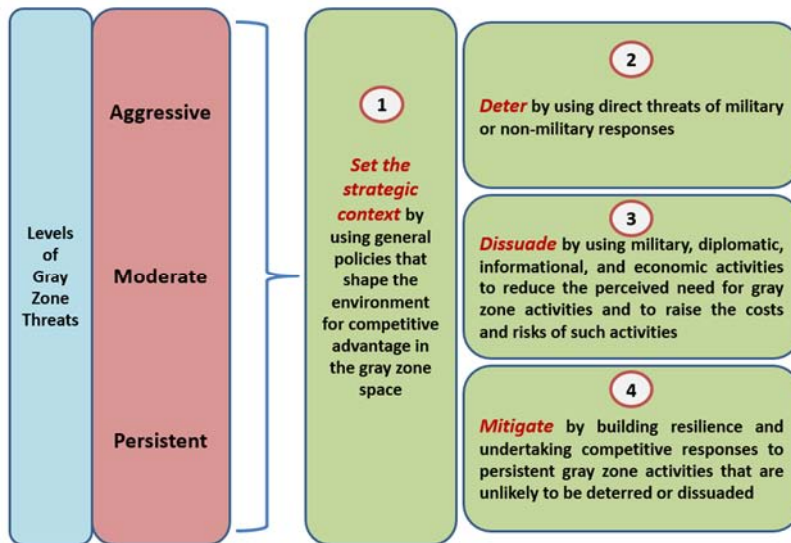
Cyberattacks are very common forms of strategic actions by the aggressor. Cyberattacks on the state and non-public organizations of the opponent threaten and generate confusion in the constitutional decision-making cycle.⁴³ This also exposes the weaknesses of the opponent. Cyberattacks may consist of denial of access to institutional websites, economic cyber-espionage, blocking the economic flow online, etcetera. Commercial and financial practices which create political pressure on the opponent country are the element of economic coercion. Legitimate decisions related to buying or sale of specific products, economic sanctions, or blockades are the common steps taken by the aggressor in economic coercion.⁴⁴

When the threat of the use of force includes both coercion and deterrence, they become complementary. This ambiguity is proved to be effective in Gray Zone conflict. The most common examples of these actions are the demonstration of military capabilities for internal and external consumption, deliberate military/manoeuvre exercises or drills near the shared border, well-publicized testing of the new weapon systems and frequent air or sea space violations, etcetera. Proxy wars are quite common and old lines of strategic actions in Gray Zone conflict. Proxy wars take place in the Gray Zone, due to the absence of direct combat between the aggressor and the opponent. A few common forms of proxy wars are providing economic assistance, employing military forces as non-combatant assessors, utilizing their forces as volunteers or under fake nationalities, etcetera.

Responding to Gray Zone Threats: Response to various activities of Gray Zone threats depends on various factors like military capabilities, economic power, internal

political issues, leadership confidence, the response of alliance, global response, geopolitical situation, etcetera. This response will not be similar for all states. A range of specific options like military, diplomatic, informational, economic, etcetera, may be employed in response to Gray Zone actions. However, a likely framework for responding to Gray Zone threats is shown in the following figure.

Figure-9: Strategic Concept for Responding to Gray Zone Threats



Source: Lyle J. Morris, et al, *Gaining Competitive Advantage in the Gray Zone*⁴⁵

Conclusion

Gray Zone conflicts are part of the competitive operating environment that developed in the post-Cold War era. The gradual and ambiguous nature of Gray Zone conflicts demands a clear understanding of aggression short of conventional war. The term Gray Zone conflict is a descendant of 'political warfare'. Gray Zone conflicts build strategic gains in terms of disrupting democratic practices, nurturing and overthrowing political elites, constructing and dominating key structures, and dissuading resistance. Coordinated usage of strategic lines of action coupled with numerous levels of escalation offers the upper hand to an aggressor.⁴⁶ This aggressor may resort to the Gray Zone over a foe whose defensive strategy is centred on classic military deterrence rather than on the obscurity of the Gray Zone conflict.

However, Gray Zone conflict has got the risk when it may end up generating reactions by the target country which may weaken the military, political, and economic position of the aggressor country. In some cases, strategic gains attained through ambiguity may lead the aggressor to make a wrong perception about the seriousness of the target

country's red lines and the credibility of its deterrence.⁴⁷ The strategic culture of the state, structural design, Gray Zone detection, ethical dilemmas, and legal constraints are the most significant challenges for operating within the Gray Zone. The organizational strategy of a few nations may find it complicated to deal with the multidimensional challenges which are simultaneously political and military in nature.⁴⁸ Policymakers of a few countries may also consider legal framework and international laws while planning for the options in the Gray Zone which makes it challenging for them to plan for various Gray Zone activities.⁴⁹

Notes and References

1. Deterrence is about preventing war. It is not a long-term solution to a hostile security environment but takes a threat-based approach to convince opposing states that aggressive action is not in their best interest. Deterrence can be conceptualized in a few ways: the first is by deterring states through denial or punishment. Deterrence by denial occurs when a state has robust capabilities that an enemy attack would not be able to overcome or that the impact of the attack would be significantly diminished or delayed. Deterrence by punishment occurs when an aggressor state chooses not to attack because they believe that even if they achieve its objective, it would be subject to punishment such as sanctions or a counterattack that would be more costly than what was gained from the initial attack.
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Brief Biography



Lieutenant Colonel Md Wadud Ullah Chowdhury, psc, Infantry was commissioned in 2004. He is a graduate of DSCSC, Mirpur and Army Command College, Nanjing, China. He also attended Junior Command Course at Army War College, MHOW, India. Lieutenant Colonel Wadud completed Master's in Military Studies from Bangladesh and Master's in Military Command from China. He commanded a Mechanized Infantry Battalion. He also served as Platoon Commander at Bangladesh Military Academy and as Scenario Developer at Army War Game Center. Lieutenant Colonel Wadud served under blue helmet as contingent member in United Nations Mission in Sudan (UNMIS) and as Military Observer in United Nations Mission in South Sudan (UNMISS). Presently, he is serving as General Staff Officer-1 in DGFI.

The Evolution of Non-Kinetic Threats from Non-State Actors vis-à-vis Armed Forces Integration for Effective Targeting

Commander S M Abdullah Woise, (ND), psc, BN

Abstract

This paper examines the evolution of non-kinetic threats from non-state actors and the requirement of integrating armed forces with non-military security tools to target these threats effectively. It examines the role of non-state actors in the security environment and their use of non-kinetic threats such as cyberattacks, information operations, bioterrorism, forced displacement, nuclear theft, economic coercion and decentralised action. The paper also looks at the effectiveness of integrating armed forces to counter these threats. It discusses the importance of developing an effective strategy to target non-kinetic threats from non-state actors, considering the various challenges posed by such threats. It also proposes a framework for effectively integrating armed forces to target these threats. The paper concludes by stressing the importance of coordinating efforts among the armed forces and different security actors and a pragmatic national security structure to counter non-kinetic threats from non-state actors effectively.

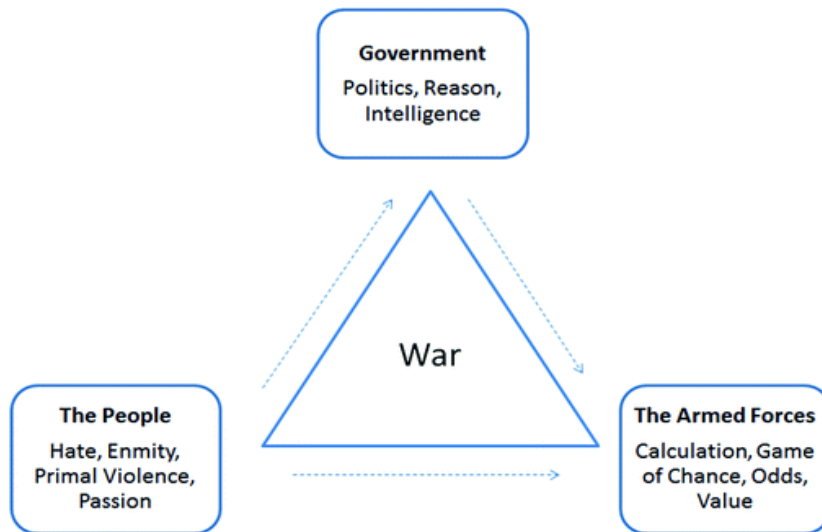
Introduction

Over the last two decades, conventional forces are countering threats that are hardly distinguishable, involving civilians and increasingly becoming non-kinetic. Moreover, the advent of technology, access to information, and state-sponsored terrorism have leveraged non-kinetic threats by the non-state actor (NSA). Recently, non-kinetic acts by NSAs have intensified in cyberattacks, information operations (IO), bioterrorism, forced displacement, nuclear theft, economic coercion and decentralised action. Today, all militaries are reconsidering how to counter such an enemy who is likely to operate from shadow. For example, the US Army/Marine Corps counterinsurgency (COIN) manual reflects the need for unity of effort between the military and academic worlds.¹ However, the conventional armed forces still focus on and prepare to counter a traditional force. As a result, the integration of the armed forces does not emphasise countering non-kinetic threats from NSAs. Evidently, there is a lack of adequate study, preparedness and even understanding of non-kinetic threats from NSAs that require military intervention. In this paper, an effort will be made to outline the framework of integration within armed forces and other agencies of a state to effectively target non-kinetic threats.

Evolution of Non-Kinetic Threats

Carl von Clausewitz (1780-1831) assumed that warfare is inherently a socio-political phenomenon. He conceptualised warfare based on political and social relationships between three interconnected actors, which form a trinity. The people, government and armed forces are tied in this trinity to deliver security. These actors are also intricately linked to warfare.

Figure-1: Clausewitz's Trinity of War



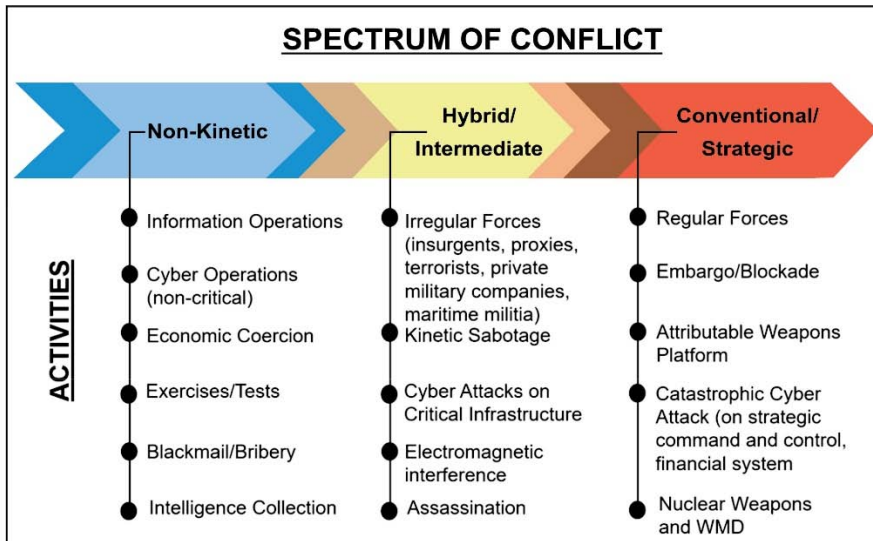
Source: Gordan Akrap and Pavle Kalinić, 'Forced Migrations – Powerful Non-Kinetic Weapon,' *National Security and the Future* Vol 16, Issue 23, 2015, pp.10–28.

The Clausewitzian war will not disappear soon because of rising tensions between great powers (United States, Russia, and China). However, violence for strategic purposes is no longer a prerogative of states only. Access to technologies will contribute more to easy access to coercion to NSAs. Such neo-trinitarian war will enable states and non-state actors who will be able to wage kinetic and non-kinetic violence.

One of the characteristics of emerging technologies is that they proliferate very quickly. For example, once a digital code is released, there is no quick way to stop it from mass access. This proliferation is horizontal (across states) and vertical (from states to NSAs). Consequently, non-state groups can access new technologies and potentially become international security actors with a strategic impact.² Due to the technological evolution, NSAs such as Non-government Organisations (NGOs), religious groups, and technology-based firms will find resources and global reach to

build alternative networks that complement, compete with, or possibly bypass states. Several states have taken steps to regulate or break up such influential platforms realising the threat. Consequently, many NSAs will likely push back on state efforts to consolidate autonomy. On the other hand, technologies like hypersonic and artificial intelligence (AI) can create new weapons that may increase the motivations for states and their armed forces to establish supremacy at each level of the spectrum of conflict including targeting the NSA.³

Figure-2: Spectrum of Conflict and Use of Force by State



Source: Author's self-construct

Non-Kinetic Threats Emanating from Non-State Actors

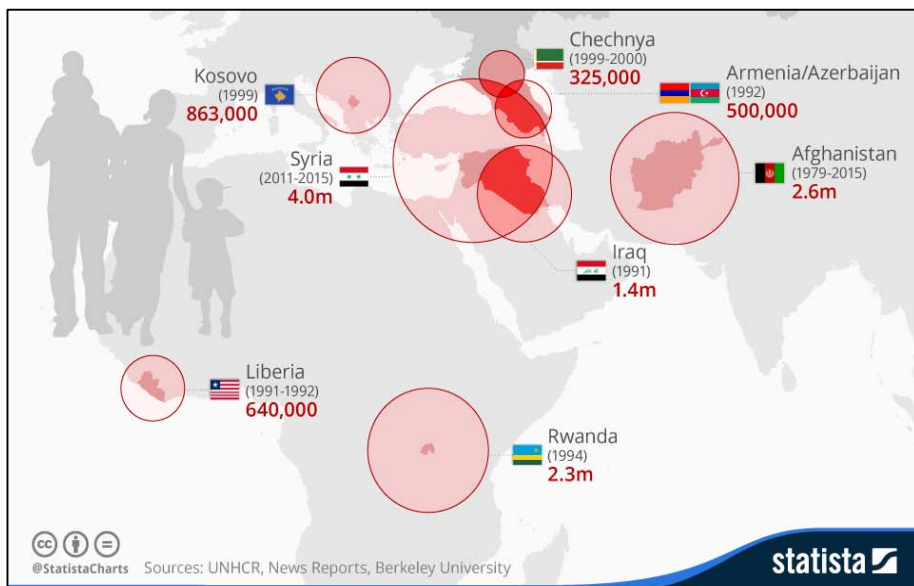
Since the 1970s, international terrorist organisations have consistently used the information domain to further their objectives. Social media has provided such organisations with greater control over their messaging—for example, Islamic State of Iraq and Syria (ISIS)'s use of social media for propaganda, recruiting, and amplifying its kinetic activities. Presently, NSAs can exploit a wider population through an information campaign. As a result, the information domain has become a potent weapon against state actors.

Cyberattacks can target areas society otherwise takes for granted, such as financial systems, energy, food security, and power supply. NSAs can target states into disarray and even cause physical danger by targeting essential services. Recently, in the US such vulnerabilities made headline news, such as the 'Solar Winds Hack' and the 'Colonial Pipeline Ransomware Attack.' NSAs are likely to emphasise loose

affiliations and coordination to conduct international terrorism. Their capabilities to communicate, recruit, and coordinate are leveraged by social media and the dark web. There are also increasing signs of a “privateer” construct, in which small terrorist organisations are hired for non-kinetic actions (NKAs) by a nation-state for deniable action.

Counterterrorism experts have long been familiar with ‘hawala’ networks for economic coercion by the NSAs. The network facilitates traditional, small-scale international finance and unique benefits to those who want to avoid detection. Similarly, the increased use of blockchains and cryptocurrency offers terrorist opportunities through inconsistent global regulation. In the 21st century, many nation-states are countering the threat of a wave of unregulated entry of foreign personnel due to forced migration by states and NSAs. One relevant example is the Syrian refugee crisis in European Union (EU). The migrants from Syria often include members of ISIS and try to create a state of emergency by recruiting future terrorists and perpetrators.

Figure-3: Statistics of Forced Migration since 1991



Source: UNHCR, *News Reports*, Berkeley University

Since 1963, eighty attacks by NSAs on nuclear facilities have been recorded around the globe. For example, South Asia Strategic Stability Institute (SASSI) reported eighteen nuclear material theft incidents in India from 1994 to 2021 involving over 200kg of nuclear material.⁴ Such incidents are a matter of deep concern. United Nations Security Council Resolution 1540 and the International Atomic Energy Agency (IAEA) Convention on the Physical Protection of Nuclear Material (CPPNM) made it binding on

states to ensure nuclear material security from falling into the wrong hands. Despite protection measures, the involvement of NSAs in nuclear theft indicates a severe risk to global nuclear safety.

Recently, biological agents have garnered attention from international terrorist organisations due to their effectiveness and relative affordability as weapons. Considering the global disruption caused by the COVID-19 pandemic, it is understandable that terrorist organisations will focus more on this area. A terrorist organisation can create havoc using biological agents while remaining physically distant, dispersed, and entirely opportunistic.

Armed Forces in Countering the Non-Kinetic Threats

Traditionally, most world militaries train for World War II and Cold War scenarios. They focus on large force-on-force operations facing an enemy with similar capabilities. As the threat has evolved in the non-kinetic domain, the armed forces need to change direction too. Realising the fact, several advanced militaries have taken some recourses.

In October 2014, the US established Combined Joint Task Force and conducted Operation Inherent Resolve (CJTF-OIR) against the ISIS. CJTF-OIR and coalition partners pursued ISIS using air and ground forces, along with local troops and opposition groups.⁵ Special Operation Forces (SOF) conducted counterterrorism (CT) operations in this mission. However, the coalition forces later pursued a much different type of warfare for intended success against ISIS's NKA. ISIS effectively used the internet to recruit, radicalise, threaten, and intimidate. The group also used the internet for global reach—which CJTF-OIR could not disrupt solely using air or ground forces. Subsequently, separately formed Joint Task Force (JTF) ARES started Operation Glowing Symphony (OGS). OGS objectives against ISIS cyber activity included effects against network services and applications, social media, email, domains, virtual private servers, media products, and webpages.⁶

Presently, US armed forces emphasise the cohesion of action and purpose among their elements for developing non-kinetic capabilities.⁷ Further, the US has developed doctrine, organisation, training, and equipment considering Civil Affairs (CA) in operation against NKA. These are briefly highlighted here.

The CA doctrines JP3-57 and FM3-57 describe the essential functions of CA and civil-military operations. However, it provides a limited description to utilise CA Operations for conducting special operations. One officer and three non-commissioned officers make a SOF CA team. Their employment reduces political risk to US diplomats who must authorise their presence in a country. Additionally, one member is a Special

Operations Combat Medic, providing day-to-day medical care for the team in hostile locations. The SOF CA teams are trained in survival, escape, resistance, and evasion skills, advanced off-road driving, low visibility marksmanship, social network analysis, and environment preparation. SOF CA's training and organisational aspects are supported by its specialised equipment, including concealable handguns for low visibility force protection. SOF CA mainly uses non-tactical vehicles, decreasing their "signature" as the US military. SOF CA teams also deploy small satellite internet systems, allowing access to DOD unclassified and classified networks and access to their chains of command, the intelligence community, and other US resources. Finally, the doctrine, organisation, training, and equipment create a suitable force for low-visibility operations, creating a situation where partner states and civil leaders are more willing to interact where overt military troops are not applicable.

Australia's Legislation and Policy Amendments

Recently, Australia has updated its legislation, policy and bureaucratic structure to manage foreign influence. These responses are focused on criminalising, disrupting and deterring foreign interference. Essential measures include the Espionage and Foreign Interference Bill, creating foreign influence transparency registers, and establishing the National Counter Foreign Interference Coordinator position.

India's Security Measures

India's armed forces and Information and Communications Technology (ICT) have developed ICT and media infrastructure. The armed forces have proposed setting up a Cyber Command, which is still developing.⁸ India is also establishing a broadband network for e-governance. Moreover, the government issued a Comprehensive Security Policy in 2013 which can address several non-kinetic threats. The ingredients of this policy include various functions as listed below:

- a. The Computer Emergency Response Team (CERT), whose mission is to enhance the security of India's information and communication infrastructure.
- b. The National Association of Software and Services Companies (NASSCOM) has been set up to involve the private sector in cyber security.
- c. The responsibility for offensive Cyber capability has been given to the National Technical Research Organisation (NTRO) and the Armed Forces.
- d. To protect information and communications technology infrastructure, a National Critical Information Infrastructure Protection Centre (NCIPC) is being set up as a centralised command centre.

- e. To strengthen national telecommunications security, a National Telecommunications Network Security Coordination Board (NTNSCB) has been set up.
- f. A National Cyber Coordination Centre has been established.
- g. The Armed Forces have taken steps in securing C4I2SR. Satellites, Aerostats, Unmanned Aerial Vehicles (UAV), Electronic Intelligence (ELINT) and Signals Intelligence (SIGINT) assets, P-8i long-range maritime surveillance aircraft and Indian Regional Navigation Satellites (IRNS) have ensured a reasonable degree of transparency for the Indian Armed Forces.

Limitations: Despite several actions by states and their armed forces, non-kinetic attacks continue to threaten national security. Compartmentalised action by armed forces is one of the critical obstructions to the effective targeting of NKAs. Another reason is the armed forces' lack of expertise in such operations. Several case studies of the different countries' models show that non-kinetic actions are still not part of the military doctrine. Therefore, the countermeasure and targeting against non-kinetic threats have not been operationalised. On the other hand, NKAs are mostly overt actions which always cannot be responded to using appropriate military force.

Suggested Measures for Targeting Non-Kinetic Threats

Paradoxically, doctrine and military literature do not cover targeting non-kinetic threats using non-kinetic means. However, It is an integrated part of the kinetic operation that deserves attention. Non-kinetic targeting provides opportunities to engage and affect opponents and target audiences, including neutrals and supporters. It creates fewer devastating effects by offering other means to conduct operations considering the role of non-kinetic elements like information, perception, cohesion, understanding and will.

Contemporary research and evaluations, military doctrine, and publications dedicated to military strategy and operational art offer several non-kinetic capabilities. These capabilities include:-

- a. Public affairs, civil-military operations, key-leader engagement, and military information support operations.
- b. Inform and influence activities, negotiation, political, economic, social, and other non-combat methods.
- c. Military deception, public affairs, EW activities.

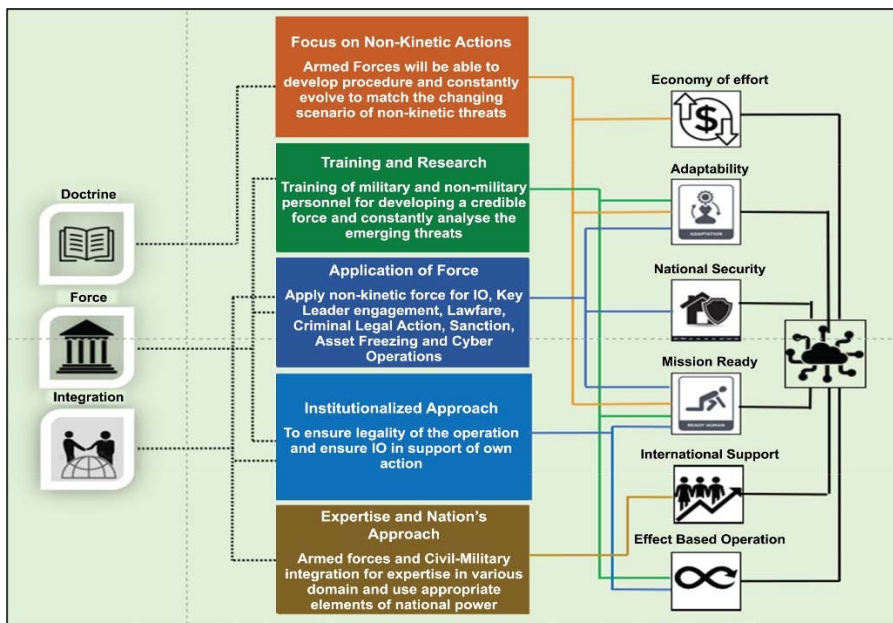
d. Presence, media, psychological operations, profile & posture, deception, Civil-Military (CIMIC).⁹

e. Political, economic, and social programs.¹⁰

Specifying these capabilities may limit its ranges by confining the concept. Instead, armed forces can prepare suitably considering perceived threats by excluding a list of capabilities. A conceptual framework for armed forces capability development (Figure 4) and general non-kinetic means and methods for the application of force are described below for stimulating thoughts:

Information Activities: The effects of information activities range from constructive (when the understanding of supporters is enhanced by providing assistance or information) to disruptive (when the target's performance is troubled due to disinformation, deception, or when public support is influenced). For example, Al-Qaeda, confronted with the counter-narratives, with half its airtime defending its legitimacy against the US operations. This total effort is attained with strategic communication, a government approach driven by interagency processes and integration of efforts to communicate national strategy effectively.

Figure-4: Conceptual Framework for Capability Development of Armed Forces



Source: Author's self-construct

Key Leader Engagement: Critical leader engagement is frequently used in stability and counterinsurgency operations. However, engaging and affecting key leaders' attitudes is

fundamental for military effectiveness in missions.¹¹ It is the planned engagements between military leadership and the leaders of NSAs. The goals could be diverse, such as stimulating a favourable attitude towards ongoing military operations, if they are supportive or not detrimental. These engagements can influence the will, perspective and understanding of the target audience at the strategic, operational, and tactical levels.

Lawfare: Lawfare is a concept introduced by Charles Dunlap (b.1950).¹² It is using the law to achieve an operational objective. Lawfare aims to create effects that serve an operational purpose. For instance, delegitimising participation in missions and operations at the strategic level or distracting leadership from the primary processes of these missions and operations. The desired effects may vary from disruptive to constructive. Armed forces may use disruptive lawfare to degrade the reputation of an opposing NSA leader or party, thereby weakening its non-kinetic capabilities.

Criminal Legal Action: Criminal legal action may be used to generate beneficial effects alongside other operations and activities. Its primary (operational) goal is to create disruptive products. It generally reduces mobility, freedom of movement, resources, and ultimately kinetic and non-kinetic power of opponents by initiating criminal procedures and enforcement powers. For example, detaining individuals and removing them from non-kinetic activity using the law. This type of targeting is also described as ‘warrant-based targeting’, ‘conviction-focused targeting’ or ‘evidence-based operations.’

Deprivation of Liberty: Outside the framework of criminal legal action, forces may deprive an individual of liberty for security reasons. The primary goal of security detention in specified circumstances is disruptive. It can prevent individuals from participating in activities that may threaten public safety, public order, or the security of (local or international) personnel of governmental organs and international forces in conflict areas. This may serve secondary goals, such as favourable public perception of the legitimacy of military operations in both host nations and back home.

Asset Freezes: Using the authority provided by appropriate bodies such as the Security Council or Host Nation institutions, operations to deprive individuals of assets can be found in the financial realm. For example, by freezing assets and resources. The primary goal is to incapacitate or control individuals by blocking or restricting their access to resources.

Cyber Operations: Military cyber operations employ cyber capabilities to attain military objectives by influencing actors in or using cyberspace. NSAs will most likely have to face disruptive effects aimed at disruption, reduction and availability of their resources, including information. Forces of imagination and skills only restrict the methods for cyber operations to use cyberspace. Cyber operations may be

elementary, such as Denial of Service, or advanced, like Stuxnet. Again, disruptive cyber operations can be repeatedly used against the same targets.

Armed forces, otherwise, may carry out these operations with kinetic actions. However, such non-kinetic targeting assists armed forces in keeping the threshold level under kinetic activities and within the framework of international law. Therefore, armed forces need specific capabilities that the conventional military otherwise does not have.

Conclusion and Recommendations

Over the last two decades, non-kinetic threats have increasingly dominated the battlefield. The armed forces' integration and readiness must evolve as roles and missions evolve to meet new situations and operational environments. Rather than making significant overhauls of existing tools, the services' policy mostly accepts new functionality by incorporating changes. Therefore, armed forces should bring significant modifications in the integration considering the non-kinetic threats.

When using various assets and actions (kinetic and non-kinetic), it is essential to harmonise and synchronise activities. In a multidimensional operation against non-kinetic threats, the need to synchronise between forces becomes even more relevant. The threat NSAs can generate is primarily non-kinetic such as cyberattacks, Information Operations (IO), bioterrorism, forced displacement, nuclear theft, economic coercion, and decentralised operations. Therefore, responses by conventional military action may become disproportionate and contradictory to the law of armed conflict against such threats.

In comparison, non-kinetic targeting, such as asset freezing may call for an additional foundation at the strategic level. The different modalities also demand the ability for the military to apply the various applicable legal regimes, for instance, criminal law, the law of armed conflict, human rights when it comes to detention, and sufficient knowledge of local administrations when cooperating with domestic authorities. Several armed forces in the world have adopted integration over jointness to counter such a threat. Cyberwar, information war, out-of-area contingencies and hybrid threats are areas wherein the integration of resources is imperative and must be handled by a domain commander.

The following points are recommended:-

First, **Specialist in Armed Forces:** Armed forces may include experts, linguists, historians, and anthropologists to understand the modes of warfare of an NSA and suggest effective measures.

Second, **Developing Integrated Capabilities:** The suggested approach is an ‘Integrated Command’ based approach where an individual desk will deal with a particular non-kinetic threat.

Third, **National Security Strategy against Non-Kinetic Threats:** The national security strategy may consider the following tools:

- a. Conflict prevention, management and termination strategy to resist the creation of NSAs.
- b. A rapid response force with the capability to reach, and operate in an information vacuum and the power to neutralise conventional to non-kinetic threats.
- c. A National Security Research Centre (NSSR) under Defence Adviser/ National Security Adviser (NSA) to assess the impending non-kinetic threats from non-state actors.

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Brief Biography



Commander S M Abdullah Woise, (ND), psc, BN joined Bangladesh Navy in the 2002-B batch and was commissioned on 01 June 2004 in the Executive Branch. He is a Navigation & Direction (ND) specialist and attended Basic Submarine Course in India. The officer underwent Air Defense Artillery Familiarization Course (ADAFc) in Artillery Center and School, Chattogram and Air Search Radar Course in Italy. He is a graduate of DSCSC, Mirpur. He has also graduated from Defense Services Staff College, Wellington, India and holds an MSc degree in Defence and Strategic Studies from Madras University. He served various ships and bases of the Bangladesh Navy in different capacities. The navigator has sailed extensively onboard naval ships in different parts of the world, including the Bay of Bengal, the South China Sea, and the East Mediterranean. As Commanding Officer, he commanded a Missile Boat and a Patrol Craft. He also served as a staff officer at BN Fleet Headquarters and Coastguard Headquarters. In 2014, he served as a UN Peacekeeper in UNIFIL, Lebanon. Presently, he is serving as the Directing Staff at DSCSC.

Feasibility of Using Scatterable Mine System as an Alternative to Anti-Personnel Mine

Brigadier General S M Anwar Hossain, afwc, psc

Abstract

Bangladesh is a signatory to Land Mine Ban Treaty which prohibits her from acquiring, stockpiling, and using anti-personnel mines. But her potential adversaries being non-signatories to this treaty are at liberty to use deadly arsenals like anti-personnel mines. This has imposed a lot of difficulties in executing the Engineer Support Plan by the Division Engineer Battalion because the absence of antipersonnel mines in their minefields would greatly reduce their ability to separate enemy infantry from armour and thereby allow enemy infantry an advantage in getting close to their location. Since 1998, Bangladesh Army has carried out several studies to find out suitable alternatives to antipersonnel mines, the outcome of which was found to be inadequate. A detailed analysis of the Land Mine Ban Treaty reveals that it allows a signatory state to use Self-destructive Scatterable Mines (SCATMINES). This mine can be dispensed remotely by suitable launchers including aerial platforms in some predesignated areas targeting an approaching enemy. This type of mine has the self-arming capability and a variable self-life ranging from a few hours to a maximum of 15 days. When the skirmish is over and the minefield is not needed anymore, mines would go for self-destruction and the area becomes open for movement again. There is no need to go through a painful recovery procedure. Bangladesh Army may explore the feasibility of this system and, if found suitable, may be allotted to the inventory of the Division Engineer Battalion to offset the disadvantage of the non-availability of conventional anti-personnel mines.

Introduction

Mines remain one of the most fearsome and versatile weapons notwithstanding the worldwide protest to ban them. Military use of mines has altered the characteristics of the battlefield for years and will continue to do so in the future. Bangladesh is a signatory to Land Mine Ban Treaty which prohibits her from acquiring, stockpiling, and using Anti-personnel mines. But our potential adversaries, being non-signatories to this treaty, are at liberty to use such deadly arsenals against us. This has imposed a lot of difficulties in executing the Engineer Support Plan by the Division Engineer Battalion, because the absence of Anti-personnel mines in their minefields would

greatly reduce their ability to separate enemy Infantry from armour and thereby allow enemy infantry advantage in getting close into their location. A detailed analysis of the Land Mine Ban Treaty reveals that it allows a signatory state to use command-detonated claymore mines against an approaching enemy.¹

Since 1998, Bangladesh Army has carried out several research to find out suitable alternatives to anti-personnel mines, the outcome of which was found to be inadequate. Self-destructive SCATMINES which can be dispensed remotely by suitable launchers including aerial platforms in some predesignated area targeting an approaching enemy may be incorporated in the inventory of the Division Engineer Battalion to offset the disadvantage of the non-availability of a conventional anti-personnel mine.² This type of mine has the self-arming capability and a variable self-life ranging from a few hours to a maximum of 15 days. When the skirmish is over and the minefield is not needed anymore, mines would go for self-destruction and the area becomes open for movement again. No need to go through a painful recovery procedure.

The paper will initially highlight the important features of the Land Mine Ban Treaty and the implications of the treaty on land operations. Subsequently, an effort will be made to orient different features of the SCATMINE system and examine its suitability as an alternative to the anti-personnel mine.

Main Features of the Land Mine Ban Treaty

There are several international agreements and treaties in place that regulate or ban the use of mines and explosive remnants of war under certain circumstances. In December 1997, 122 governments signed an international agreement: the 1997 Mine Ban Convention, commonly known as the ‘Ottawa Convention’ or the ‘Ottawa Treaty’ and referred to as ‘Mine Ban Treaty’ to globally ban the use of anti-personnel landmines. Today, 156 states are legally bound by the convention following accession or ratification.³ Bangladesh is one of those countries that signed the treaty on 7 May 1998. When states commit to the requirements of the Mine Ban Treaty, they are legally obliged to do and when countries join the Mine Ban Treaty, states commit to:

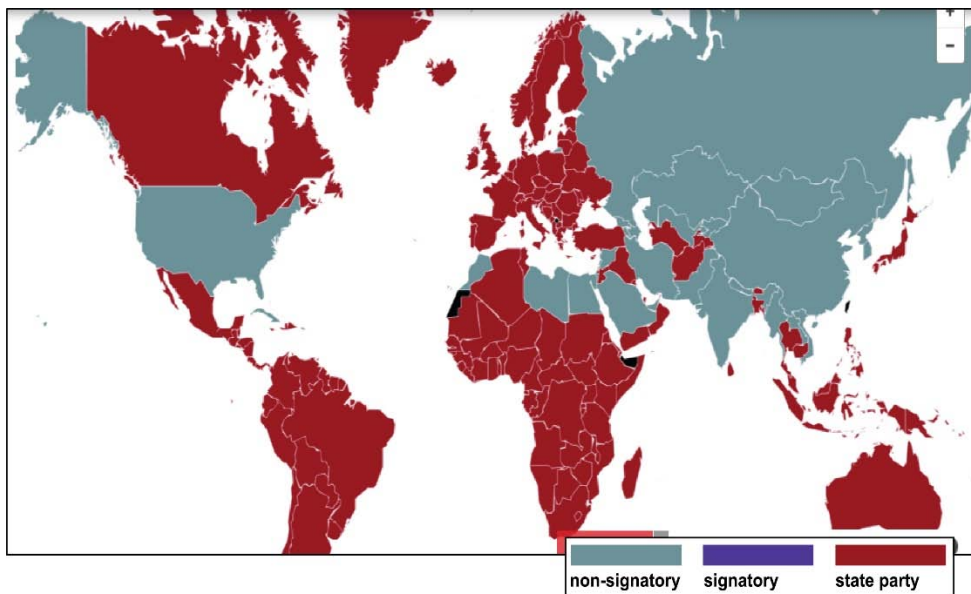
- a. Never use antipersonnel mines, nor to develop, produce, otherwise acquire, stockpile, retain, or transfer them.
- b. Destroy mines in their stockpiles within four years.
- c. Clear all mined areas in their territory within 10 years.
- d. In mine-affected countries, conduct mine risk education and ensure the exclusion of civilians from mined areas.

- e. Assist in the care and rehabilitation, and social and economic reintegration, of mine victims.
- f. Offer assistance to other State's Parties, for example in providing for survivors or contributing to clearance programs.
- g. Adopt national implementation measures (such as national legislation) to ensure that the terms of the treaty are upheld in their territory.
- h. Report annually on progress in implementing the treaty.⁴

World Signatory Status

There are 164 States Parties to the treaty and the treaty is still open for ratification by one signatory and for accession by those that did not sign before March 1999. States not party to the Mine Ban Treaty include China, Egypt, India, Israel, Pakistan, Russia, Myanmar, the USA. However, this does not take away from the importance of the treaty, nor weaken its achievements as one of the few current success stories in International Humanitarian Law and multilateral diplomacy. Eighty percent of the world's states have joined the treaty, and even without China, Russia, and the US, great progress is being made in implementing and promoting its provisions. In sum, the ban and the treaty are working, even without these holdout countries.

Figure-1: World Signatory Status



Source: <http://archives.themonitor.org/index.php/publications/display?url=cmm/2011/maps/treaty.html> accessed on 27 June 2021

Definition of Antipersonnel Mine According to Land Mine Ban Treaty

The treaty defines an Anti-personnel mine as follows:

‘A mine designed to be exploded by the presence, proximity or contact of a person and that will incapacitate, injure or kill one or more persons. Mines designed to be detonated by the presence, proximity or contact of a vehicle as opposed to a person, that is equipped with anti-handling devices, are not considered Anti-personnel mines as a result of being so equipped.’⁵

This definition clarifies the following:

- a. Only victim-actuated anti-personnel mines are prohibited.
- b. Mines actuated by vehicles have been kept out of the purview.
- c. Anti-vehicle mines fitted with Anti Handling Devices shall not be termed Anti-personnel mines.

However, the retention or transfer of several anti-personnel mines for the development of training in mine detection, mine clearance, or mine destruction techniques is permitted. The number of such mines shall not exceed the minimum number necessary for the above-mentioned purposes.⁶

Convention on Cluster Munition, Dublin Treaty 2008

The Convention on Cluster Munitions includes an obligation never to use, produce, transfer or stockpile cluster munitions. It also includes several positive obligations to ensure no further use and to redress past harm caused by the weapons. Bangladesh is not yet a signatory to this coalition but will continue its support for the noble cause of this Convention on Cluster Munitions in Principle. Article 2 of the convention defines Cluster Munition which states that:

“Cluster Munition” means a conventional munition that is designed to disperse or release explosive submunitions each weighing less than 20 kilograms, and includes those explosive submunitions. It does not mean the following:

- a. A munition or submunition designed to dispense flares, smoke, pyrotechnics or chaff; or a munition designed exclusively for an air defence role;
- b. A munition or submunition designed to produce electrical or electronic effects;
- c. A munition that, to avoid indiscriminate area effects and the risks posed by unexploded submunitions, has all of the following characteristics:

- Each munition contains fewer than ten explosive submunitions.
- Each explosive submunition weighs more than four kilograms.
- Each explosive submunition is designed to detect and engage a single target object.
- Each explosive submunition is equipped with an electronic self-destruction mechanism.
- Each explosive submunition is equipped with an electronic self-deactivating feature.⁷

The Implication of the Land Mine Ban Treaty on Strategy/Operational Capability

The signing of the Land Mine Ban Treaty would have an impact on our military operations/strategy. Without anti-personnel mines, anti-tank mines would be exposed to the enemy. It would enable an enemy to breach anti-tank mines easily. As such, the enemy will be able to establish a bridgehead easily with less time and minimum effort. It would also deter its forces from canalizing an enemy. Mine fearness in the mind of the enemy would substantially reduce, which would restrict my forces to cause sufficient delay to the enemy and ultimately this will reduce reaction time for my forces.

Inadequate geographical depth will compel Bangladesh to fight from few positional defences. In such a scenario, her defensive capability is likely to be affected without anti-personnel mines. Her enemy would have reduced the number of casualties, which could have otherwise been caused by anti-personnel mines. The enemy would be less cautious in her movement. It would be difficult to canalize the enemy into preselected killing areas. Therefore, the effect of artillery fire would be less. Gaps between defensive locations would not be easy to cover. It would also be difficult to separate enemy tanks from infantry. Own infantry would be extremely vulnerable to enemy attack in the absence of anti-personnel mines, as the enemy would resort to human wave attacks on her defensive position. Anti-personnel mine acts as a force multiplier to the defender. Without it, the enemy will maintain high momentum. In TRD, it would be difficult to inflict delay on the advancing enemy and achieve a clean break.

Bangladesh does not have any ambition to launch any offensive. However, within the overall defensive posture, offensive operations may be indispensable to regain lost territory or to seize a fleeting opportunity. During offensive operations, it would be difficult to block the enemy, cover the flanks of the attacking troops, and take up a defence during reorganization. Own troops are likely to suffer heavy casualties while facing enemy minefields due to inexperience in mine handling.

At the strategic level, anti-personnel mines are used to deny the enemy free access to certain terrain or to force him to use the terrain of her choosing. At the tactical level, they are used to guard the flanks of a defensive position and plug the gaps between them. With the banning of using landmines, there would be a need for additional forces to serve this purpose.

Findings from the Land Mine Ban Treaty

The treaty covers only anti-personnel mines; however, it does not address mixed mines, anti-tank mines, remote controlled claymore mines, self destructive mines, Anti-Handling Devices (Booby Traps), and other 'static' explosive devices. As such, Bangladesh may adopt any of the following options:

- a. Laying of anti-tank mines with Anti- Lifting/Anti Handling Devices.
- b. Rocket-Delivered Mines System (RDMS).
- c. Bar Mine.
- d. Use of Claymore Mine.
- e. Family of Scatterable Mines (FASCAM).

Findings from the Land Cluster Munition Treaty: Though Bangladesh is not a signatory to the treaty; due to her commitment and credibility in promoting global peace, it is important to have a close look at the clauses of this important treaty. It allows the use of cluster munition in which each explosive submunition is equipped with an electronic self-destruction mechanism or with an electronic self-deactivating feature.⁸

A detailed analysis of the land Mine Ban Treaty reveals that a signatory state is at liberty in using any suitable type from the Family of Self Destructive Scatterable Mines or FASCAM. FASCAM is an umbrella appellation for a range of systems. Systems that are part of the FASCAM include the following:-

- a. Remote Anti-Armour Mine System (RAAMS).
- b. Area Denial Artillery Munition (ADAM).
- c. GATOR mine system (air-dropped).
- d. Volcano mine system (various vehicles).
- e. Modular Pack Mine System (mine dispenser released on command from a remote control system).

SCATMINES

Mechanically laid mines cannot be buried like hand laying, so they remain exposed on the surface. They also cannot be laid following any strict pattern. They remain scattered on the ground. That is why mines laid by modern mechanical methods are given a general name- “Scatterable Mine System or SCATMINE.”

Figure-2: Scatterable Mine System or SCATMINE

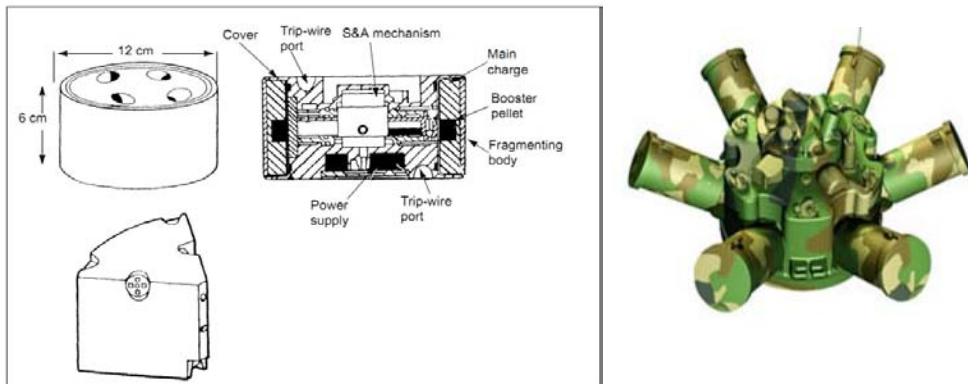


Source: *Mine Warfare ATP 03-1634*, Army Training and Doctrine Command, Army Printing Press, December 2018, pp. 13-1 to 13-4

Types of SCATMINES

Anti-Personnel (AP) SCATMINES: There are two shapes of anti-personnel SCATMINES, wedge-shaped and cylindrical shaped. Cylindrical anti-Personnel mines have both blast and fragmentation effects in the same mine. The kill zone of fragments is 10-15 meters. They can be pre-fitted with trip wires which deploy after delivery. A tension of around 0.9 pounds on the trip wire is enough to actuate the mine. Their size is around 4.75 inches by 2.6 inches. They contain 1-2 pounds of explosives and their total weight is less than 4 pounds.

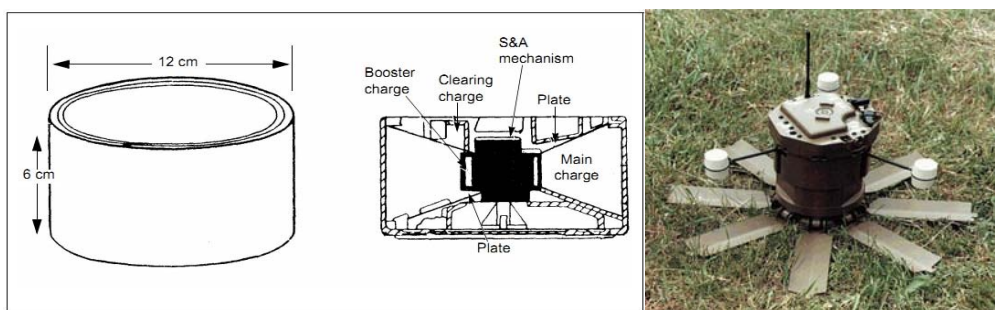
Figure-3: AP SCATMINE



Source: *Convention on Cluster Munitions*, Dublin, 30 May 2008, pp. 3-4

Anti Tank (AT) SCATMINES: Most of the AT SCATMINES have a magnetic-influenced fuse. The large mass of iron in tanks generates a magnetic field. When the tank comes close to the mine, the magnetic field crosses certain intensity, thus the mine gets detonated. They may also have Explosively Formed Projectile Warhead. On detonation, a slug of molten metal is projected which punches a hole through the belly of the tank. As it penetrates the tank's armour, shrapnel is sprayed throughout the compartment killing all the crew instantly. They are smaller in size than classical AT mines, only 4.75 inches by 2.6 inches in size, the same as AP SCATMINES. They have two or more self-destruct times.

Figure-4: AT SCATMINE



Source: *Convention on Cluster Munitions*, Dublin, 30 May 2008, pp. 3-4

Characteristics of SCATMINES

All SCATMINES are self-arming. It is inevitable because the employment technique of SCATMINE needs the mines to be self-arming. The arming signal is given by remote control-like systems. After receiving the arming signal the mines arm

themselves. At first, they carry out a self-test. The mines that do not pass the self-test, destruct by themselves (self-destruct) immediately. The time required for self-arming for various SCATMINES is given at the end of the chapter.

They are almost always self-destructive. Most of them self-destruct within 15 days of arming. It may seem disadvantageous to the defender. But it is not. Modern warfare is too mobile to have minefields laid for months. Laying mines well before enemy arrival actually reduces the flexibility of the commander to modify his defence plan as a resource has already been committed. Moreover, laying well ahead is only possible in case of deliberate defence, not in other operations. Modern mine-laying techniques are so fast that minefields can be laid within 5 minutes. So, there is no need to lay them too early. They can be laid when enemy arrival is imminent and when the skirmish is over; the minefield is not needed anymore. Mines destroy themselves and the area becomes open for movement again. No need to go through a painful recovery procedure. SCATMINES are laid normally in 400m x 400m blocks. Multiple blocks can be laid side by side if more frontage or depth is required.⁹

They have any or all of the following activation mechanisms:

- a. Anti-disturbance-based actuator.
- b. Seismic sensor-based actuator.
- c. Magnetic field-based actuator.

A few examples of SCATMINES are as follows:

- a. M691/M731 is a type of SCATMINE set. It is composed of 36 trip wire activated blast type mines with Anti Handling Device. Self-destructs after around 24 hours of arming. A 400m x 400m minefield can be laid within 5 minutes.
- b. M718/M741 set contains nine magnetic-influenced fused, self-forging, fragmentary-type mines with Anti Handling Device. Self-destructs after around 24 hours of arming. A 400m x 400m minefield can be laid within 5 minutes.

The capabilities of SCATMINES are briefly described below:

- a. Faster Response: SCATMINES can be employed more rapidly than conventional mines. Thus they provide commanders with greater flexibility and more time to react to changes in enemy situations.
- b. Remote Placement: SCATMINES can also be remotely employed. This allows the commander to employ mines in a remote location in no time, and to employ mines in areas which are not accessible, such as enemy-occupied terrain.

- c. **Increased Tactical Flexibility:** Upon expiration of the self-destruct time, the minefield is cleared and the commander can move through an area that was previously mined. This gives more tactical flexibility.
- d. **Efficiency:** SCATMINES can be employed by a variety of delivery methods. They can be deployed by fixed-wing aircraft, helicopters, artillery and vehicles. They satisfy the high mobility requirement of modern warfare.
- e. **Increased Lethality:** AT SCATMINE's capability to kill the crews make them more lethal. Current AT SCATMINES are designed to destroy any tank in the world.¹⁰

There are some limitations of SCATMINES that are briefly given below:

- a. **Extensive Coordination:** As SCATMINES are very dynamic, new SCATMINES are laid in no time, therefore proper coordination is to be made with higher Headquarters, and adjacent and subordinate units to keep everyone abreast. To prevent friendly casualty, all affected units must be notified of the location and the duration of SCATMINES.
- b. **Proliferation of Targets:** Since laying SCATMINES is very easy, commanders may be tempted to lay them in abundance. Therefore, target requests must be carefully evaluated and a priority system must be established. Indiscriminate use will result in the rapid depletion of the resource.
- c. **Accuracy of Placement:** SCATMINES cannot be laid with the same accuracy as classical mines.
- d. **Less Effectiveness of AT SCATMINES:** Due to their small size, reduced explosive and possibility of landing with an improper orientation (on the other side or at an angle), AT SCATMINES have less chance of destroying a vehicle than classical AT mines. Moreover, the effect of SCATMINES in water obstacle is reduced, because 5 cm of water prevents the formation of the metal slug.
- e. **Visibility:** Because of their means of delivery, SCATMINES will lay exposed on the surface of the ground. However, to minimize this limitation a percentage of SCATMINES have inbuilt anti-disturbance devices from the factory, so that they cannot be manually removed or tampered with.
- f. **Functional Anomaly:** Since modern mines are too delicate, they lack the robustness of classical mines. Sometimes the mines detonate for no apparent reason. 1.5 percent of mines self-destruct before they reach 80 percent of their lifetime. 5 percent of mines just do not work. Mines remaining after their prescribed self-destruct time should not be considered dead rather should be treated as dangerous Unexploded Ordnance (UXO) and should be dealt with accordingly.¹¹

Table-1: Characteristics of AP SCATMINES

Mine	Delivery System	DODIC	Arming Time	Fuse	Warhead	AHD	HD Time	Explosive Weight	Mine Weight	Number of Mines
M67	155-mm artillery (ADAM)	D502	Within 1 min after ground impact	Trip wire	Bounding frag	20%	4 hr	21 g Comp A5	540 g	36 per M731 projectile
M72	155-mm artillery (ADAM)	D501		Trip wire	Bounding frag	20%	48 hr	21 g Comp A5	540 g	36 per M692 projectile
BLU 92/B	USAF (Gator)	K291 K292 K293		Trip wire	Blast frag	100%	4 hr 48 hr 15 days	540 g Comp B4	1.44 kg	22 per CBU 89/B dispenser
M77	MOPMS	K022		Trip wire	Blast frag	0%	4 hr (Recycle up to 3 times)	540 g Comp B4	1.44 kg	4 per M 131 dispenser
Volcano	Ground/air	K045		Trip	Blast frag	0%	4 hr	540 g	1.44 kg	1 per

Source: *Mine/Countermining Operations*, FM 20-32, Department of the Army, Washington DC, February 2004, pp. 3-5

Recommendations

The concept presented in this paper is not an end in itself. This is a technology which is being widely used by many of modern armies including the USA. There are many forms of SCATMINES commercially available. Since the analysis of the Land Mine Ban Treaty and Cluster Munition Treaty (though Bangladesh is not a signatory of it) allows the use of self-destructive cluster munition like SCATMINES, so Bangladesh Army may explore this option further to come out of the existing difficulties arising from non-availability of antipersonnel mines. As such this paper recommends the following:-

First, the Headquarter ARTDOC may carry out further study on this concept through a Board of Officers and check its viability by ECSME. Second, if found suitable AHQ EinC's Branch, Engineer Directorate may take necessary steps for making the technical specifications consulting commercially available forms of SCATMINES, especially antipersonnel type. And, finally, if found technically feasible and commercially viable, Bangladesh Army may plan to procure any of the suitable systems of antipersonnel SCATMINE and allot those for the 10 and 24 Infantry Division with a priority and then to other field engineers units.

Conclusion

The complexity of the issue of alternative to anti-personnel mine is great from both humanitarian as well as technological standpoints. The need for the introduction of new designs and technology for alternative/improvement to anti-personnel mine is a necessity. Bangladesh needs to develop and introduce alternatives to anti-personnel mines which are economically viable and also within the adoptable technological capability.¹² In this context, SCATMINE Systems increases the effectiveness of the minefield. Some self-neutralization mines are programmable to last up to 365 days. Self-destructing mines are designed to be detonated/activated by their own fuzing mechanism, after a pre-determined period, while self-neutralizing mines 'render themselves inert' so that they no longer pose a threat. Bangladesh Army may adopt any of these options and offset the difficulties arising from the non-availability of anti-personnel mines.

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Brief Biography



Brigadier General S M Anwar Hossain, afwc, psc was commissioned on 19 December 1994 with 31 BMA Long Course. He has the experience of serving in various Staff, Instructional and Command appointments at different levels. He commanded the 6 Infantry Brigade and 17 Engineer Construction Battalion at Cox's Bazar and Dhaka. He served as the Managing Director of Jolshiri Abashon and worked as Additional Director General of the 24 Engineer Construction Brigade. He is a Distinguished Instructor of SME, ECSME. His important staff appointments include Brigade Major of 98

Composite Brigade, Private Secretary to the Principal Staff Officer, Armed Forces Division, General Staff Officer Grade-1 in Headquarters Army Training and Doctrine Command and Army Headquarters E in C's Branch (Engineer Directorate). He has attained Masters in Criminology and Criminal Justice System from Dhaka University and Masters in Environmental Engineering from the Military Institute of Science and Technology (MIST). He is presently undergoing National Defence Course 2023.

Space-Based Intelligence, Surveillance, Reconnaissance (ISR): A Looming Realities for Developing Nations

Group Captain Md Ahsan Habib, acsc, psc, GD(P)

Abstract

Understanding Space and its utility will serve as a force multiplier for any progressive force. In the context of Spacepower, ISR is the coordinated and integrated system for the collection, analysis, and dissemination of information and intelligence using space-based platforms or other platforms connected via space-based equipment. Active ISR can provide early warning of enemy threats as well as enable military forces to increase effectiveness, coordination, and lethality to support ongoing military operations. Hence, it is understood that the future era of the battlefield will be dominated by forces that will possess space-based ISR. With space-based ISR capability, developing nations will be able to perform surveillance and reconnaissance over their own and adversary territory, track military deployments, document weapons development, detect missile launches, and provide evidence of damage from bombs and other attacks. Because of the far-reaching effect of space ISR on military operations, an increasing number of nations across the world are trying to acquire this capability. But the issue of technology and cost is the major obstacle for these nations. As such, this paper will highlight the use of different space-based technologies and platforms to conduct ISR, their critical operating systems, and how space-based ISR augments the operational efficiency of the military including various limitations and future opportunities for developing nations.

Introduction

History reveals the forces who occupied the “higher ground” of the battlefield were in a better situation. Thus, most victorious forces have always looked for hilltops as high ground and tried to control them. With the invention of the aeroplane, the air became the vital new high ground and seized everyone’s attention. Subsequently, with the advancement of technology, the definition of the “high ground” has changed from hills to the aerial platform and now very well included space. Thus, understanding space and its utility will serve as a force multiplier for any progressive force. Since the 1950s, space has been an integral part of military planning, strategy, and operations. In the last more than 60 years, peoples’ reliance on space has gone from academic interest to a compelling need. Presently, the application of ISR has become a decisive factor in losing or winning a battle which was evident in Gulf War (02 August 1990-

28 February 1991) during Operation Desert Storm. For example, just for USAF, there has been a 6,811% increase in unmanned ISR from 2001 to 2012. At the same time, the data processing rate has gone from 255 Terabytes per month to 1.28 Petabytes per month.

In the context of spacepower, ISR is the coordinated and integrated system for the collection, analysis and dissemination of information and intelligence using space-based platforms or other platforms connected via space-based equipment. The freedom of manoeuvre and global access provided by space ISR capability is unique. It greatly enhances the process of planning and conducting military operations. Active ISR can provide early warning of enemy threats as well as enable military forces to increase effectiveness, coordination, and lethality to support ongoing military operations. Though there are obvious and inherent limitations of space-based technology such as cost, vulnerability and ease of prediction and detection; the strategic attributes of global presence, global perspective and global access outweigh its limitations.

Hence, it is understood that the future era of the battlefield will be dominated by forces that will possess space-based ISR. As such, this paper will highlight the use of different space-based technologies and platforms to conduct ISR, their critical operating systems, and how space-based ISR augments the operational efficiency of the military including various limitations and future opportunities.

Surveillance and reconnaissance are how air and space power provide intelligence and situational awareness, whether for operational level commanders taking a theatre-wide outlook using space-based assets, or individual soldiers using live video feeds from manned or unmanned aircraft.¹

This paper aims to analyse the challenges and identify various opportunities regarding the use of spacepower for ISR purposes. ISR can be done using humans, the internet, aircraft, and satellites. Space ISR mainly uses space platforms, but it also integrates other platforms through space-based platforms like Global Positioning Systems (GPS) and communication satellites. This makes space ISR multi-domain, multi-sensor, real-time capability to act at an unprecedented speed. Without space ISR, it is not possible to utilise the true potential of airborne and cyber ISR. Besides, a developing nation may use space-based ISR for the following purposes:-

Navigation: In peacetime, ISR based satellites can be used for satellite-based navigation systems like the Global Positioning Systems (GPS).

Intelligence Gathering: The reconnaissance satellites are used to spy on other countries which provide intelligence information on the military undertakings of external states.

Safety: Space-based ISR satellites can also monitor ocean and wind currents as well as the extent of forest fires, oil spills, and airborne pollution; together this information helps organize emergency responders and environmental clean-up. Satellites can take the search for people in distress in remote regions. Distress radio beacons directly linked to a search and rescue satellite can lead rescuers quickly and accurately to a land, sea, or air emergency location.

Sign of Strength: If a developing nation possesses ISR satellites, its potential adversary will remain cautious about their action. This will also give a signal to an adversary that his action is monitored and may provoke action.

Technological Advancement: Satellite technology is advancing very fast. So developing nation needs to remain at par with the world's latest technology to get the maximum benefit out of globalization.

Evolution of Space-Based ISR

The concept of space ISR began with the perception of satellites. Satellites were first conceived by Arthur C. Clarke in 1945 who proposed the feasibility of establishing a communication satellite in a geostationary orbit. Ten years later, in 1955, both the United States and Russia planned to position artificial satellites. Within a span of just two years, Russians accomplished the feat by launching Sputnik-1 on 4 October 1957. The United States launched its first satellite Explorer-1 on 31 January 1958.

Figure-1: Sputnik 1- the 1st Satellite of the World



Source: <https://en.wikipedia.org/wiki/Sputnik>

Phases in Space Militarization

Different phases are briefly recommended below:

First 30 Years of Space Power (1957 - 1985): Back in 1957, with the launch of Sputnik by the then USSR, the possibility of utilising space for performing a variety of functions became attainable. The obvious need for space ISR in maintaining its security made the superpowers take a stance for a space environment free from weapons. Hence, the role of satellites performing ISR function was legitimized in several treaties.

Space Militarization to Space Weaponization: In 1983, with the Strategic Defence Initiative (SDI) of the USA, the contest of space weaponization began. Though the space powers had been performing space ISR, the effects of extensive integration of C4ISR in the conventional war had not been seen by the world before the first 'Space War - Operation Desert Storm during the Gulf War of 1991 where the USA and NATO forces employed B-52s and those were controlled via satellite communications.⁶

The emergence of New Space Powers: Understanding the enormous potential of space-based ISR, China directed its endeavour for space militarization. China demonstrated its ability to destroy a satellite in orbit in 2007 using an ASAT weapon. At the same time, Russia has reorganised its space militarization programmes.

Platforms for Space-Based ISR

Satellites are the primary platform for space-based military ISR. But the complete system includes other elements. The system can be defined in three segments: the space segment, the terminal segment and the mission control segment. These segments are briefly discussed as follows:

The Space Segment: This segment comprises of satellites positioned in orbits. Military reconnaissance satellites are mainly of four types:

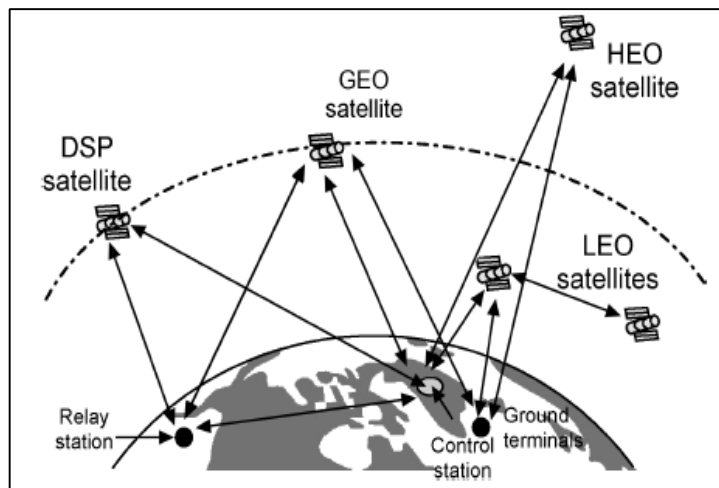
Imagery Intelligence (IMINT) Satellites: These satellites constitute the largest category of military satellites. They are placed in low, near-polar orbits at altitudes of 500-3000 km as they take high-resolution close-up images. The resolution of images provided by these satellites is of the order of a few centimetres. These satellites were widely used by the USA during Operation Desert Storm in 1992.

Signal Intelligence (SIGINT) Satellites: SIGINT satellites detect transmissions from broadcast communication and non-communication systems such as radar, radio and other

electronic systems. These satellites provided one of the first warnings of the possibility of an Iraqi invasion of Kuwait.

Early Warning Satellites: Early warning satellites provide timely information on the launch of missiles, military aircraft and nuclear explosions by the enemy to military commanders on the ground. These systems may require satellites in Lower Earth Orbit (LEO), Geo Stationary Orbit (GEO) and Higher Earth Orbit (HEO) for complete coverage.

Figure-2: Satellite Early Warning System



Source: <https://en.wikipedia.org/wiki/EarlyWarningSystem>

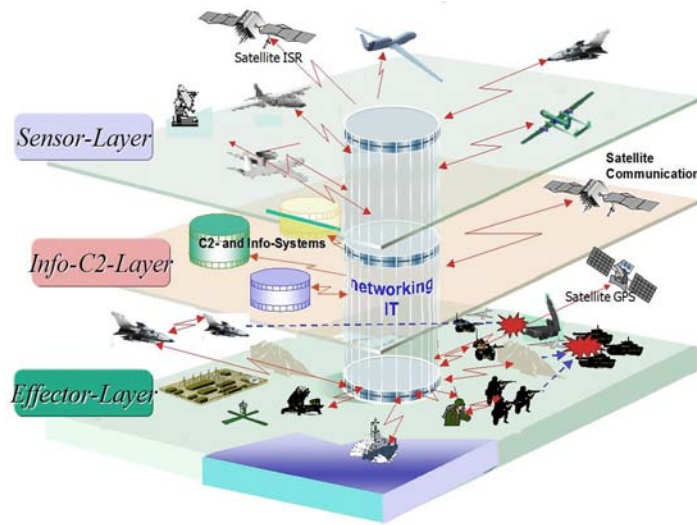
Nuclear Explosion Detection Satellites: These are to detect nuclear explosions on the Earth and in space to monitor worldwide compliance. GPS satellites perform this task.

The Terminal Segment: It is composed of communications terminals installed on ships, submarines, aircraft, vehicles and ground troops.

Mission Control Segment: This segment comprises of C2 establishments which receive ISR from satellites, process the information, create viable intelligence, take a decision and transmit it to the terminal for the desired action.

Space ISR system is integrated with the network-based operation. Overall system operates in three layers which are as follows:-

Sensor Layer: This comprises of ISR satellites, AEW, AWACS, UAV and other ISR sensors which collect ISR data.

Figure-3: Space-Based ISR Network Operation

Source: https://en.wikipedia.org/wiki/Space-Based_ISR_Network_Operation

Info C2 Layer: The C2 establishments and communications satellites operate in this layer.

Effector Layer: All troops on the ground, ground force equipment, aircraft, and maritime vessels operate in this layer. They receive a command from the C2 layer along with intelligence from the Sensor layer.

Significance of Space-Based ISR

The importance of space-based ISR is observed through the series of military operations. Some of those are narrated below:

Collection of Strategic and Tactical Intelligence: Space-based ISR capabilities allow the military to gather and analyse strategic and tactical intelligence which is crucial for success in any military operation. Space-based intelligence, surveillance, and reconnaissance military operations heavily depend on ISR for collecting information about the enemy, terrain, weather, and other aspects of the Area of Operation that will affect friendly combat operations. During the 1973 Arab-Israel War, America launched an 'Agenda D' satellite and provided intelligence information to Israel for their military use and influenced the outcome of the war.

Global Coverage: Another important advantage of space-based ISR capabilities is their worldwide coverage over denied zones where little or no data can be acquired from ground and airborne sources. These systems possess mission endurance and bargain vulnerability to adversary feat.⁸

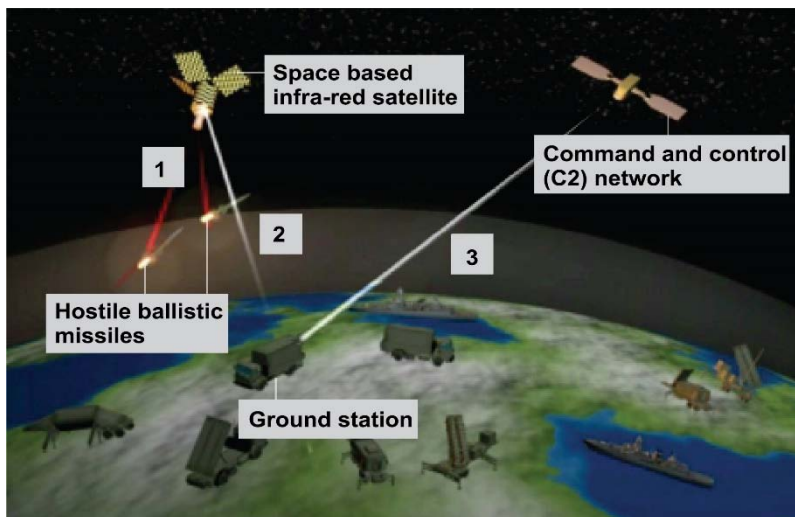
Integration of Intelligence: Space-based ISR for military intelligence operations has been extremely useful while operating in various countries with the use of multiple forms of intelligence. Human Intelligence (HUMINT), Geospatial Intelligence (GEOINT), Measurement and Signature Intelligence (MASINT), Open Source Intelligence (OSINT), Strategic Intelligence (STRATINT), Signals Intelligence (SIGINT), and Technical Intelligence (TECHINT).

Enhancing Military Planning: ISR platforms can augment military planning by providing efficient information regarding terrain, adversary force dispositions, current intelligence, order of battle, scientific and technical intelligence assessments, targeting, and combat assessments. During the 1973 Arab-Israel War, Russia learned about Israelis' possession of atomic weapons through the COSMOS reconnaissance satellite.⁹

Flexibility: Commonly, the product of a space or terrestrial capability can enhance accuracy and shorten reaction times to the user by cueing another space system to survey an Area of Interest. Likewise, a space-based capability may be used to prompt a terrestrial-based system for more precise location, discrimination, and targeting.¹⁰

Integrated Missile Warning System: The United States Missile Defence Agency (MDA) has developed a Space Tracking and Surveillance System (STSS). Data from STSS satellites could allow interceptors to engage incoming missiles earlier than conventional missile detection systems. This will also augment ship and shore-based batteries' greater range to destroy rogue missiles. Besides, the Space-based Infrared System (SBIRS) is designed to provide key capabilities in the areas of missile warning, missile defence and battle space characterization.

Figure-4: Space-Based Infra-Red System



Source: <https://en.wikipedia.org/wiki/SpaceBasedInfra-RedSystem>

The Strategic Implication of Space-Based ISR

The ability to perform ISR from space transformed the nature of conventional warfare. The transformation is to a degree where space ISR capability has become the deciding factor for the outcome. However, the capability demands state-of-the-art technology and extensive funding which has made it limited to a few nations only. Therefore, nations around the globe aspiring to integrate space ISR for either military or civilian purposes must depend on space powers. This has an increasingly polarising effect on the world military and political environment.

Limitations of Space-based ISR

Different limitations of space-based ISR are discussed below:

First, space ISR relies on the availability of satellites in specific orbits and specific ground stations. Satellites need to relay information to ground stations while the satellites pass over the ground station. The time for relaying information is limited by the location of the ground station and the time a satellite gets over that ground station. Though this limitation can be reduced with relay satellites, the limitation cannot be completely overcome. Second, the main element of space ISR – satellites need to maintain very specific orbits. These orbits can easily be predicted from the properties of the orbit- orbit altitude, inclination, and period. This limitation makes satellites susceptible to interception and exploitation by adversaries.

Third, space resources are limited and requirements will be prioritised, so unlimited support for military commanders cannot be assured. Competition for bandwidth, tasking priorities and the physical access of satellites to specific locations may all affect the availability of space support. Finally, Space Situational Awareness (SSA) is the ability to view, understand and predict the physical location of natural and manmade objects in orbit around the Earth to avoid collisions.¹² SSA has become a prominent concern for both military and commercial systems, largely due to increasing military reliance on a range of space assets. But maintaining a high state of situational awareness in space is a very troublesome job.

Challenges of Space-Based ISR

Space is an environment where all actions are highly subject to different challenges. Some of the challenges related to space ISR are discussed below:

Limited Life Span: Satellite life span is limited by the amount of liquid fuel carried on board. Liquid fuel is required to run jets to perform orbital manoeuvres. For example, a large communication satellite has a lifespan of 10 – 15 years. After this, though the satellite is functional it has to be abandoned due

to the unavailability of fuel for manoeuvre. This is a serious challenge for operation and also a reason for the accumulation of space debris.

Limited Electromagnetic Spectrum: Satellites send images or information utilising the EM (Electro Magnetic) spectrum. But the spectrum is limited and military access is reducing due to an increase in commercial use. It is, therefore, difficult to maintain pace with the increasing demand.

Legal Considerations and Treaties: Some International laws, treaties, contracts and agreements could prohibit certain space assets from being used for military purposes. However, there are relatively few legal restrictions on the use of space for military purposes, other than for the deployment of weapons of mass destruction.¹⁴

Difficulty in Maintenance: Physical maintenance currently cannot be performed on most satellites while in orbit. Maintenance is conducted daily using RF (Radio Frequency) digital commands. Satellite maintenance relies on the use of redundant systems, robust design, and alternative subsystem configurations.

Vulnerability: Satellites are at risk from kinetic and non-kinetic attacks. Ground-to-satellite links are susceptible to jamming. Fixed command & control and launch facilities are vulnerable to conventional attack. Some space capabilities may also be subject to exploitation by adversaries, with GPS available for navigation and commercial imagery for targeting. The threats can be divided into reversible and irreversible categories which are highlighted below:

a. **Reversible Threats:** Reversible threats are the ones from which the satellite system can be recovered.

(1) **Cyber Attack:** Reversible threats to space-based assets include cyber-attack to associated command, control communications, and information (C3I) systems.¹⁵

(2) **Jamming:** Another troublesome development is the proliferation of jamming assets. GPS jammers are widely available, complicating the employment of GPS navigation and timing signals in weapons and platforms. Satellite communications jammers can impair over-the-horizon communications.

(3) **Overpopulation and vulnerability:** There is rising consciousness of the problem of congestion in space. Military, civil, and commercial

sectors are increasingly reliant on space capabilities, and this is a potential vulnerability as space becomes increasingly congested, contested, and competitive.¹⁶

b. **Irreversible Threats:** The effect of these threats cannot be reversed; the satellites cannot be recovered:

(1) **High-Power Laser:** High-power laser can cause permanent damage to satellites.

(2) **Ground-Based Missiles:** These are part of space weaponization where missiles launched from the ground hit satellites in the orbit. China and the USA have demonstrated this capability.

(3) **Co-Orbital ASAT (Anti Satellite Weapon):** These are ASAT weapons launched into the same orbit as its potential target. Both China and the USA have demonstrated the technology.¹⁷

(4) **Physical Attack:** Physical attacks or sabotage can be used against the critical ground facilities associated with space systems to disrupt, deny, degrade, or destroy the utility of the space system.¹⁸

(5) **Nuclear Detonation (NuDet):** The final irreversible threat and one which can be a worst-case scenario is a nuclear detonation (NuDet) in the atmosphere or space. Although the number of actors in space capabilities is increasing, the likelihood of a NuDet is still very small.¹⁹

(6) **Debris:** The growing debris problem is a concern to spacecraft operators in all sectors: military, civil, and commercial.

Requirement of a Network-Centric Structure: Optimum utilisation of space ISR necessitates the availability of an integrated joint communication structure. It requires a truly seamless ground, air, and space connectivity architecture for both individual communications channels and networks which is very difficult to achieve due to inter-service issues.

Challenges in Acquiring Space-based ISR

The challenges discussed above are the ones faced in maintaining space ISR after the capability has been achieved. For nations aspiring to acquire the capability, the challenges are different. These challenges come in terms of technology, cost, and other organizational matters.

First, the single greatest constraint on the exploitation of space has been the cost. A typical communication satellite cost more than 200 million US dollars. For example, the Bangabandhu-1 satellite launched for Bangladesh costs at least 240 million US dollars. Second, space-based ISR is heavily technology dependent. Acquiring the capability requires formidable advances in aerospace, sensors, control and robotics, communications and networking and others which are all high-level technology. As such, these are difficult for developing nations to develop. Third, technology for space ISR is limited to a few developed nations. This makes international cooperation a major prerequisite in the acquisition of space ISR capability. Nations other than the US and Russia have acquired the technology through international assistance. For example, Israel, South Korea, Turkey, etc, received support from the Western bloc nations. Whereas, North Korea, Iran, Pakistan, Nigeria, etc., have depended on eastern bloc nations China and Russia. Therefore, for a developing nation to obtain a space ISR system, it is a challenge to first have approval and assurances for assistance from the international community. Finally, the lack of appropriate human resources is an important issue. Planning for the requirement and the process for acquisition require technical experts in satellite technology, ISR system, and communication system. This expertise is rare in developing nations.

Prospects for a Developing Nation

The requirement of space ISR capability for developing nations or air forces can be outlined as follows:

First, it is important to perform surveillance and reconnaissance over own and adversary territory. ISR satellites can track military deployments, document weapons development, detect missile launches, and provide evidence of damage from bombs and other attacks. Second, they may perform remote sensing tasks along with military ISR. Finally, they may perform geodesic survey data and help the military create better maps and improve navigation and positioning accuracy.

Acquisition of Military Space ISR Capability by Developing Nations

Acquisition of military space ISR capability is an expensive affair. It involves the manufacturing of a satellite, launching it into orbit, acquisition of orbital slots, and ground stations, and maintaining the complete system. Though the financial and technological requirements have prevented many developing nations from utilising space, several nations have managed to do so. Some aspects are briefly highlighted below:

First, Cooperation between nations is important. This has become a growing trend in modern military technology. While there will always be an interest in maintaining a

nation's individual capabilities, cooperative pooling of resources among nations and joint commercial ventures is becoming more common.

Second, the development of the commercial space industry is the first step for space ISR. Several commercial satellites can have military applications. The commercial space industry allows enterprises and companies to invest in and develop the space industry. Nations' military can then benefit by integrating these commercial assets into the national network and receiving assistance regarding the development of space ISR capability.

Third, small satellites have become a critical part of national security in many countries. As older satellites near the end of their functional life, new technologies allow for better and cheaper satellites. Lower costs have allowed smaller countries, such as Turkey and Nigeria, to take advantage of satellite technology.

Finally, instead of going for a dedicated satellite for ISR, developing nations and even developed nations have used remote sensing, weather, and communication satellites for military purposes. Other nations can make extensive use of geostationary remote sensing and weather satellites for military ISR. These satellites could provide valuable information on adversary troops' disposition, movement and early warning.

Conclusion

Space-based ISR has taken an irreplaceable role in the overall military effort of developed forces. Recent wars in Iraq, Afghanistan, and Syria are a manifestation of the massive impact that satellite-based ISR has on the outcome of military engagements. Though military space ISR started with imagery intelligence, currently the technology includes complete exploitation of the EM spectrum in gathering intelligence from space. Space ISR has also been extensively integrated with satellite communication, cyber network, and command and control network. This integration allowed commanders to gain access to intelligence and communicate decisions quickly. Further development in technology these days provides commanders with more accurate and detailed intelligence along with live feed from elements on the battlefield. This optimises the total war effort to a level never imagined before.

Because of the far-reaching effect of space ISR on military operations, an increasing number of nations across the world are trying to acquire this capability. But the issue of technology and cost is the major obstacle for these nations. Moreover, because of the military edge provided by space ISR, there are strategic implications involved. Regional tensions and ambition have resulted in nations' desperate efforts to develop space-based ISR systems. Thereby, several developing nations have gained considerable capability in exploiting satellites for ISR. International cooperation,

civil-military integration, and advances in technology have allowed these nations to succeed. However, for acquiring space ISR capability, some form of technical expertise is needed which the developing nations have gained. Keeping these in mind, for a developing air force to gather space ISR capability, it is necessary to develop the technical ability to accept and continue with the operation of satellite technology.

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Brief Biography



Group Captain Md Ahsan Habib, acsc, psc, GD(P) was commissioned in GD(P) Branch on 06 December 1998 from Bangladesh Air Force Academy. He completed Masters in Business Administration from the Southern University of Bangladesh and a Masters in Security Studies from Bangladesh University of Professionals (BUP). Besides various courses at home, he attended Junior Command and Staff Course in Malaysia, VIP Protection Course in Thailand and Tactical Intelligence Analysis course in Canada. He held various appointments during his career as BAF mentionable are; Instructor of 11 Squadron, Squadron Commander of BAFA, Flight Commander (Operations) of 18 Squadron, Flight Commander (Operations) of 9 Squadron, Deputy Director of Training (Flying), and Senior Staff Officer of Chief Inspectorate branch at Air Headquarters. He also commanded the 2nd Provost and Security Unit and 9th Squadron of Bangladesh Air Force. Besides serving in BAF, he also served in Special Security Force (SSF) as Deputy Director & Instructor of the Training Bureau, and Directing Staff at the Defense Services Command and Staff College. He participated UN Peacekeeping Mission in East Timor as a Pilot in Command and in Chad & Ivory Coast as Operations Officer. He is a graduate from of Air Command and Staff College, Air University, Alabama, USA. Presently, he is serving as Senior Staff Officer at the Directorate of Plans at Air Headquarters, BAF.

An Introspection into Security and Socio-Economic Implication of Border Road along South-Eastern Part of Bangladesh with Associated Challenges and Mitigation

Lieutenant Colonel Sarker Md Iqbal Hossain, psc, Engineers

Abstract

The south-eastern hilly region of Chattogram Hill Tracts (CHT) combining Khagrachari, Rangamati, and Bandarban is about 13,184 square km, which is approximately one-tenth of the total landmass of Bangladesh. 330 km of the border is with India and 210 km is with Myanmar. Both countries already have their border roads for their security. Till now, a certain length of the border in CHT is unguarded due to inaccessible terrain features and a lack of a well-developed road network. It also hinders exploring the multifarious potentials of the area. Therefore, the Government of Bangladesh has taken the initiative to construct a 1,036 km border road to secure and control the border management system as well as boost trade and tourism. The border roads may have significant positive socio-economic implications. It will also facilitate the security forces to establish dominance over the remote border areas to fight against insurgency and smuggling. There are many tactical and technical challenges in implementing the construction of border roads which need to be addressed in collaboration with local administration, local populace, and security forces. Thereby, the border road in CHT will open up a new doorway in terms of security and economic emancipation in the southeastern region of Bangladesh.

Introduction

The area of Chattogram Hill Tracts (CHT) combining Khagrachari, Rangamati and Bandarban is about 13,184 square kilometres, which is approximately one-tenth of the total landmass of Bangladesh. The mountainous rugged terrain with deep forests, lakes and beautiful waterfalls represents unique and divergent flavours compared to other parts of the country. Again, this area shares International Boundary (IB) with both India and Myanmar. A good number of ethnic groups like Chakma, Tripura, Marma, Chak, Pankho, Mro, and Bawm are mostly dominant inhabitants of this area. About 50% of people in the hill districts are from the Bengali community. Till now, a certain length of the border in CHT is unguarded due to inaccessible terrain features.¹ Lack of a well-developed road network creates a barrier to establishing Border Observation Posts (BOPs) along the border. It also hinders exploring the multifarious potentials of the area. So, a well-developed road network along the border with a required number of connecting roads is necessary keeping the tactical factors in consideration to utilize these roads in favour of the Security Forces (SFs) during peace and war.

Bangladesh's Government is very much committed to the country's overall socio-economic development through maximum and judicious utilization of its natural resources. CHT is one of the country's most remote, underdeveloped, and poor regions. Therefore, the Government has been taking various development programs throughout the region. As part of the program, to increase the connectivity of the region with the whole country, the Ministry of Road Transport and Bridges has planned to construct a 1036 km road along the border of the CHT districts with the neighbouring countries Myanmar and India to facilitate access to the bordering areas of the CHT districts. Despite being one of the most beautiful and resourceful regions of the country, the CHT region has long been deprived of development due to its remoteness as well as rough terrain. Thus, the success of the border road project is very vital for the development of the region as well as for ensuring the security of the country.²

This paper aims to analyze the security, environmental and socio-economic implications of the border road in the south-eastern region of Bangladesh with associated challenges and mitigation measures in implementation. This paper has initially unfolded with the conceptual framework of constructing a border road in the south-eastern region of Bangladesh. Then the main focus will be drawn to exploring the relevant security, environmental and socio-economic implications of the border road. Lastly, an effort will be taken to bring out the associated challenges and mitigation measures in the implementation of the border roads.

Conceptual Framing of the Border Roads in the South-Eastern Region of Bangladesh

The salient points of the conceptual framework are briefly discussed below:

Bordering Features of India: Bangladesh shares a 4427 km border with her two neighbours, India and Myanmar. The border length with India is about 93.88% of the whole borderline, and that consists of the plain, riverine, hilly, and jungle without any major natural obstacles. The 'Zero Line' in some places passes through houses, villages, and ponds dividing the families even. The area is also heavily populated, and the people of both sides use almost every inch of bordering area land in a different form. People's language and culture are indistinguishable in the bordering area and difficult to differentiate. However, the border management challenges like informal trade/smuggling, drug, arms and human trafficking, killing, etc. remained alive. India erected a 3106.40 km fence along the border to contain smuggling, and illegal gratification and stop the cross-border movement of the militants. Under the Comprehensive Integrated Border Management System (CIBMS), India planned to equip the unfenced areas along the border with sensors, enabling the troops to take

prompt action against intrusion. Due to the ground configuration, all the places are not covered adequately. Conduct of routine patrolling is mainly undertaken to monitor, supervise, dominate and deter illegal activities along the border.³

Bordering Features of Myanmar: On the contrary, Bangladesh maintained a 271 km border with Myanmar which runs along the river Naaf and through the hilly terrain. Though the border is well-defined, border-related crimes are not limited. Myanmar started construction work of a fence along the Bangladesh-Myanmar border in 2010 under four phases to prevent illegal entry from the country's western gate. Already 106.6 km of border fencing is completed. Myanmar may have a plan to complete fencing all along the bordering area with Bangladesh. Border fences augmented by laying landmines mostly to prevent the return of Rohingyas even in the face of huge international criticism and also for not signing the Mine Ban Treaty of 1997 U.N.⁴

Background of the Border Road Project: Bangladesh's south-eastern hill region shares 330 km of its border with India and 210 km with Myanmar. Myanmar and India have borders with Bandarban, Rangamati, and Khagrachari. Both the countries already have their border roads to ensure security in the areas. Therefore, the government of Bangladesh has taken the initiative to construct a 1,036 km border road across the three hill districts to aid the fight against smuggling as well as boost trade and tourism. The Executive Committee of the National Economic Council (ECNEC) approved the first phase of the border road on 20 March 2018.⁵ The phase includes the construction of 317 km of new roads along the country's south-eastern border by June 2024. The total work to construct 1036 km of the border road will take approximately 10 years. The Government of the People's Republic of Bangladesh, Ministry of Road Transport and Bridges has entrusted the Corps of Engineers, Bangladesh Army with Border Road (Rangamati, Khagrachari & Bandarban Hill Districts) Construction Project Phase-1 (317 km) financed by GOB. The project will be implemented under the technical control of the Engineer in Chief (E in C) and under the direct supervision of HQ 34 Engineer Construction Brigade. The Government Order for the construction of Border Rd (Phase-1) was published on 20 June 2018. The physical work started in July 2019.

The Socio-economic Implication of Border Road

CHT is enriched with forest resources covering 50% of Bangladesh consisting of 0.67 million hectares of hilly lands. These districts have bio-diversified natural habitats, wildlife, and ancient heritages. These wonders of nature provide a great emotional and learning experience to the visitors enjoying the beauty of it. According to statistics, 2.5 to 3 million tourists visit CHT every year. Sajek, Nilgiri and Chimbuk have become lucrative destinations for native tourists which were inaccessible a few years

back. The border road will create opportunities for local communities and private entrepreneurs to build new hotels, motels, and resorts to support the tourism industry.⁶

Figure 1: Tourism in Border Areas



Source: Author's self-collection

CHT is rich in natural resources like sandstone, bamboo and lumber. The population of the CHT is just 1,325,000, and the population density is only 190 people per square km. The CHT spans a total area of 13,184 square km (BCR: 1991). If one computes the land pattern, looks at the land account of CHT, and then compares all of that to the plain land pattern of Bangladesh, then CHT will be found to be the most densely inhabited place in Bangladesh. Only 9% of the land of the CHT, equivalent to 356.04 square miles or 572.99 square km, is legally permissible for human settlement. The Reserve Forest and Kaptai Lake area encompass 91 percent of the territory in the CHT. However, without access to remote areas, the local communities are unable to utilize the land for their benefit. The completion of the border road will widen the horizon of accessing remote areas for the local people. This will ensure government revenue and cut smuggling.

Agriculture is the primary means of subsistence for the vast majority of the people. The primary means of subsistence for the people who reside in the villages that surround more isolated locations is horticulture. Jhum cultivation is an old method that originated with the idea of not tilling the soil. It is generally considered to be environmentally beneficial provided that its natural cycle of 12-15 years is not disrupted.⁷ Despite this, more and more forestlands are being turned into agricultural areas, which makes the Jhumia people who live in this region the most vulnerable population in the CHT. Access to more land has become a vital factor in expanding the role of agriculture around the local areas since the demand is increasing day by day. Establishing the border road will provide the chance for the local communities to implement the agricultural practice on the new horizon of land. This will help to produce more goods which can be transported around the neighbouring regions.

Figure 2: Agriculture in Border Areas



Source: Author's self-collection

Establishing the border roads will create a new opportunity for the locals and tribal people to participate in formal trade and commerce. They can sell their agricultural and industrial products to vendors who will distribute their commodities to the rest of the country. Moreover, border-haats⁸ can be established with India and Myanmar to benefit the local people. Border haats will encourage the macro-economy of the area to develop and flourish. It will also act as a catalyst to develop bilateral and trilateral relationships with the neighbouring states. Dohanichara, the meeting point of Bangladesh, India and Myanmar can be explored for business and commerce utilizing the border road.

Figure 3: Border Haat in Border Area



Source: Author's self-collection

The Impact of Border Road on Security Enhancement

Border Road establishment will not only impact the economic scale but also help the security forces to ensure national security and law enforcement agencies to provide security to local people and tourists. This aspect is briefly described below:

The Border Guards Bangladesh (BGB) is responsible to defend the land along the border areas of Bangladesh. The remote bordering areas of CHT are not accessible to BGB and remain porous. The project aims to build roads within 150-200 m from the IB with India and 50-75 m with Myanmar. This will allow BGB to establish BOPs along the border. This will enable BGB to keep the entire border under physical and

visual surveillance to stop cross-border movements aiming for smuggling and terrorism. Moreover, the link roads to the border will add an additional advantage to BGB in counter-insurgency operations nearing the bordering areas.

Figure 4: BGB Patrolling Border Areas



Source: Author's self-collection

The Army is a fighting force that fights mainly on land ensuring national security by fighting against the potential threat to a country. The army plays a major role in establishing security enhancement through border roads. First, the construction of border roads and link roads play a major factor to strengthen the operational ability executed by the Army. Without the border roads and link roads, there remains a situation where immobility is a big obstacle. The CHT regions are extremely remote and are not easy to navigate which provides the perfect hideout and route for the militants and exotic groups to use. The border road will help the Army to conduct strategic operations throughout the bordering areas by preparing themselves for any future threat.

Second, no terrorist act comes to harm the region with a warning. That is why the security forces need to make sure they are ahead of the strategy against the threat in case of an emergency. For precautions, our potential adversaries have already taken the extra step by establishing several bases for both Army and Air Force along the border during war. Establishing the border road and link ensures facilitating the construction of permanent or temporary bases, log bases, air force bases as well as other military installations which can generate operational value. These operations are a direct threat to the exotic groups and militants since they will stop their overall dominance of the territory and their movement will be minimized around the remote areas. The activities of the exotic groups can be strictly monitored and in case of any future attack, our security forces will be ready to defend against them.

Figure 5: Army Patrolling in CHT



Source: Author's self-collection

For the police and other law enforcement agencies, it is an extremely important factor in the upkeep of law and order as well as the preservation of peace over the whole of Bangladesh. Border roads will enable the Police and other law enforcement agencies in improving security in the local areas. The freedom of movement of the local and the tribal people are restricted due to many active terrorist organizations in the border areas. The terrorist organization collect tolls from the local inhabitants and communal riots are common between the tribals and settlers. At present, it is extremely difficult for law enforcement agencies to reach the remote and inaccessible areas which are exploited by terrorists and local politicians. Even the inaccessible areas are used as training grounds by terrorist organizations and criminals. Border roads and associated link roads will enable law enforcement agencies to reach these places quickly. The people living in these areas will be better secured and government control will be established.⁹

Figure 6: Police Enforcement of Law & Order Situation in the Border Areas



Source: Author's self-collection

Challenges and Mitigation Measures in the Implementation of Border Road

Important measures are briefly highlighted below:

Security Issues:

a. Challenges:

Unguarded and Unprotected Border: There is a good chunk of border areas, especially along the Myanmar border, that is not yet guarded or controlled by BGB or any other agencies. From BP 71 onwards towards the north for about 30 km or so, Myanmar Army has deployed along the border instead of the border guard force of Myanmar. No of BOPs are very less along this border. Maximum BOPs are 2-4 km away from the borderline and there is no BOP from BP71 to BP 2364.

Unauthorized Obstacles along the Border: IEDs, mines and other innovative obstacles are placed in many places along the border line both by Myanmar Army and miscreants.

b. Mitigation:

First, the survey of Bangladesh needs to take necessary steps to demarcate and put in border pillars in coordination with its counterpart. Second, both the ring road and the link road may be built mainly to enhance the operational abilities of security and law enforcement agencies. BOPs are to be constructed within 50 to 300 meters from the IB along the ring road. Third, the establishment of the ring road and link roads along the IB will facilitate the establishment of permanent or temporary operation bases, logistic bases, airfields, or other military installations of operational value. Finally, border roads may be built in a way that plays a vital role in dominating the surrounding area. Both sides of the road may be dominated and the visibility may be clear for observations. Special focus may be given on the border side so that the visibility will clear up to 2-3 km towards the border.

The Attempt of Extortion by the Miscreants:

a. Challenge: There may be several attempts of extortion by the miscreants from the construction sites of the border roads. Besides, the possibility of abduction of the civil workers by the miscreants may also remain open.

b. Mitigation: First, the ECB may have adequate manpower to ensure the security of some of the construction sites. Second, nearby camps of the Army and BGB may provide security for the construction sites. Third, nearby Police Stations/posts may be coordinated to provide security for the construction sites.

Other Challenges and Mitigations: Few other challenges and mitigations related to the construction of border roads are appended below:

- a. Construction of border roads may require huge land which may include tribal paras and cultivable land. This may create communication among the local people. ECB may take some community development projects for the affected parts/people to defuse the commotion.
- b. Rough terrain features may create severe difficulties in shaping up hills and constructing roads in this region. Detail reconnaissance and adequate preparation may be needed by ECB.
- c. Unpredictable weather conditions and the long duration of monsoon may hamper construction work. ECB will consider this unforeseen situation in the overall construction plan.
- d. Hills and mountains in this area are mostly made of soft mud (not made of rock) which may cause frequent landslides during monsoons. ECB will consider this factor while constructing border roads.
- e. Construction of border roads may need continuous maintenance support. As such, the required number of ECB camps may be established along the road with dozers, dumpers, stone crushers, etc. The ECB camp will also have some required equipment to utilize in case of landslides and flash floods.
- f. Border roads may have a proper drainage system to protect the hills from erosion/landslides during the rainy season.
- g. Border roads may ensure power supply and water supply to the remote areas of CHT.
- h. Mobile networks may be enhanced in remote areas by establishing necessary network towers along the road. Bangladesh Army may establish its mobile network in this area to have secured communication.

Conclusion

The Government of Bangladesh has taken the initiative to build a border road in the CHT area and gradually cover the other parts of Bangladesh. Border roads will improve the interconnectivity within the region. The ongoing border road may allow the SFs to dominate the entire area more frequently and effectively. It may also permit the conduct of various military activities including the establishment of checkpoints. Domination along the border may increase ensuring the security of the people living on the border. It may also restrict the infiltration of exotic groups. Therefore, the border roads will ensure the overall security of the southeastern region of Bangladesh. Border roads may facilitate the marketing of various agricultural products, aquatic

products, animal products, etc, thereby enhancing the business of the area. The living standard of the people may improve. It will also create easy access to education, health, and various social needs. It may facilitate easy movement of the tourist in the region. Therefore, the border roads may have a significant positive socio-economic implication for the local inhabitants. The construction of border roads may boost the tourism sector in the area. It may attract the tribal people to live along the road. It will also attract a few tribal families to come across the border to live along the newly constructed road. As a result, the demography of the area may change. Tribal people may dominate all important communication hubs, tourist spots, business centres, etc. along the border road. Therefore, considering the above factors, preplanning is required to empower the deprived Bengali community by employing/settling them in some tourist points, business centres, etc. to maintain the stability of the demography.

At present, the BOPs of CHT are located a little away from the border. The gap between the BOPs is also more than customary. Visibility between the BOPs is also restricted. The link road may enable the BOPs to observe every piece of land effectively, thereby enhancing the overall security of the border. The link road may facilitate the establishment of BOPs within 50 to 300 meters of the IB. At the same time, the link roads may facilitate the carrying of materials for the construction of the BOPs along the border. It may reduce the movement of miscreants in the area and increase employment opportunities for the local people. Border roads may open new opportunities in the economic and business arena in CHT due to natural resources and undiscovered minerals. Some of the strategically important places like the border tri-junction may turn into a business hub. Considering the external and internal security threats, dominance over the region by SF is equally important and needs to be coordinated during the construction of the border roads.

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Brief Biography



Lieutenant Colonel Sarker Md Iqbal Hossain, psc was commissioned from Bangladesh Military Academy with the 36th BMA Long Course in the Corps of Engineers on 12 June 1997. He is a graduate of DSCSC, Mirpur. Apart from mandatory courses, he accomplished his BSc in Civil Engineering from MIST. During his career, he served in a good number of units and institutions of the Bangladesh Army in different capacities. He also served as Instructor Class “A” in the Engineering Faculty of Bangladesh Military Academy (BMA). He participated in the United Nations Peacekeeping Mission in Sudan with humanitarian demining and in South Sudan with Bangladesh Engineer Contingent. Presently, he is serving as the Staff Officer (Planning) of Headquarters 34 Engineer Construction Brigade, Dampara, Chattogram.

Study of Symmetry and Asymmetry in Indo-China Relations Post-2020 and Future Options

Squadron Leader Abhishek Tripathi, psc, IAF

Abstract

India and China share a long history of civilizational exchanges. However, the relationship between India and China nose-dived in 2020 due to the Galwan incident. The foreign relations between India and China has both regional and global implications because both are key stakeholders in Asian and world geopolitics. Given this, it becomes imperative to analyze the interaction of the two states for highlighting the complexities of their strategic dynamics. This would enable to suggest of options for resolving future crises and facilitate sustainable peace. During the research, the large-N method for sample collection through surveys and data from international institutions was carried out for statistical analysis. The qualitative analysis of reference text along with interviews was also incorporated. Parametric analysis reveals that both India and China are proportionally attentive and have balanced exposure for dyadic interaction. A sense of systemic misperception exists between both countries with disjunctive interests. The exposure and misperception between the two countries increased due to global construct and geopolitical scenarios. For the solution to the crisis, both sides must refrain from any coercion and aggressive posture. Moreover, economic interdependence and trade as ‘soft power’ can play a positive role in thawing the existing situation with positive engagement if the channels of diplomatic rituals are again established.

Introduction

India and China are neighbouring countries in Asia sharing a very unique relationship wherein both share a long history of civilizational exchanges. However, the foreign relations between the two countries have not been harmonious in modern times. There was a Sino-Indian war in 1962 followed by several border skirmishes. The relationship further nose-dived when a military confrontation occurred in the Galwan Valley in June 2020 resulting in casualties on both sides. The situation is yet to normalize to pre-2020 status and the future seems to be grim as the mistrust and misperceptions have only increased between both sides.¹

The foreign relations between India and China has both regional and global implications as both are key stakeholders in Asian geopolitics and are emerging nations on the world stage. Given this, it is important to analyze the interaction between the two states to understand the complexities of their strategic dynamics. This

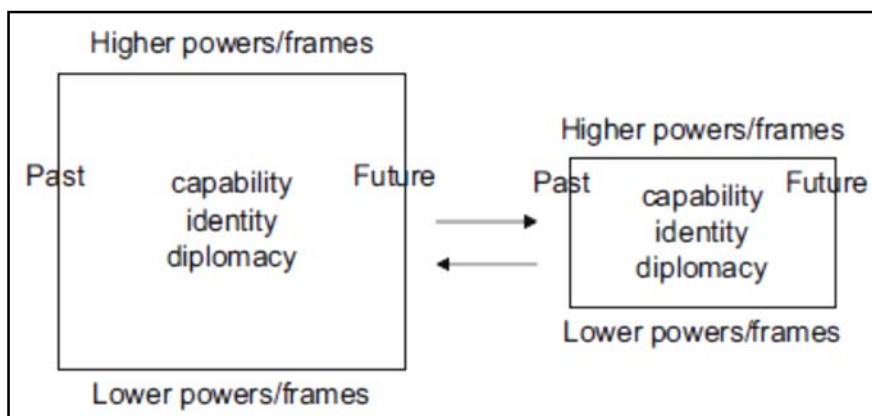
would enable to suggest of options for resolving future crises and facilitate sustainable peace. According to the asymmetric theory of International relations, the disparity is defined in parametric value as 'clear' when a large one exceeds the smaller one by half, it is 'great' once the difference is twice, and 'overwhelming', if the difference is ten times. Further, 'Misperception' is defined as a cluster that includes 'misunderstanding' and 'misinterpretation.' 'Misunderstanding' implies misperception of intent, and 'misinterpretation' implies misperception of meaning. Something that is 'misleading', which tends to produce misperceptions.

This paper aims to analyze Indo-China strategic relationship from the perspective of the asymmetrical theory of international relations and provide future options to resolve the crisis.

Analysis of Relationship between India and China Based on Basic Structure of Asymmetry

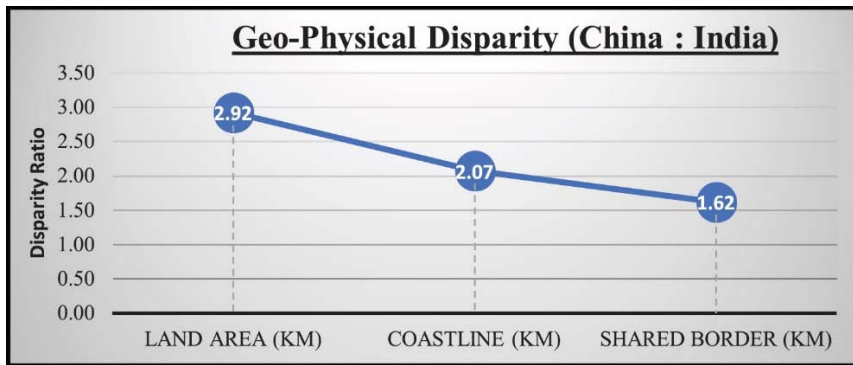
The basic framework of asymmetric analysis consists of disparity modelling based on comparative analysis of parameters like 'Context', 'Identity' and 'Capabilities' to access exposure of two countries or dyads in a bilateral relationship. These parameters are further composed of subdomains. Any relative change in these factors affects the dynamics of bilateral relationship.² Figure-1 depicts the basic structure.

Figure-1: Deep Structure of Bilateral Asymmetry



Source: Author's self-construct

Disparity modelling of Context: The 'Context' consists of geolocation, distance, shared interest, and historical perspective with respect to interaction between two countries. The geophysical comparison of China and India is depicted below:

Figure-2: Geophysical Disparity Ratio of India & China

Source: World Bank data

- a. **Locatedness and Shared Interest:** The proximity and shared interest shape the outlook and the attention both countries tend to provide each other. India and China are neighbours and share overlapping interests in South Asia, Indo-Pacific, and the Central Asian Republics (CAR). Both nations are key players in the emerging world order which shapes their dynamic interaction.³
- b. **Historical Perspective:** Foreign relationship between the two countries has not been harmonious in modern times resulting in the Sino-India War of 1962. It was followed by several border skirmishes. Nevertheless, there have been centuries-long cultural and transactional exchanges between the two countries.⁴ The outlook of both of them has been shaped by their previous experiences.
- c. **Diplomacy:** Chinese diplomacy has been attentive towards the Indian context. The diplomatic channels have been long established between the two countries and the bilateral ties are stressed by nations' leadership.⁵ Further, Indian domestic politics and diplomacy are equally attentive toward China.⁶

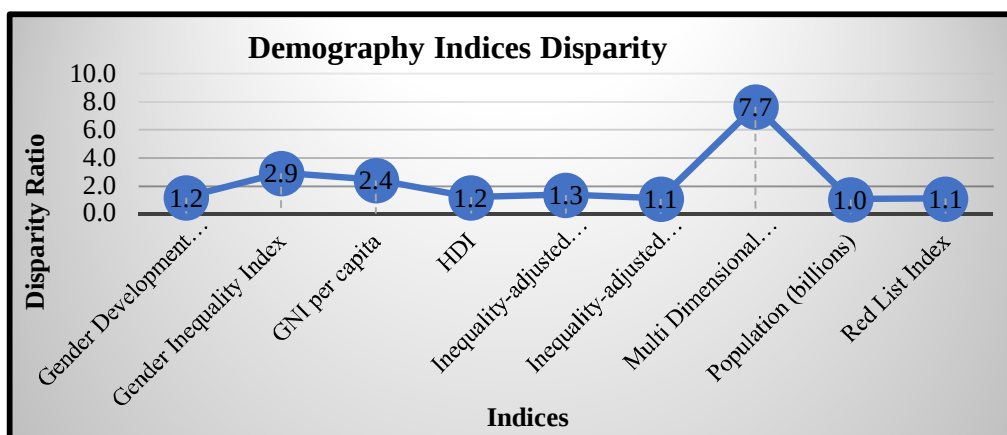
Analysis of Context Disparity Modeling: The analysis of parameters of 'Context' modelling reveals the following points:

First, India and China share physical proximity hence, both will fall under the attention sphere of each other and it is unlikely that they can ignore each other. It influences their outlook with respect to the formulation of foreign policies. This mutual interaction implies relative exposure to each other. Second, China is the larger actor in dyadic interaction with Significant Asymmetry in its favour because of its greater span. The diplomatic channels that exist between both states and domestic politics influence the shaping of their foreign interactions and policies. Hence, any change in domestic issues is likely to impact the foreign policy of both nations and

also vice versa as the strategically right policy will strengthen domestic credibility as well. There is no indication of asymmetry at the diplomatic level.

Disparity Modeling of Identity: Identity refers to the national identity of the nations. It consists of demography, asymmetric attention and status of autonomy within the relationship. Demographic analysis of both countries has been carried out based on United Nations Human Growth Index (UNHGI). The disparity ratio of the demographic index is as follows:

Figure-3: Disparity Ratio of Demographic Indices between India-China



Source: Author's self-construct

Asymmetric attention deals with the notion that the smaller side is more cautious about its responses, and the larger side may not give that much importance to the relationship. Due to geographical proximity, India and China have a “Neighbour effect”, *i.e.*, they will be part of each other’s strategic attention. China being the larger actor has occupied significant attention from India; however, India has also started featuring quite prominently in the attention sphere of the Chinese strategic thought process and Sino-India relations were elaborately emphasized in the Chinese Annual Report of 2016.⁷ Further, Chinese foreign policy is also attentive towards the Indian interaction and considers India as a key variable in their global construct.⁸

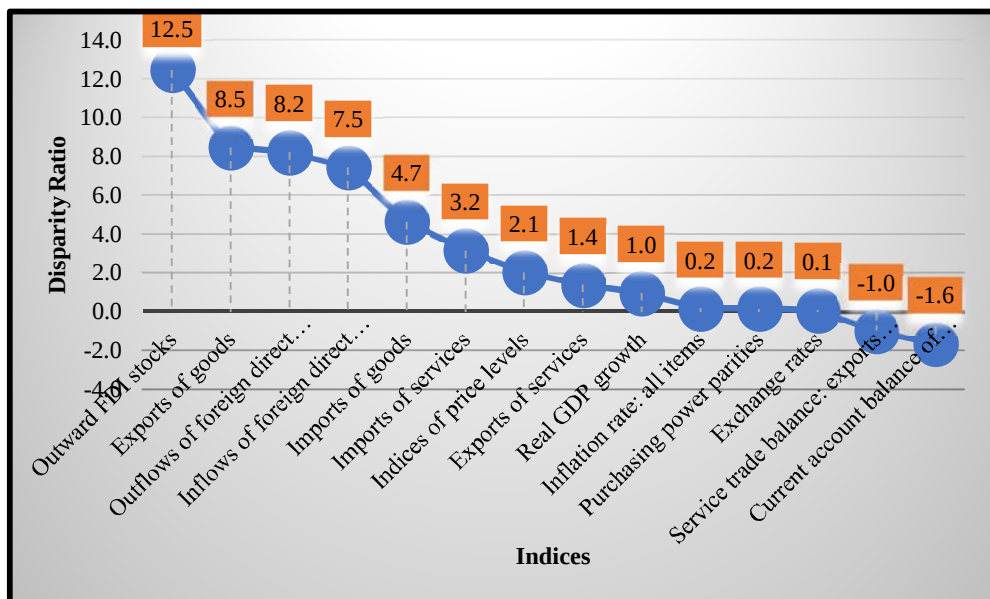
Autonomy refers to the acknowledgement of sovereignty and identity by both sides; however, under the realm of asymmetry, larger actor expects deference from the weaker side. In Sino-India relations, the Autonomy hold the most significant position for India, and the Indian approach is cautiously inclined towards the assertion of mutual respect and balancing rather than deference.⁹

The analysis of parameters of ‘Identity’ modelling reveals the following points:

First, out of nine parameters of demographic indices, there is significant asymmetry for only three indices and the rest parameters do not depict even clear asymmetry. Further, there is symmetry in terms of population, and data reveals that the availability of the population reaching active labour force will favour India in terms of asymmetry.¹⁰ Second, the attention China draws from India is significant; however, a recent trend reveals that both sides are attentive towards each other in dyadic interaction. Therefore, the case for asymmetric attention cannot be established. Third, India is seeking respect for the acknowledgement of autonomy on equal terms and implying that bilateral relations will not be pre-committed under perceived asymmetry. It has to be on equal footing with mutual respect rather than deference.¹¹

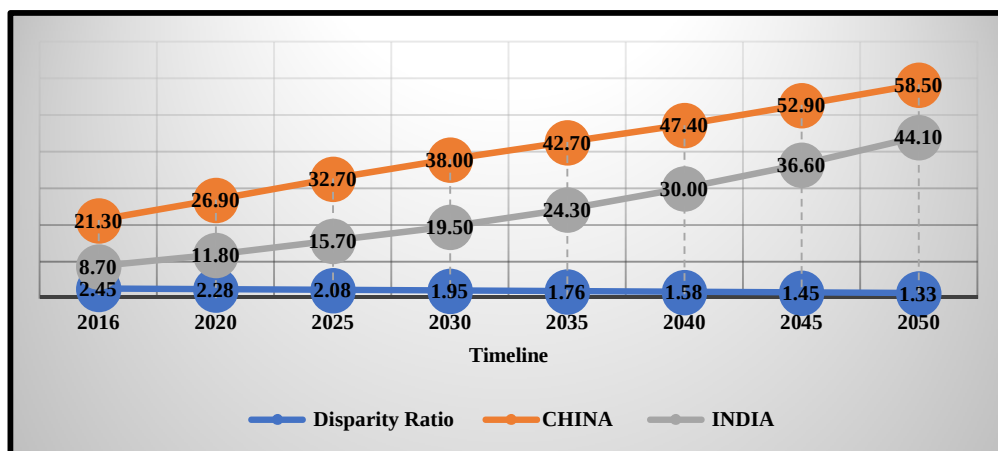
Disparity Modeling of Capability: Capability includes a comparative analysis of materialistic or hard power tangibles like the military and economic potential of the actors involved. Figure-4 depicts the disparity ratio of major economic and financial parameters based on the data set of the Organization of Economic Corporations and Development (OCED) and the World Bank. Subsequently, Figure-5 depicts the economic projection of both nations based on the World Bank and IMF dataset as published by Price Water Cooper (PwC) auditing firm for the next thirty years.

Figure-4.: Disparity Ratio of Economic Indices of India-China



Source: Author's self-construct

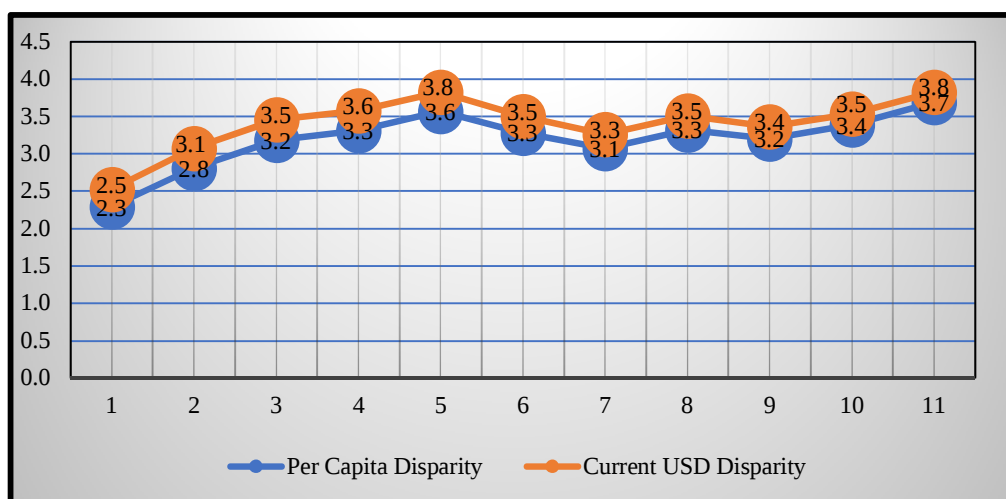
Figure-5: Economy Projections of India-China for the next 30 years



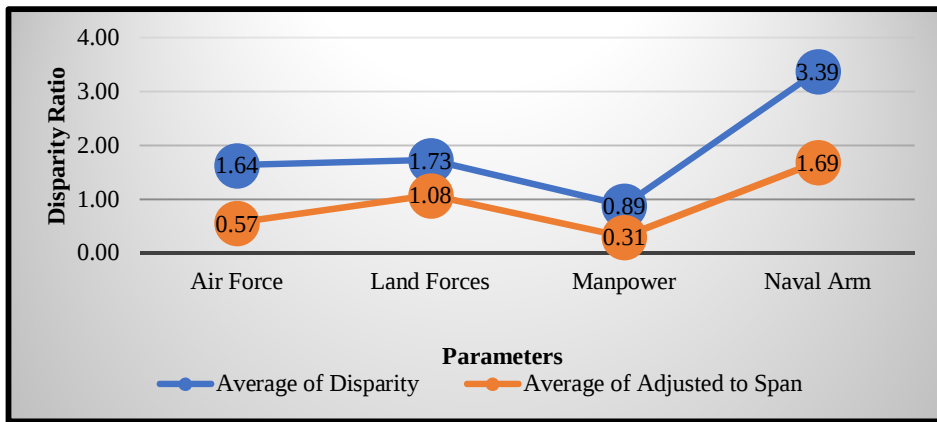
Source: Author's self-construct

The data set collated from Stockholm International Peace Research Institute (SIPRI) has been modelled to find out the disparity in military expenditure between the two nations over the span of eleven years (2011-2021). Figure-6 depicts the relative trend and disparity in terms of Current USD and per capita disparity. Data is collated from Global Firepower Index concerning armed forces equipment and capability to access disparity in terms of tangible hard power. The figures were then adjusted with the span scale i.e geographical span of the country over which the force density has spread with a respective service commitment. The ratios are shown in Figure-7.

Figure-6: Disparity Ratio in terms of Annual Military Expenditure



Source: Author's self-construct

Figure-7: Disparity Ratio for Military Hardware in India and China

Source: Author's self-construct

Both India and China suffer from security dilemmas and their geopolitical sphere of influence also converge in Indo-Pacific and Central Asian regions.¹² India is a significant factor in China's security assessment concerning the Indo-Pacific region and Indian policies have impacted the Chinese geopolitics and strategic goals like that of the Belt and Road Initiative (BRI). The data survey carried out in China also confirms that security threat perception for China from India has only increased over the years and has doubled since 2014.¹³ Further, it is being observed that in case of military conflict, India enjoys substantial geographic and maritime advantage, and exposed supply lines of China in the Indian Ocean will be key concern.¹⁴

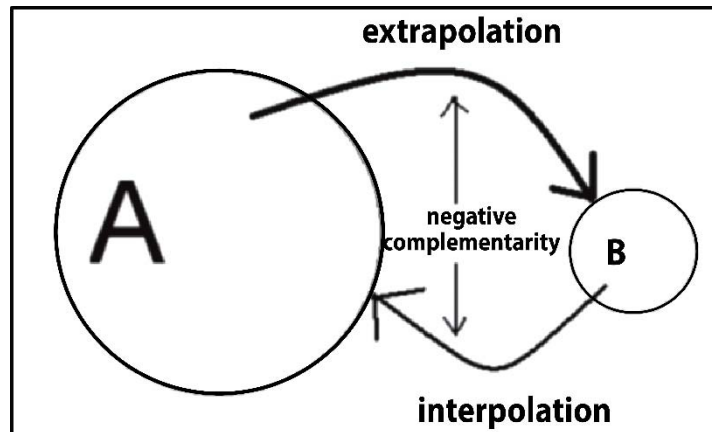
Analysis of Capability Disparity Modelling: The analysis of parameters of 'Capability' modelling reveals the following points:

First, the data reveals that China has favourable asymmetry in terms of economic indices which range from overwhelming disparity for FDI stocks to significant disparity for the overall size of the economy. However, forecasting estimates of the economics of both countries reveal that the disparity ratio has a declining trend, and it is likely to reduce from Significant to Clear disparity within eight years. Second, the modelling of military capability reveals that there is a clear disparity in terms of absolute figures; however, once it is adjusted with geographical span to ascertain the density of force projection then military capabilities can be deduced to be symmetric. Further, both nations are recognized nuclear states, and nuclear deterrent has a symmetric effect on capability.¹⁵ Finally, there are indications that both sides feature upon each other's security assessment for analyzing threats. Both perceive each other to be capable enough to affect strategic interests and overall security and also accommodate each other in their threat perception.¹⁶ Hence, asymmetry in terms of security cannot be established.

Analysis of Systemic Misperception and Conflicts between India and China

‘Systemic Misperception’ in asymmetric theory emanates from the difference between perception and the reality that is supposedly perceived. Herein, both intent and meaning have differential comprehension about each actor which misleads to certain actions. The misleading actions again lead to misperception, and it becomes a vicious cycle.¹⁷ The diagram below depicts the basic illustration of systemic misperception.

Figure-8: Diagram for a Pattern of Asymmetric Misperception

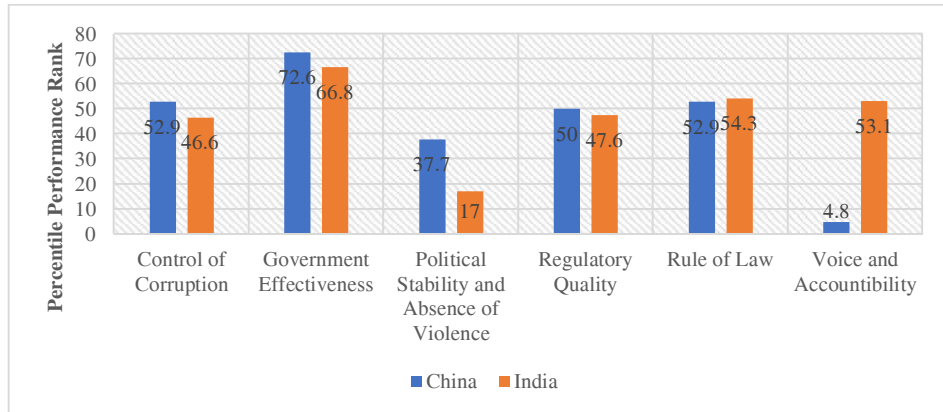


Source: Author's self-construct

Misperception in India-China relationship (Historical): There have been several issues between India and China out of which border disputes, asylum to Dalai Lama, and more recently trade deficit has been significant.¹⁸ The foundational source of this mistrust can be traced to the worldview both nations have as they have a different conception of the international world order and their perceived role in it.¹⁹

Comparative Analysis of Political System: India is a democracy based on a parliamentary electoral political structure emphasizing upon creation of a welfare state based on democratic ideals.²⁰ China is a ‘One-Party’ state conceived on socialistic ideology dominated by the Chinese version of communism.²¹ The World Bank Institute data on Worldwide Governance Indicators (WGI) in Figure-9 shows that comparative ranking is relatively symmetrical. It is evident that the political structures of both countries are different owing to different political and ideological values. There is a fundamental problem of relations between states with different political systems and this political distancing may provide a path to move disagreement from challenges to conflict.²² This political differentiation creates political disjunction which adds to the dimension of potential suspicion and misunderstanding.²³

Figure-9: Percentile Performance for both India and China for Governance Indicators



Source: Author's self-construct

The Novelty of Leadership Changes: The novelty of leadership changes may stir the existing situation and may act as a catalyst for increasing concern for either side. India had a leadership change in 2014 wherein Narendra Modi has come into power and likewise, Xi Jinping became President of the People's Republic of China. Both leaders are considered to be nationalistic and may result in the renewal of the rivalry between the two states. Further, the foreign policies of Modi and Xi Jinping are in variations from their predecessors.²⁴

Novelty Mismanaged: The newly introduced leadership change if mismanaged, may lead to confrontation. The rise of India and China has a complex overlapping geopolitical entanglement with competition thereby increasing cooperation and also strategic diversification.²⁵ This novelty in the existing paradigm has changed the contours of India-China dynamics which may have reinforced the cycle of mistrust.

Asymmetric Hostilities: In bilateral relationships, the hostility is a downward slope as the interaction between two sides is re-casted as a zero-sum game. After the Doklam clash of 2017, there are negative impressions on the Chinese perception that the heavy-handed politics of Modi's government towards China will make things difficult and strategic conflict seems inevitable. Further, India features among the bottom three countries that are not having good relations with China other being the USA and Japan.²⁶

a. **Small or Limited Wars:** The asymmetric hostilities may lead to 'small or limited war' by the larger actor to progress some interests, and persistence from the weaker side may lead to a stalemate but either side cannot finish it unilaterally. The Sino-India War of 1962 can be cited as an example. The

agenda of the larger player would be to teach the weaker side some lessons. Hence, the likelihood of getting engaged in war with India is a real possibility from the Chinese perspective as India features as the second most probable country only superseded only by Japan.²⁷

b. **Stalemates and Coercion:** Galwan conflict of 2020 has been a flash point in India-China relations. The situation of stalemate is continuing on the Ladakh region of India. Galwan conflict was neither normal nor accidental and even though two countries and it can be construed as a coercive manoeuvre of China.²⁸

Negative Complementarity: The existence of misperception is only amplified by the instances of negative complementarity. The dynamics between India and China show ambiguity in terms of physical, diplomatic and economic terms. Economic dependence upon China is so great that trade relations between the two countries reached an all-time high in 2021.²⁹ At the diplomatic level, Chinese foreign minister Wang Yi said that India-China ties have shown a momentum of recovery. On the contrary, military buildup in the border area has been observed along with instances of fighter aircraft flying near LAC which further escalated the tension.³⁰ Such relative ambiguities deepen mistrust and exacerbate the crises.

Effect of Regionality and Multimodality on the Relationship between India and China

Isolationism: India and China have international ties and these interrelationships with other actors play a significant role in shaping their dyadic relationship. The effect of these foreign relationships and the sphere of interests that both India and China have in the South-Asia or world is such that both countries are exposed to the effects of each other and cannot be treated in isolation.³¹

Regionality: In case of great and overwhelming disparity between the nations, issues can be resolved through negotiation under the premise of inclusive leadership by the dominant player. However, things become more complex if the players involved happen to be a “Pole” in a multipolar world. India is a pole in six polar world-matrix. Further, India is a regional power in South Asia, and this distinction makes India a different player in the sphere of influence that China has on other Asian nations.³² The regionality amplifies the notion of autonomy and in case of contradiction may add up to misperception. Given this, any coercion measure or aggressive norms would destabilize the situation as it would be considered by other smaller players of the region as non-acceptance of the special role of regional power in the region.

Relationship under Global Construct

China-India-US Triangle: Rise of China, especially after 2008, on the world stage is construed as a challenge towards the US interests. The US is a major part of Chinese strategic concerns and also figures to be a major threat to Chinese national security.³³ In recent times, it has been observed that Indo-US ties are deepening, and both of them are evolving as strategic partners. Hence, the overall scenario is forming a geopolitical triangle of US-China-India which adds a dimension of asymmetry and misperception between the two states. The presence of the US is a destabilizing factor between India and China.

The Other Triangle (Russia-India-China): India and Russia share a strategic bilateral partnership, and Russia considers India as an equal partner in international affairs.³⁴ Russia-China ties have also improved over the years, and it can be assessed that ties between both countries have achieved a qualitative strategic depth.³⁵ Russia-China and India are part of the RIC dialogue. Recently Russia stressed the importance of strengthening the functional and institutional framework within RIC. Therefore, RIC gives flexibility to Russia to remain neutral or act mediator in Indo-China affairs to exercise friendly persuasion and restraint.³⁶ It can be inferred that Russia has stabilizing effect on Indo-China relations

Security Dilemma: India and China have been part of each other's security dilemma. Therefore, the formation of any alliance with other nations would exacerbate the situation. The US, Japan, Australia and India are members of the Quadrilateral Security Dialogue (QUAD). It can be seen as a collaboration between four democracies with shared threat assessment from China. Although, India has maintained that QUAD is intended for free, open and inclusive growth of the Indo-Pacific region. However, the Chinese perception of this QUAD and Indo pacific framework is that it is intended solely to contain strategic interest and growth of China and is akin to Asian NATO.³⁷

Soft Power and Economics: Countries have adopted "Soft Power" as a tool to shape their strategic interaction on a global stage and in the process may seek compliance from others.³⁸ This application of soft power can be an alternative to hard power that can be exercised by states to manage asymmetrical relationships. China and India both have the capacity to deploy soft power and the same will definitely be one of the factors that will shape their foreign policy.³⁹ As the two fastest-growing economies, both countries can take advantage of each other because of spatial proximity.⁴⁰ Since domestic politics plays a significant role in the formulation of Indian foreign policies, it can be deduced that soft power can be employed for managing Indo-China ties. However, the effects and implications may be symmetrical in nature.

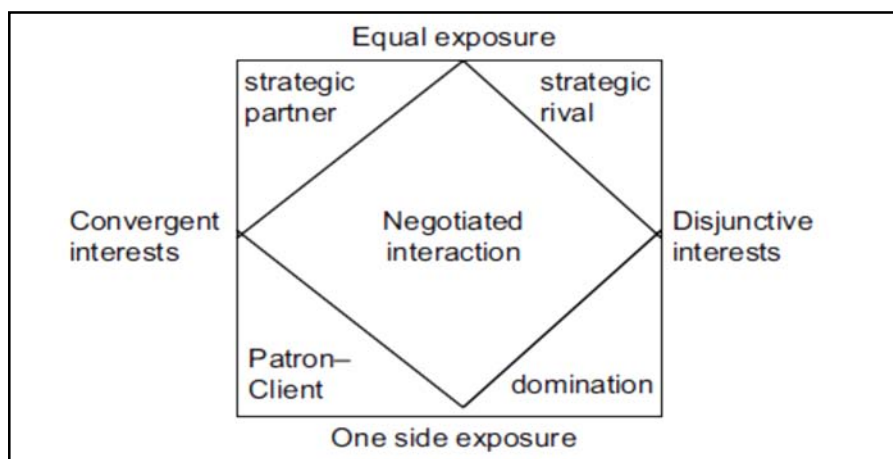
Conclusion and Recommendations

Based on the above discussions and analysis for disparity modeling, it was found that the case of asymmetry can be accepted only for Geophysical and Economy out of eight parameters. The other six parameters were found to be symmetric. Further, India is a regional power and this dimension adds complexity to the relationship which is further compounded by the existence of any third player in the relational triangle. This exposure and misperception increase due to external geopolitical scenarios. Therefore, it can be inferred that India and China are proportionally attentive and exposed to each other in dyadic interaction.

As far as the evidence of ‘Structural Misperception’ between two nations is concerned, all seven indicators namely historical, polity, leadership, mismanagement of novelty, small & limited wars, coercion, and negative complementarity points towards the existence of structural misperception along with disjunctive interests and differing views for a global order of both countries.

The field of asymmetric interaction between countries can be classified by the framework depicted in Figure 10. From the above paragraphs, it is clear that the India-China relationship is falling in the domain of equal exposure and disjunctive interests; therefore, both of them can be classified as “Strategic Rivals.”

Figure-10: Asymmetric Interaction Classification



Source: Author's self-construct

The state of conflict between the two countries is characterized by certain markers like parties, issues field, tensions, actions and the existence of a crisis. Further, the existence of territorial disputes increases the probability of military conflicts or the use of force. The analysis of markers for India and China relations is as follows:

Table-1: Summarizing Conflicts Characteristics

Ser	Marker	Characteristics	Indo-China Relations (Research discussions of previous paragraphs)
1	Issue	Disputes, Zero-sum situations	Border Disputes (Historical Perspective) Tibet issue (Historical misperceptions)
2	Tension	Attitudes and Predispositions	Distrust and Suspicion (Security Dilemma)
3	Actions	Propagandist, Military threats Commercial	Military build-up at LAC, Border skirmishes (Asymmetric Hostilities) Trade Deficits (Economics)
4	Crisis	Sudden eruption of unexpected events	Galwan Incident (Coercion & Stalemate)

Source: Author's self-construct

From above, it is vivid that a state of conflict/crisis is existing between India and China. The state of conflict may result into heighten the level of threat, coercion and use of force. Empirical studies also reveal that a dyad involving relatively equal states tends to depict escalatory patterns for the level of coercion in successive crises and leaders will be relying upon a more realist perspective leading to difficulties in resolution. Since both countries are emerging powers having strategic stability due to nuclear deterrence; therefore, there is less likelihood of direct war. Hence, the existing state of stalemate may continue with the likelihood of increased frequency of confrontation using force in future. Given this, the conflict or crisis between India-China needs to be managed if it cannot be resolved.

In the case of international conflicts, any crisis/conflict mostly culminates into six outcomes. The analysis of all these case scenarios concerning India-China relations is as follows:

Table-2: Case Scenarios Analysis

Ser	Outcome	Characteristic	Remark based on Analysis	Probability of Conflict Resolution
1	Avoidance	Forgoing interest to maintain friendly relations	1. Indian approach is cautiously inclined the assertion of mutual respect and balancing rather than deference. 2. Novelty of Leadership change is unlikely to show change in stance.	Unlikely

Study of Symmetry and Asymmetry in Indo-China Relations...

Ser	Outcome	Characteristic	Remark based on Analysis	Probability of Conflict Resolution
2	Conquest	Decisive Military Victory	1. Both countries are recognized nuclear states and has symmetric military capability.	Unlikely
3	Submission / Deterrence	Effective Coercion of forced submission under viable treat	1. Both side are vulnerable to each other proportionally and also accommodates each other in their threat perception. 2. Any coercion measure or aggressive norms would destabilize the situation.	Unlikely
4	Compromise	Both sides withdraw from initial position, demands or actions	1. Crisis can be resolved via negotiation. 2. Soft power can be employed for managing ties.	Most Likely
5	Award	Achieving settlement through an external impartial third party	1. Relations with other players may exacerbate the existing misperception and security dilemma within relations.	Unlikely
6	Passive settlement or complete coexistence	No formal outcome parries % accepting new status que	1. Situation of Stalemate is existing between the two parties. 2. Diplomatic channels and stabilizing factors have collapsed between India and China	Likely

Source: Author's self-construct

It is evident from the above analysis that, out of six possible scenarios only two outcomes namely, Compromise and Passive Settlement are having likelihood to resolve the crises. Given this, specific recommendations for the management of conflict/crisis are as follows:

First, both sides must refrain from any coercion or aggressive measures to facilitate the stabilization of the situation and confidence building. Second, positive engagement can only happen if the channels of negotiations are opened and diplomatic rituals are again established. The public opinion polls carried out testify to the fact that negotiations can help to resolve or manage crises. Third, economic interdependence and trade relations can play a significant part as 'Soft-power' in thawing the existing situation. The trade engagement between the two countries is already flourishing and the same may be leveraged as the foundation for positive engagement. Empirical evidence also suggests that economic incentives can facilitate

rivalry termination. Finally, the inclusion of any other state, external actors or alliances can increase the misperception and amplify the crisis. Therefore, only bilateral engagements are advisable for trust-building measures.

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Brief Biography



Squadron Leader Abhishek Tripathi, psc was commissioned in the Aeronautical Engineering Branch (AE) of the Indian Air Force on 02 July 2010. He is a graduate of DSCSC, Mirpur. The officer is trained on the Mirage-2000 aircraft of the IAF. He has previously held the appointment of Officer-in-Charge of the flight line of a fighter squadron and the second line servicing bay of a fighter base. He has served as Command Engineer for the fighter fleet managing various maintenance aspects and project implementations for bases under command. The officer received Air Officer Commanding-in-Chief commendation in 2017. Apart from mandatory courses in his professional career, he holds Masters of Technology (M. Tech) Degree with distinction in Aeronautical Engineering with a specialisation in Guided weapons from the Defence Institute of Advance Technology (DIAT), Pune. He has project experience in the investigation of aircraft accidents with the application of data analytics and machine learning. Further, he completed his Masters of Arts (M.A) in Political Science and International Relations from Indira Gandhi National Open University (IGNOU).

Restructuring the Operational Activities of Bangladesh Navy to Enhance Proficiency of its Personnel: A Feasibility Study

Lieutenant Commander Mohammad Pranjol Islam, (G), psc, BN

Abstract

Bangladesh Navy (BN) is the prime organization that protects the territorial integrity of Bangladesh in the maritime arena. With the advent of technology, hybrid threats, laws, and regulations, BN needs to perform a variety of multi-dimensional tasks to safeguard national integrity at sea. To keep up with the fast-changing threat environment, BN needs to enhance the proficiency of its personnel. However, due to various challenges and difficulties, the efficiency of the personnel on-board ships suffers adversely. This research was undertaken to restructure the operational activities of BN to enhance the proficiency of its personnel. During the course of the research, various interviews, focus group discussions, official document reviews, book reviews, and an online survey were carried out to find out the challenges and their impacts on the BN personnel. Various methods of restructuring operational activities were also deduced by various SMEs through KIIs which can help enhance the proficiency of the personnel. As such, various benefits of restructuring the operational activities were also discussed. The findings were reorganized as qualitative and quantitative data and were analyzed through the SPSS software to check their validity. Through the analysis, it was found that restructuring the operational activities could positively enhance the operational activities of BN and few suitable changes were recommended.

Introduction

Bangladesh Navy (BN) is a mid-sized offshore defence navy having a three-dimensional capacity comprising aircraft, submarines and surface fleets.¹ The Bay of Bengal (BoB) is of vast importance to Bangladesh (BD) as ninety per cent of its trade ply through it. BN is vested by the government in safeguarding national maritime sovereignty and integrity.² The modern threat environment also poses a massive security challenge to the navies operating at sea.³ Hence, BN needs to carry out its operational activities efficiently through its personnel to fulfil the various military, constabulary and benign roles. The personnel on board the ships require a specific set of professional skills to efficiently perform the roles of BN.⁴

BN ships deployed at sea are tasked with various operations, duties and missions. To keep up with the changing threat scenario and the technological advancements, the

personnel need to develop their proficiency. Even after providing necessary training, sufficient sea trips, and conducting various exercises, the standard of proficiency is not up to the desired expectation of various commands. A few pertinent problems were highlighted through the findings of the research. Hence, these problems need to be mitigated if BN targets to achieve its goal of becoming a truly efficient and professional navy. Thus, the research will endeavour to highlight solutions to this problem by restructuring the operational activities of BN to enhance the overall proficiency of the BN personnel.

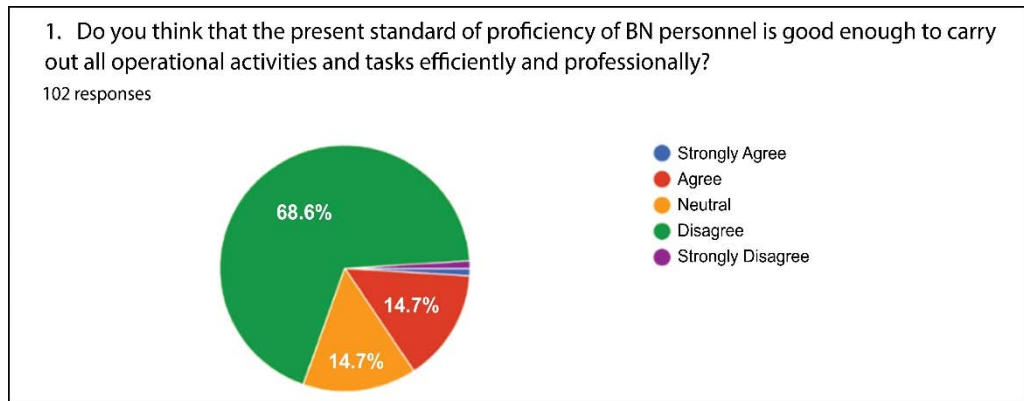
This paper is an abridged version of the main research which aimed to correlate the relationship between changing the operational activities of BN with enhancing the proficiency of its personnel. By the research problem, the alternate hypothesis developed was “Restructuring the operational activities of BN will enhance the proficiency of BN personnel”. The null hypothesis was “Restructuring the operational activities cannot enhance the proficiency of the BN personnel”. The research was causal and tried to find the relation between two variables to deduce whether restructuring the operational activities will enhance the proficiency of the personnel of the BN.

Evaluation of the Present State of Proficiency of BN Personnel onboard Ships

The proficiency of men is not quantifiable; however, a few commands opined that proficiency can be deduced by the level of professionalism the men possess, their application of theoretical knowledge on the ground, their conversancy with weapons and sensors, acquaintance with machinery and equipment, maintenance skill, conversance with SOPs and their working morale.⁵ They also opined that to achieve these traits, men require self-development, stress management and initiative to learn. Therefore, it is vital to understand the state of proficiency of BN personnel and similarly important to identify which aspects help develop proficiency in men.

A survey was carried out to understand and evaluate the present state of proficiency of personnel onboard ships. The officers who responded had substantial sea service and had undertaken vital sea appointments. So, it was assumed that the response they left was valid and correct. Furthermore, a Google survey was carried out where the majority of the respondents disagreed that the present state of proficiency of the BN personnel is not at par with the present operational activities of BN.

Figure-1: Percentage of Respondents on the Present State of Proficiency of BN Personnel



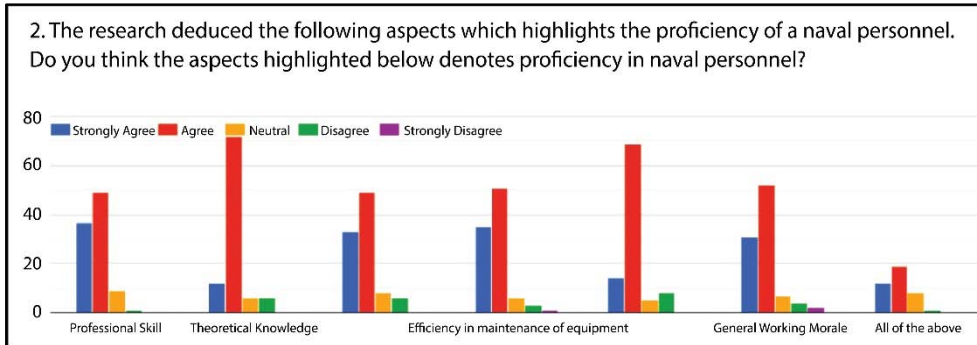
Source: Google Forms Survey

Determination of Proficiency of Personnel

The research highlighted a few pertinent criteria which may determine the proficiency of BN personnel. These are highlighted below:

First, professional skill enables the personnel to carry out their professional tasks efficiently. The skills enable the enhancement of the overall efficiency of the ship. The majority of the samples agreed that professional skill could be defined as a trait of proficiency. Second, without prior theoretical knowledge, the personnel cannot develop their professional skill. Hence, theoretical knowledge is vital for the personnel for their self-development of professionalism. Third, the BN ships are military platforms fitted with various kinds of weapons and sensors. The personnel on board must be conversant with various weapons and sensors to develop the readiness of the ship against threats. Fourth, the naval ships are fitted with sophisticated machinery and heavy equipment. As ships remain at sea, the person should have a high standard of efficiency in maintaining these machineries and equipment. Fifth, sophisticated machinery and equipment require SOPs to be operated correctly. The personnel need to have a high level of acquaintance with these SOPs to operate them correctly and increase ships' readiness. Sixth, life on board a ship is difficult and strenuous. The personnel need to overcome the exhaustive sea trips and keep high morale to carry out their tasks effectively. Hence, morale was considered to be a trait to develop proficiency. The majority of the respondents agree this trait is defined as proficiency.

Figure-2: Percentage of Respondents in Determining the Proficiency of BN Personnel



Source: Google Forms Survey

From the interviews with the SMEs and the survey, it is evident that the problem statement is acknowledged by the majority of the officers. The SMEs' opinions are significant as they have a substantial amount of sea service and experience which is a vital factor in the solution of the problem statement of the research. Most of the KIIs also agreed upon the significance of the problem statement and acknowledged that the problem needs to be addressed meticulously.

Challenges and the Impacts on the Development of Proficiency in BN Personnel

Deduced Challenges

Challenges to the Development of Proficiency: Various challenges discussed in the research are highlighted below:

Temporary Attachment Duties from Ships: Personnel posted on-board ships are frequently sent to temporary attachment duties away from the ships.⁶ These duties are normally prolonged which severely hamper the professionalism of the personnel.

Involvement in Ceremonial and Administrative Duties: As BN is growing in size and shape, hence, various ceremonial activities are conducted where a large number of personnel are required to participate and attend. The time away from the ship due to these ceremonies affect the professional development of the personnel. Sometimes the personnel are sent to do ORO duties from the ship.

Prolonged Maritime Activities in Adverse Conditions: The BoB is becoming rougher due to global warming and the BN ships face adverse seas frequently. The personnel suffer much due to sea sickness and motion sickness and cannot perform duties efficiently in this adverse condition. Prolonged presence at sea in

adverse conditions and any training given in this condition also hampers the development of proficiency in men.

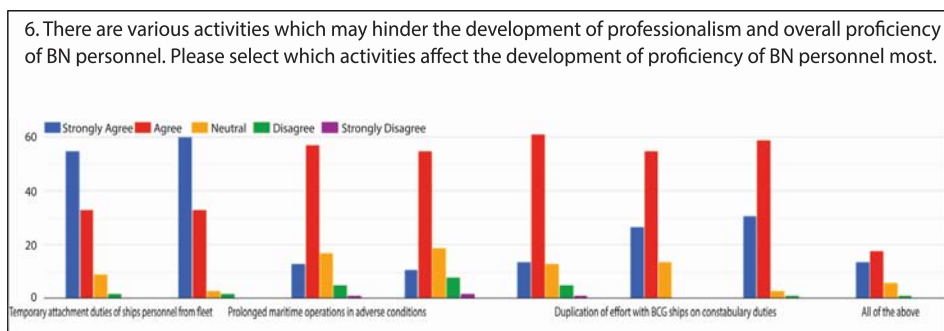
Combining Military Activities with Benign and Constabulary Duties: BN ships frequently carry out a combination of constabulary duties along with military duties. These combinations affect the personnel as they remain fatigued and cannot perform as per the standard requirement.

Compulsive Fulfilment of Underway Period and Anchor Period: As per Naval Headquarters directive, the ships at sea have to perform 60% patrol time and 40% anchor period. This compulsion creates a reluctance in men to perform their duties half-heartedly. This compulsion puts constraints on the commanding officers to perform flexibly.⁷

Duplication of Constabulary Duties with Bangladesh Coast Guard (BCG): BN performs constabulary duties along with Bangladesh Coast Guard (BCG) as it is having a smaller number of ships to perform its duties. Sometimes both organizations are sending ships to the same zones which is a duplication of effort. This duplication of effort reduces the working morale of BN personnel.

Training of Personnel in Fatigued State: Personnel normally tend to be fatigued during and after sea trips. However, intense and exhaustive training in a fatigued state does not develop professionalism. Various COs opined that the personnel cannot develop themselves while in a fatigued state. Hence, any training given in that state tends to be unfruitful for the personnel.

Figure-3: Number of Respondents on the Present state of Proficiency of BN Personnel



Source: Google Forms Survey

Impacts of the Challenges to the Personnel

The challenges highlighted above affect the personal traits of the personnel. The traits are highlighted below:

Extreme Fatigue: Extreme Fatigue after prolonged maritime activities at sea in adverse conditions affects the development of professional skills.

Inefficient Stress Management: Inefficient stress management due to involvement in ceremonial and administrative duties affects professional skill development.

Reluctance towards Training: Reluctance towards training due to the combination of military and constabulary duties reduces conversancy with weapons and sensors and maintenance of machinery and equipment.

The Reluctance of Personnel to Complete the Job: The reluctance of personnel to complete the job due to the compulsion of the underway period and duplication of duties hinders the following of the SOPs.

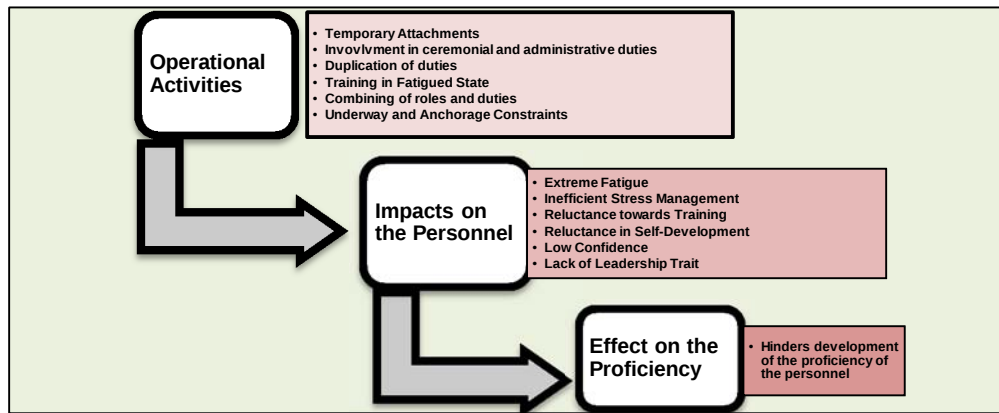
The Reluctance of Individual Self-Development: The reluctance of individual self-development due to training in a fatigued state affects overall professional skill development and general working morale.⁸

Developing of Low Confidence: Lack of confidence in professional aspects due to duplication of duties, temporary attachments, and fatigue cause reluctance in implementing theoretical knowledge in the practical field.

Lack of Leadership Trait Development: Lack of leadership trait development due to temporary attachments, duplication of duties and participation in duties other than their specialist duties hamper the working morale of the personnel.

The results of the survey authenticate and validate that the challenges analysed and discussed during various FGDs, interviews, and book analyses are real problems faced by the personnel on board BN ships. Hence, pertinent solutions can be arranged by restructuring the operational activities and mitigating the challenges and their impacts on the development of proficiency in BN personnel. A concept diagram is highlighted below to show how the challenges are affecting the development of proficiency:

Figure-4: Concept Diagram of Impacts of Challenges on the Proficiency of BN Personnel



Source: Author's self-construct

Proposed Restructured Operational Activities and the Impacts on the Development of Proficiency of the Personnel

Proposed Changes in Operational Activities: The various proposed changes in the operational activities are highlighted below:

Deployment of Ships in Mission-Oriented Roles: Ships, if deployed in mission-oriented roles, would perform better as the personnel, as well as the command, know exactly what to do, when to do, and how to accomplish the mission. Here, the personnel remain focused and perform professionally to carry out their designated missions.

Inducting Front-line Fighting Ship (FLFS) and Coastal Defence Ship (CDS) Concept: BN currently operates its fleets for all purposes for the protection of the sovereignty of Bangladesh.⁹ However, if the ships in the fleets are segregated as FLFS and CDS concepts then all ships in the fleets will know their individual purpose and perform in more mission-oriented roles. This was agreed upon by the subject matter experts during the interviews.

Segregation of Ships for Military Roles and Constabulary Roles: Presently, all the ships of the BN fleet perform both military and constabulary duties along with a versatile list of other duties. The segregation of ships as per military roles and constabulary roles may be segregated which will allow the personnel to develop their specific fields of professionalism.

Omitting Ships Employed for the Military Role from Constabulary Role: BN ships perform various roles when on patrol or a mission. Ships in constabulary duties perform military duties as well as participate in various exercises while on constabulary duty. It will allow personnel to focus on their job and grow their interest in developing their professionalism.¹⁰

Omitting Underway and Anchorage Concept: BN ships currently on patrol need to operate for a 60% underway period and a 40% anchorage period. However, it was discussed in the FGDs as well in the KIIs that omitting this concept will develop the flexibility of the command and provide a substantial amount of breathing space to the personnel on board.

Streamlining Duplication of Duties with BCG: BN performs constabulary roles along with BCG. However, in many cases, it was observed that BCG ships and BN ships are deployed in the same patrol zones. This duplication of effort can be changed by streamlining the BCG operations with BN operations and deployment according to ships available from both sides.

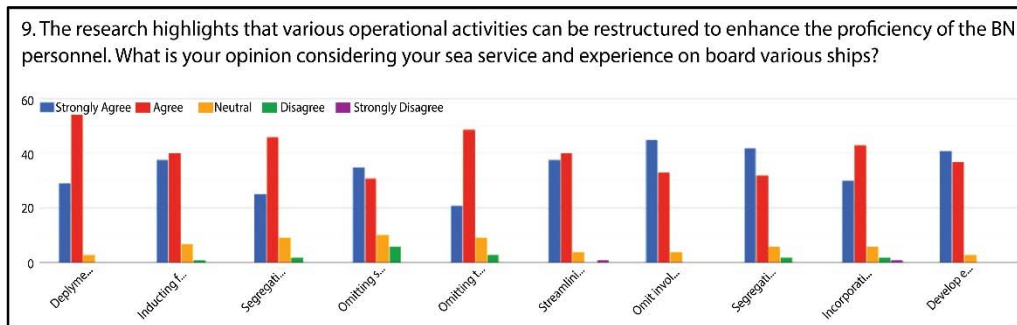
Omitting Ships' Personnel from Ceremonial and Administrative Duties: Ships' personnel are frequently sent for temporary attachment duties to perform ceremonial duties and various other administrative duties. MODCs may be utilized more to perform administrative duties to allow sailors from ships to remain on board longer and develop their professionalism.

Segregating Personnel in CIC and Watchkeeping Duties: During the FGDs, it was discussed that if personnel detailed for CIC and various other watchkeeping duties are segregated then the personnel will get more chances to develop their professionalism. The SMEs also agreed to this point.

Incorporating Equipment Maintainer and User Concept: Though this policy is already in effect, it is not fully practised onboard many ships. This practice needs to be incorporated soon as it will develop the individual professionalism of the personnel.

Utilize Equipment-Based Surveillance using Drones, Web-Based Information and Aviation Support to Monitor Designated Patrol Zones: The SMEs highlighted ships on patrol may utilize equipment-based long-range surveillance, web-based information and naval aviation support to monitor their patrol zones. The upcoming BANGABANDHU SATTELITE-2 may be utilized to perform these duties.

Figure-5: Survey Results on Various Proposed Restructured Operational Activities



Source: Google Forms Survey

Benefits of the Changes in Operational Activities: The probable impacts on the personnel after the proposed changes in operational activities are highlighted below:

Personnel will Develop Interest in Training: It is agreed by various SMEs as well as in the FGDs that personnel will develop an interest in training if ships are deployed in mission-oriented roles.

Personnel will Know Individual Jobs: Mission-oriented deployments and segregation of military and constabulary duties will help the personnel to know their jobs better.

Personnel will Develop Confidence and High Morale: Omitting the personnel from various ceremonial duties, administrative duties and temporary attachments will help them develop their confidence and reinstate their morale. Segregating the CIC personnel and watch-keeping duties will also help them learn their individual jobs and develop their confidence.

Personnel will be More Acquainted with Weapons and Sensors: Various SMEs and discussions in the FGDs derived the fact that if ships are deployed in mission-oriented roles, segregated in military and constabulary roles and the FLFS concept is inducted then the personnel will be more acquainted with weapons and sensors.

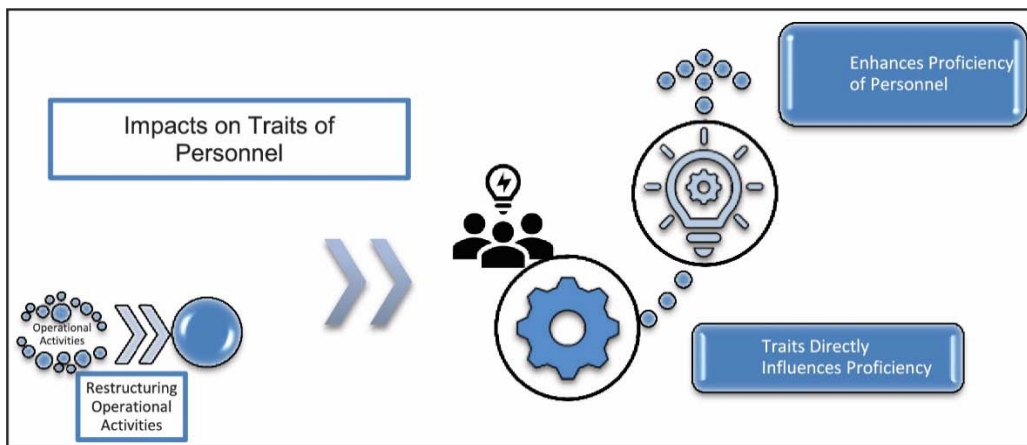
Personnel will have Good Stress Management: Many SMEs opined that the personnel will have good stress management if ships are deployed in mission-oriented roles if ships utilize technology and open-source information to carry out surveillance duties, and if ships are segregated in FLFS and CDS concepts.

Personnel will be able to Maintain Good Health: This point was agreed by various SMEs as well as in the FGDs that personnel will be able to maintain good health if various activities were restructured as proposed in the research.

Commands will be Able to Enjoy More Flexibility: Various SMEs agreed that if the underway and anchor period for ships at patrol is omitted then the commands will enjoy more freedom and flexibility.

The changes in operational activities as highlighted above are agreed upon by the majority of the respondents as well as the SMEs to develop the proficiency of the BN personnel. The survey and the interviews also confirm that these issues need to be implemented to allow the growth of professionalism in the personnel. Furthermore, the changes positively impact the development of the main traits of proficiency of the men which ultimately helps them to develop their proficiency and the proficiency of the navy as a whole. A concept diagram is proposed below which indicates that changing operational activities develops the proficiency of the men as per the research findings:

Figure-6: Proposed Construct of Restructuring Operational Activities with Enhancement of the Proficiency of BN Personnel



Source: Author's self-construct

Conclusion and Recommendations

BN is the prime organisation which protects the territorial integrity of Bangladesh in the maritime arena. With the advent of technology, hybrid threats, laws and regulations, BN needs to perform a variety of multi-dimensional tasks to safeguard national integrity at sea. To keep up with the fast-changing threat environment, BN needs to enhance the proficiency of its personnel. However, due to various challenges

and difficulties, the efficiency of the personnel on-board ships suffers adversely. Therefore, this research was undertaken to restructure the operational activities of BN to enhance the proficiency of its personnel.

Development of proficiency is hampered by various challenges like temporary attachments from ship to other billets, involvement in ceremonial and administrative duties, prolonged maritime activities in adverse weather conditions, combining military duties with constabulary duties, duplication of operations with BCG, and training under a fatigued physical and mental state. These challenges were deduced through discussions with various SMEs and validated through an online survey and statistical analysis. It was found through the interviews and surveys that these challenges directly affect the development of proficiency in BN personnel.

During the course of the study, various operational activities were observed and deduced through discussions which could help develop the growth of proficiency in BN personnel. Operational activities like the deployment of ships in mission-oriented roles, inducting FLFS and CDS concepts amongst the fleets, segregating ships for military duties and constabulary duties, omitting underway and anchorage concepts, omitting ships' personnel from performing ceremonial duties ashore, segregating CIC personnel and watchkeepers are few of the activities which may help develop condition to enhance the proficiency of the BN personnel. The changes may bring forward various benefits which directly impact the development of proficiency of the BN personnel.

It was also deduced from the study that the benefits of restructuring directly enhance the proficiency of the personnel serving onboard ships. The benefits of restructuring the operational activities directly impact the development of professional knowledge, correct implications of theoretical knowledge in professional fields, conversance with weapons and sensors, efficiency in equipment handling and maintenance, develop acquaintance with SOPs and develop a high sense of working morale. These traits are the base of proficiency as indicated previously. Hence, it can be deduced that the benefits of restructuring operational activities directly enhance the proficiency of the personnel.

Based on the above study and analysis, the following steps are recommended to restructure the operational activities to enhance the proficiency of the BN personnel:

Incorporating FLFS and CDS Concepts in BN: NHQ may form a committee comprising ACNS(O), COMBAN, COMFLOAT WEST, and DNO to formulate a Naval Instruction (NI) to segregate the fleets as per front-line fighting ships and

coastal defence ships. The segregation may be carried out in a short-term phase, intermediate phase and long-term phase keeping Vision 2041 as the basis of change.

Segregating BN Ships as Military Duty and Constabulary Duty Ships: NHQ may form a committee comprising COMBAN, COMFLOAT WEST, CSOs of both fleets and an NHQ rep to formulate a NI to segregate the present fleet as per duties. Major surface combatants may be included in military duties which will participate in military exercises and deploy far at sea. Smaller crafts like PCs and OPVs may be detailed for constabulary duties and augment BCG. This action may be carried out within a short time basis by 2023.

Omitting Underway and Anchorage Concept for BN Ships Operating at Sea: A BNTM may be formed comprising ACNS (O), COMBAN, COMFLOAT WEST, CSOs and senior COs of the BN fleet to formulate the feasibility to omit the present underway and anchorage period concept. This may be carried out in a short-time period within 2023.

Proper Employment of Personnel Performing Ceremonial and Administrative Duties: A directive from ACNS (O) under the Directorate of Naval Operations may be given to all area commanders to involve personnel serving ashore to perform ceremonial activities instead of involving personnel from ships. Additionally, MODC may be employed to perform administrative duties. This change can also be formulated on a short-term basis within 2025.

Increase Equipment-based Surveillance, Drone Monitoring and Web-based Information to Monitor EEZ: A BNTM may be formulated comprising ACNS (M), ACNS (O), DNI, DNO and area representative to check the feasibility to utilize equipment-based and drone surveillance in coordination with CNRD. Additionally, the BANGABANDHU SATELLITE-2 may be utilized to extend the surveillance and patrol reach of BN. This action can be taken on an intermediate basis within 2027 keeping the launching of BS-2 as the base date.

Notes and References

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Brief Biography



Lieutenant Commander Mohammad Pranjol Islam, (G), psc, BN, joined Bangladesh Navy on 04 July 2007 and was commissioned in the Executive branch on 01 June 2009. He is a graduate of DSCSC, Mirpur. He completed his Executive Officers Basic Course (XOBC) from BNS ISSA KHAN and attained his Watchkeeping Certificate from Ex- BNS ABU BAKR. He served in Special Security Force (SSF) from 2012 to 2016. He attended the VIPPC course in Poland, International Intelligence Analysis Course in the UK and Tactical Driving and Maneuvering Course in the USA during his

stay in SSF. He has completed the 10th Gunnery Specialization Course in Gunnery School, BNS ISSA KHAN and 52nd BN JSC from Bangladesh Naval Academy (BNA). He served Bangladesh Navy in various capacities as Gunnery Officer onboard two frigates and in BNS SHAHEED MOAZZAM. He also served as 2IC FIS in FIS DHAKA. He participated in a UN mission onboard BNS SANGRAM in Lebanon as part of UNIFIL in 2021. He served onboard BNS DURJOY as Executive Officer. Presently, he is serving in BNS HAJI MOHSIN.

Streamlining the Service Length of the Officers of Bangladesh Army: A Way Forward to Harness Professionalism for Organisational Benefit

Major Mir Morshed, SPP, psc, Infantry

Abstract

The phraseology streamlining officers' service length is nothing but a mirage for every army officer, which can only illude them but is challenging to bring into existence. The seniority-based promotion system has placed them in a specific complex situation. Moreover, the existing service length has certain discrepancies compared to modern armies and other services. Hence, it is inevitable to streamline the officers' service length to harness professionalism. This paper seeks to find ways Bangladesh Army may streamline officers' service length. Initially, the discrepancies in service length in comparison to others were identified. Thereafter, the barriers to streamlining the service length were analysed. Subsequently, this paper endeavoured to find the measures to eradicate barriers to streamlining the service length. Finally, the paper will suggest plausible options for Bangladesh Army to streamline officers' service length to harness professionalism for organisational benefits.

Introduction

Bangladesh Army (BA) is expanding its organisation on regular basis to ensure effective safeguards of the nation's sovereignty. In doing so, officers of the BA function as ways to combine other elements in bringing the best output for the organisation. However, considering the retirement age, time spent for grooming and promotion, officers have significantly less time to put their best for organisational output. Two kinds of difficulties prevail regarding the service length of officers. Firstly, a particular discrepancy is identified in varying retirement ages.¹ For instance, a Colonel of the BD Army retires at the age of 53, whereas at the identical rank, the Navy and Air Force officers go on retirement at 54 years of age. This difference in retirement age is more at the upper tier of the organisation. This problem is magnified as the service length and individual age are considered for retirement, putting a strenuous job on the Military Secretary (MS) Branch (Br).

After moving to the upper tier, officers have significantly less time to commit to organisational benefits. It is well known that young generals, commanding officers, and soldiers perform better. The renowned generals were at the peak of performance at a young age, such as Alexander at 25 years, Hannibal at 33 years, Caesar at 44 years, and Napoleon at 37 years. During the 1967 and 1973 Wars, the young Israeli generals

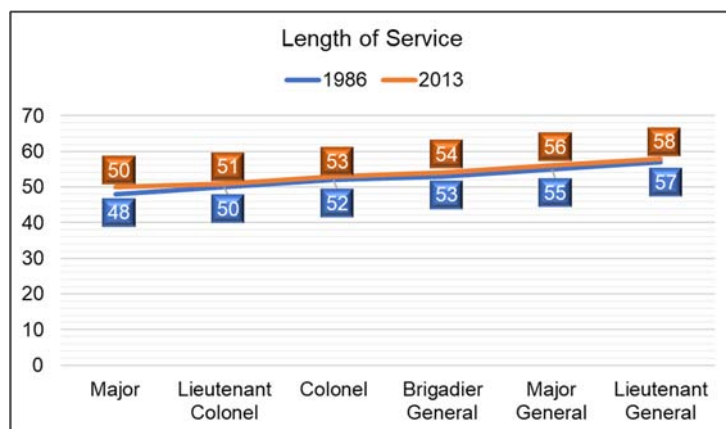
exhibited exceptional military leadership. Most generals were between thirty-five and forty. The Indian Army revisited the retirement age and increased the Colonel's age and above officers.² On the other hand, the Nepalese Army and Pakistan Army have adopted a fast-tracked promotion system.³ The Israeli Defence Force (IDF) decreased the battalion commander's age to 34-32 years to accelerate promotion.⁴

However, BA is yet to streamline the officers' service length to harness professionalism for organisational benefit. Hence, it is necessary to determine the options for streamlining officers' service length. In doing so, this paper will initially identify the discrepancies in BA officers' service length compared to others. Thereafter, the barriers to streamlining the service length will be analysed. Subsequently, this paper will endeavour to find the measures to eradicate barriers to streamlining the service length. Finally, the paper will attempt to find plausible options for Bangladesh Army to streamline officers' service length and harness professionalism for organisational benefits. This paper aims to bring out plausible options for Bangladesh Army to streamline officers' service length to harness professionalism for organisational benefits.

Present Length of Service of BA Officers

In 1986, from the 'Army Act 1952' BA officers' length of service was reformed. On 20 October 2013, the second reform was amended, 'Rule 262, Clause 1.' The rule's last edition sets today's existing length of service. In 2013, the Ministry of Defence (MoD) redefined the length of service in terms of both service limit and age limit for all corps (without the prejudice of powers for termination of service conferred upon prescribed authorities).⁵ However, the content analysis shows an insignificant rise in the length of service.

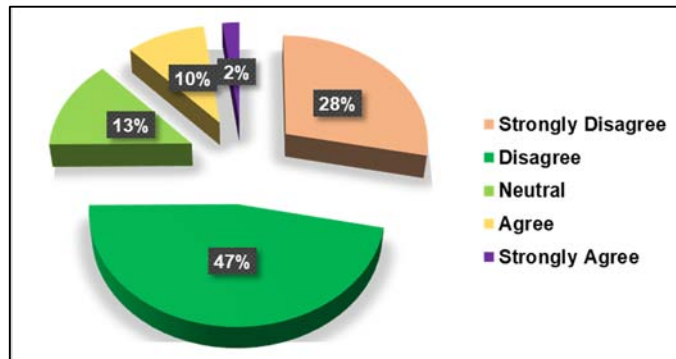
Figure-1: Length of Service of BA Officers



Source: Author's self-construct

In 2013, BA officers' service length did not increase significantly to derive maximum benefit for the organisation. Moreover, the problem is coupled with officers' promotions later in their careers. Hence, due to the existing service length and promotion prospects, officers are less capable of providing the best output to the organisation. Additionally, officers are retiring without getting the scope for moving to the elevated ranks.

Figure-2: Respondents' Opinion of Streamlined Service Length

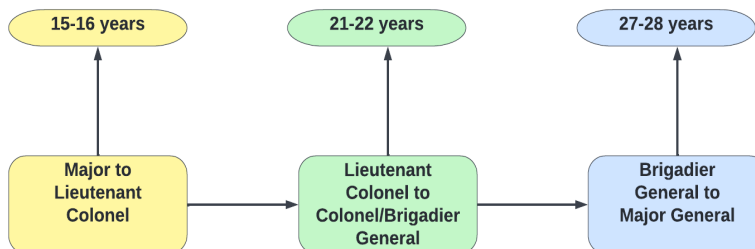


Source: Author's self-construct

Review of Length of Service of Others

Fast Tracking System of Pakistan: Pakistan Army's (PA) promotion system does not fully define the fast-track promotion system. It includes broad promotion tenure (Diagram 2) and a fast-track promotion system to streamline the officers' service length. Moreover, it comprises seniority and merit for direct promotion from Lieutenant Colonel to Brigadier for the best utilisation of Brigadiers who have attained the required standards to be promoted to this rank.⁶

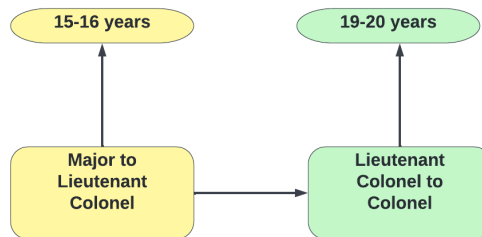
Diagram-1: Promotion Years of PA Officers



Source: Author's self-construct

Fast-Tracking System of the Nepalese Army: Nepalese Army follows 20 years of service for mature retirement (eligible for pension) and 61 years of age (age limit is different as per rank).⁷ On the other, for promotion, seniority is maintained till the rank of Major, and fast-track and merit-based promotion is followed for upper tiers.⁸ Therefore, the Nepalese Army reviewed the fast-track system to make it more scientific and need-based.

Diagram-2: Promotion Years of Nepalese Army Officers



Source: Author's self-construct

Zone-Based Promotion of the USA Army: Every promotion in the USA Army has a “below the zone (BZ),” “primary zone (PZ),” and “above the zone (AZ)” consideration.⁹ PZ is based on the standard year in service which can be considered for the next rank. BZ is one year before the PZ, and AZ is one year after an officer should usually be promoted.¹⁰ The number of BZ officers recommended for promotion cannot exceed 10% of the total number the board is permitted to pick in each competitive category; the Secretary of Defence may increase that proportion to 15%.

Figure-3: Officers’ Professional Timeline of US Officers

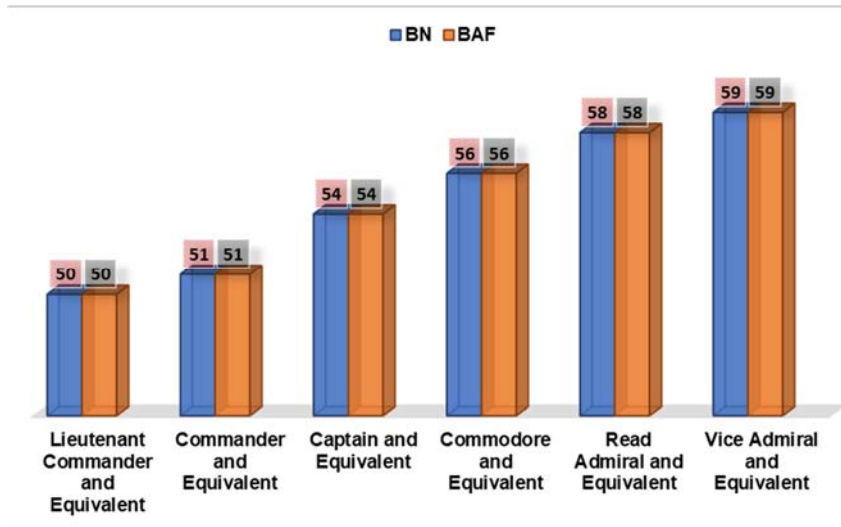
OFFICER PROFESSIONAL TIMELINE												
COHORT YG	PZ CPT	BZ MAJ	PZ MAJ	BZ LTC	PZ LTC	1ST BN CSL	1ST SSC	LAST BN CSL	BZ COL	PZ COL	1ST BDE CSL	LAST SSC
FY20 MONTH OF BOARD	APR	JUL	JUL	FEB - MAR	FEB - MAR	SEP	AUG - SEP	SEP	JAN	JAN	AUG	AUG - SEP
FY21 MONTH OF BOARD	APR	MAR - APR	MAR - APR	DEC	DEC	JUL	JUL - AUG	JUL	DEC	DEC	AUG	JUL - AUG
FY22 MONTH OF BOARD	APR - MAY	MAR - APR	MAR - APR	OCT	OCT	MAY	JUL	MAY	OCT	OCT	MAY	JUL
1996				2011	2012	2012	2014	2014	2016	2017	2017	2019
1997				2012	2013	2013	2015	2015	2017	2018	2018	2020
1998				2013	2014	2014	2016	2016	2018	2019	2019	2021
1999				2014	2015	2015	2017	2017	2019	2020	2020	2022
2000				2015	2016	2016	2018	2018	2020	2021	2020	2023
2001			2010	2016	2017	2017	2019	2019	2021	2022	2021	2024
2002		2010	2011	2017	2018	2018	2020	2020	2022	2023	2022	2025
2003		2011	2012	2018	2019	2019	2021	2021	2023	2024	2023	2026
2004		2012	2013	2019	2020	2020	2022	2022	2024	2025	2024	2027
2005		2013	2014	2020	2021	2021	2023	2023	2025	2026	2025	2028
2006		2014	2015	2021	2022	2022	2024	2024	2026	2027	2026	2029
2007	2010	2015	2016	2022	2023	2023	2025	2025	2027	2028	2027	2030
2008	2011	2016	2017	2023	2024	2024	2026	2026	2028	2029	2028	2031
2009	2012	2017	2018	2024	2025	2025	2027	2027	2029	2030	2029	2032
2010	2013	2018	2019	2025	2026	2026	2028	2028	2030	2031	2030	2033
2011	2014	2019	2020	2026	2027	2027	2029	2029	2031	2032	2031	2034
2012	2015	2020	2021	2027	2028	2028	2030	2030	2032	2033	2032	2035
2013	2016	2021	2022	2028	2029	2029	2031	2031	2033	2034	2033	2036
2014	2017	2022	2023	2029	2030	2030	2032	2032	2034	2035	2034	2037
2015	2018	2023	2024	2030	2031	2031	2033	2033	2035	2036	2035	2038
2016	2019	2024	2025	2031	2032	2032	2034	2034	2036	2037	2036	2039
2017	2020	2025	2026	2032	2033	2033	2035	2035	2037	2038	2037	2040
2018	2021	2026	2027	2033	2034	2034	2036	2036	2038	2039	2038	2041
2019	2022	2027	2028	2034	2035	2035	2037	2037	2039	2040	2039	2042
2020	2023	2028	2029	2035	2036	2036	2038	2038	2040	2041	2040	2043
2021	2024	2029	2030	2036	2037	2037	2039	2039	2041	2042	2041	2044
2022	2025	2030	2031	2037	2038	2038	2040	2040	2042	2043	2042	2045

Source: Author's self-construct

Revised Service Length Policy of Indian Army and IDF: Indian Army struggled with the different lengths of service of tri-services. However, the Indian Army revisited the retirement age and streamlined tri-services in 2021.¹¹ In addition, the Indian Army has reconsidered the promotion timeframe of Colonel to the service length of 16 years. Hence, the upper tiers will have younger commanders on the ground.¹² Similarly, in 2014, IDF re-evaluated battalion commanders' ages to 32-34 years to have younger commanders in the future.¹³

Length of Services of Sister Services: Bangladesh Navy (BN) and Bangladesh Air Force (BAF) streamlined their officers' service length in 2013.¹⁴ As a result, both services increased the officers' service length as shown in Figure-4. Moreover, BAF streamlined officers' service length by implementing a set policy.¹⁵ However, promotion is often delayed due to the lack of vacancies.

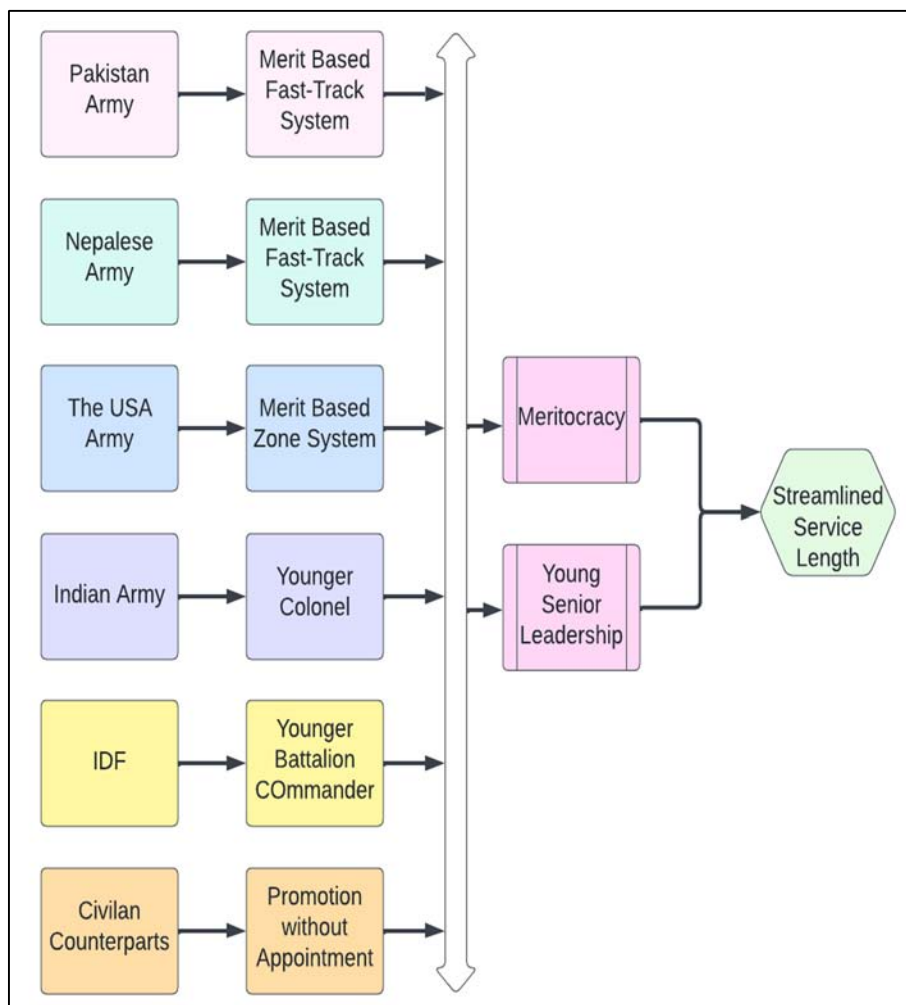
Figure-4: Length of Service of BN and BAF Officers



Source: Author's self-construct

Sister services, civilian counterparts, and modern armies have streamlined officers' service length to harness professionalism and maximise organisational benefits.¹⁶ On the other hand, BA is yet to streamline the service length of officers. Henceforth, BA is now lacking the maximum output of the officers. A cumulative analysis of the modern armies in Diagram 3 shows that every Army has addressed having younger senior leadership to serve longer to provide better output.

Diagram-3: Analysis of Service Length

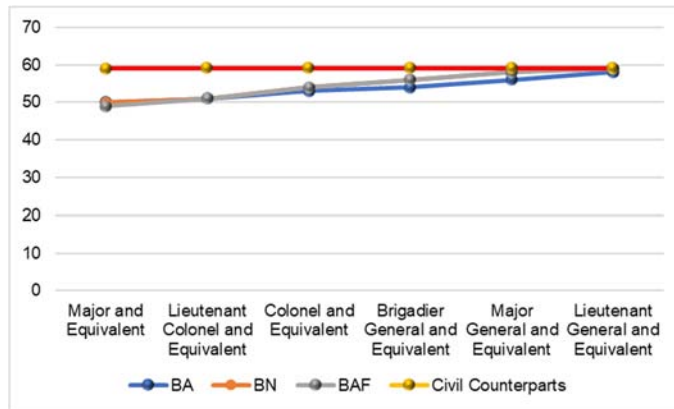


Source: Author's self-construct

Discrepancies of BA Officers' Service Length

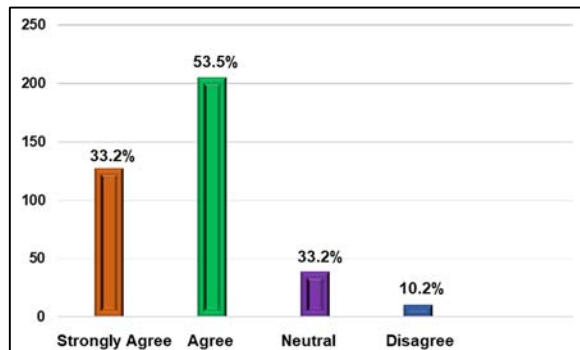
The following are the salient points in this aspect:

Varying Retirement Age in Bangladesh: Government employees of the Bangladesh Armed Forces and civilian counterparts have varying retirement ages as shown in Figure 5. The discrepancy between Armed Forces and civilian counterparts occurred due to the pyramid structure promotion system of the Armed Forces.¹⁷ Nevertheless, within the armed forces varying retirement age affects the morale of the officers.¹⁸

Figure-5: Varying Retirement Age

Source: Author's self-construct

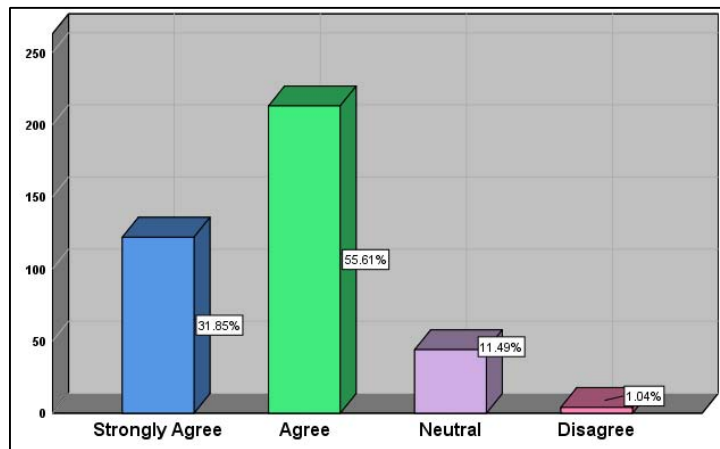
Greying Age of Senior Leadership: BA officers move to senior leadership and authoritative positions later in their careers and put stress on mental and physical health. Hence, the Army is deprived of the service of officers for early retirement.¹⁹ Consequently, senior leadership faces difficulty in providing the best output for the organisation. Figure 6 shows that 53.5% of officers agreed that the greying age of senior leadership affects the organisation, whereas 33.2% strongly agreed.

Figure-6: Greying Age of Senior Leadership

Source: Author's self-construct

Seniority Supersedes Merit: Officers' length of service is affected due to the seniority-based promotion system. Many meritorious officers are retiring without sufficient chances to move to the upper tier (Case Study). Consequently, it affects BA's hardworking officers morale and results in less productivity. 55.61% of officers agree that in BA, seniority supersedes merit. However, only 1.04% of officers negligibly disagree with the statement as shown in Figure 7.

Figure-7: Respondents' Opinion of Seniority Supersedes Merit

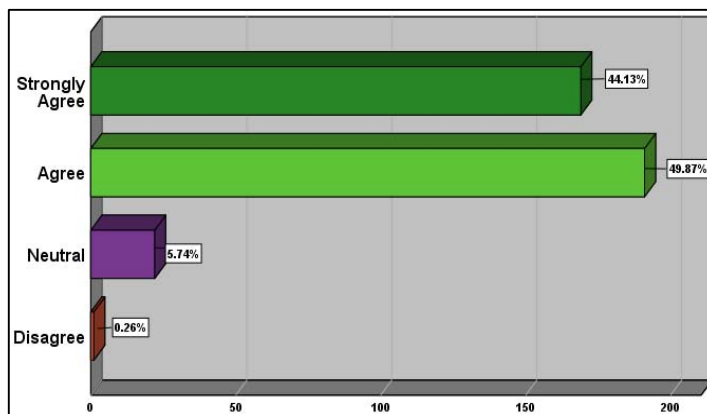


Source: Author's self-construct

Less Time to Provide Maximum Output: BA officers' promotion is often delayed due to a lack of vacancies.²⁰ Now and then, officers are promoted to senior leadership positions on the verge of retirement. Consequently, senior leadership retires before fulfilling the command philosophy.²¹ Hence, the organisation suffers from monetary losses.

Affecting Professionalism of Officers of BA: BA officers' professionalism is affected due to all factors of the above discrepancies. Hardly working officer diminishes hardworking officers' productivity. Resultantly, it affects the professionalism of the officers of BA. 44.13% of officers strongly agree that the existing service length affects promotion, whereas 0.26% disagree.

Figure-8: Respondents' Opinion of Service Length Affecting Professionalism



Source: Author's self-construct

Barriers to Streamlining the Service Length

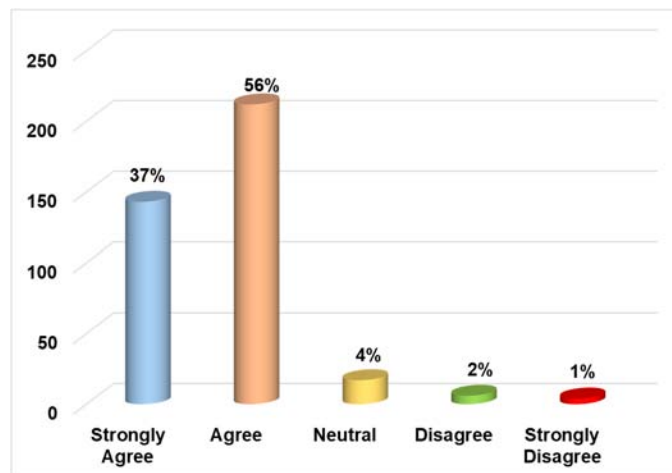
These are briefly discussed below:

Social Barriers

Bangladesh Army, being a small organisation, a meritocracy-based promotion system may raise despondency and self-blame among a few BA officers. Besides, social comparison may also contribute to others' feelings of being an outsider. On the contrary, the seniority-based system leaves behind meritorious officers. Hence, stagnation affects the organisation's overall performance. The duel between seniority and meritocracy will create social defiance.

The human brain and body are designed to resist changes; BA officers are no exception. Additionally, family is also included in the transformation of service length. Therefore, officers who will be promoted based on merit will be able to adapt quickly. On the contrary, officers who may be left behind based on merit will resist the reform.²² Hence, leadership should have the willpower to make it happen to materialise the unpopular decision. 56% of officers agreed that psychological adaptability to reform would pose a barrier to streamlining the officers' service length; on the contrary, 2% disagreed.

Figure-9: Respondents' Opinion on Psychological Adaptability to Reform

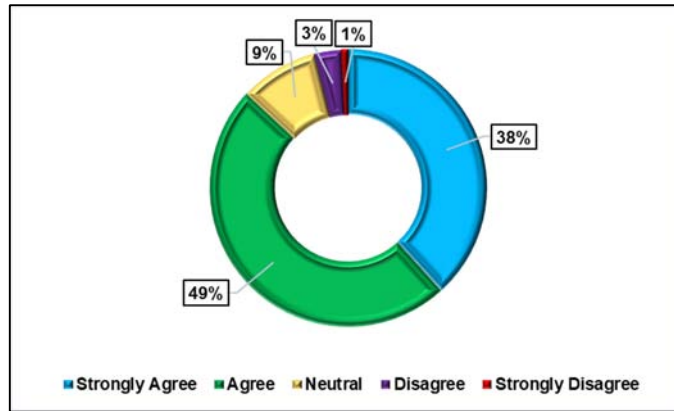


Source: Author's self-construct

Civilian counterparts and BP reach the authoritative position before the BA officers.²³ On the contrary, BA officers get the authoritative position after becoming Brigadier General at 21 years of service (practically at 26-27 years of service age).²⁴ Yet, the civilian counterparts consider BA officers as a privileged group. Therefore, a negative perception prevails among the counterpart. Further reform to streamline the BA

officers' service length will have a more negative perception of the civilian employees. 49% of the respondent also agreed with the statement.

Figure-10: Respondents' Opinion on Counterpart's Perception

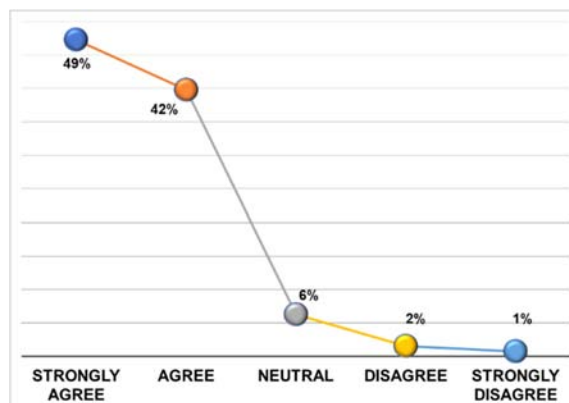


Source: Author's self-construct

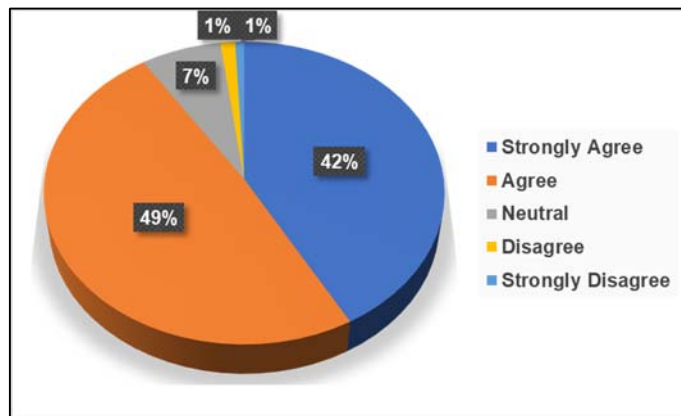
Organisational Barriers

There may be a conflict between meritocracy and seniority of leadership. Army as a profession involves productivity from the younger leadership. For example, in the Arab-Israel War in 1973, IDF studied that younger commanders were the key to launching a counter-offensive without delay.²⁵ However, the seniority-based promotion system in Bangladesh provides a mature commander, and the productivity period is often overlooked. Consequently, streamlining the service length will have a dual meritocracy and leadership seniority. Figure 11 shows that 49% of officers strongly agreed that a duel between meritocracy and seniority would prevail if service length were streamlined.²⁶

Figure-11: Respondents' Opinion of Meritocracy and Seniority

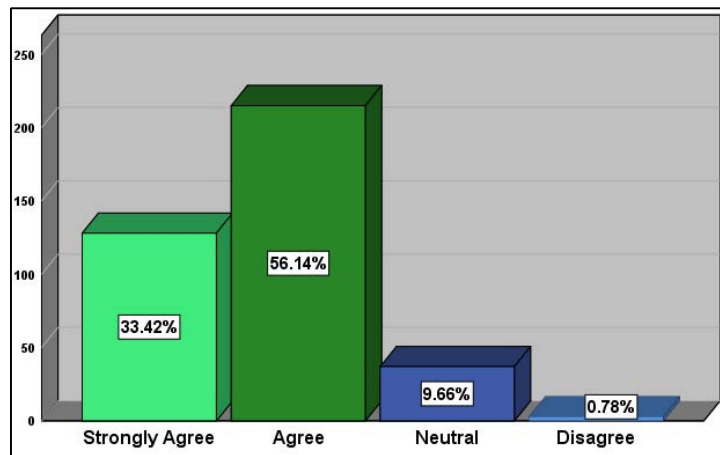


Source: Author's self-construct

Figure-12: Respondents' Opinion on Limited Promotion Prospect

Source: Author's self-construct

Second, defence reforms and streamlining officers' service length impact the national defence environment. Besides, BA's promotion policy depends on government economic policies and financial constraints, which require political decisions. Therefore, though streamlining service length within the existing framework will have an insignificant impact on government policies, it requires a drive to address the issue.

Figure-13: Respondents' Opinion on Government's Constraints

Source: Author's self-construct

If the service length of BA officers is streamlined, there will be a crisis in the transition period. For instance, if the service length of a Colonel is increased from 53 years to 54 years, there will be limited promotion prospect for the present Lieutenant Colonels.²⁷ Besides, if BA promotes 10% of BZ Colonel to Brigadier General, PZ

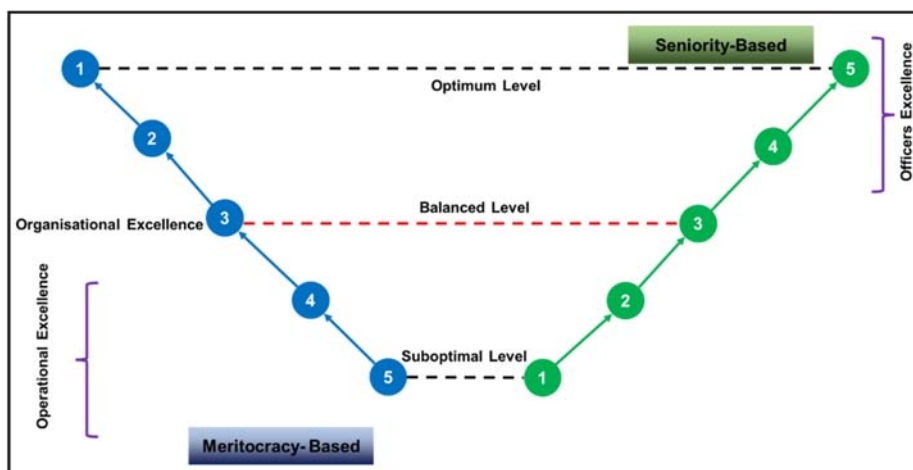
officers will have fewer vacancies. Nevertheless, the crisis period is temporary and can be mitigated by the prudent decisions of the leadership.

Plausible Options for Eradicating the Existing Barriers

This is briefly described as follows:

Balancing Between Meritocracy and Seniority: The first and foremost barrier for a leader is to manage the duel between meritocracy and seniority. For instance, a Brigadier General promoted at the age of 50 will have more experience; however, he will have a reduced amount of time to provide optimal output to the organisation. On the contrary, a Brigadier General at 44 years of age will have less experience than earlier; nevertheless, they will have a longer time to serve the organisation. Senior leadership may make the balance by selecting the right person through the well-set meritocracy-based promotion system to plug in the gap in experience (Diagram-4).

Diagram-4: Balance Between Meritocracy and Seniority

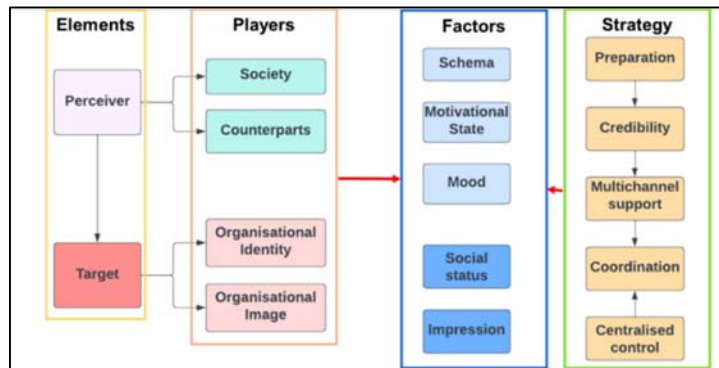


Source: <https://www.linkedin.com/pulse/demystifying-term-maturity-balance-between-customer-provider-van-bon/>

Transition Period Management: Streamlining the officers' service length includes policies of the government, policies of the organisation, and input of individual officers. Firstly, all the elements are interred dependable; secondly, none of the features can be achieved in a short duration for better endurance. Hence, the transition period must be extended to balance accelerated promotion and extended service. Additionally, more United Nations missions and deputations in various nation-building projects from all arms can increase vacancies for promotion to meet the transition period crisis.

Perception Management: In today's world, perception is more important than reality. As a result, civilian counterparts negatively perceive BA officers as the privileged group in society. Besides, societal perception of meritocracy-based promotion is also required within the Army. Moreover, perception management may help streamline officers' service length within government constraints. Diagram-5 portrays a strategy of perception management.

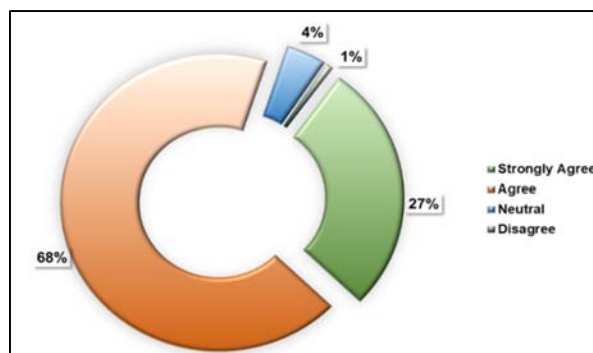
Diagram-5: Perception Management Strategy



Source: https://psychology.fandom.com/wiki/Perception_management

Set Policy for Streamlining Service Length: BA has two policies for streamlining officers' service length: a gazette on retirement age and Army Regulations (Rules) for defining service limits for temporary/substantive rank. Besides these two, the Armed Forces officer's promotion policy is circulated to selection board members. Therefore, to simplify the service length, a cumulative new policy must be formulated to define each parameter subjectively. Among the respondents, 68% agreed that a set policy is required before streamlining the service length. However, 1% of officers disagreed with the statement.²⁸

Figure-14: Respondents' Opinion on Setting Policy



Source: Author's self-construct

Options of Bangladesh Army for Streamlining Service Length

BA officers' service length is determined by the age and service length limits which poses difficulty in management. Besides, Bangladesh's perspective often endorses the Army by manipulating the date of birth. Therefore, BA may follow fixing the service length for retirement and promotion. A suggested model for long-course officers is shown in Table-1.

Table-1: Proposed Service Length

Ser (a)	Rank (b)	Existing System					Proposed System			
		Service length of Retirement (c)	Retirement as per Age Limit (d)	Service length of Retirement Age (e) = (d-22)	Service Retirement for Temporary Rank (f)	Service Age Left before Retirement (g) = (e-f)	Service length of Retirement ** (h)	Service Retirement for Temporary Rank (j)	Age on Promotion to the particular Rank* (k) = (h+22)	Service Age Left before Retirement (l) = (d-22)
1	Lieutenant General	33 years	58 years	36 years	34 years	2 years	37 years	33 years	55 years	4 years
2	Major General	31 years	56 years	34 years	31 years	3 years	35 years	29 years	50 years	6 years
3	Brigadier General	29 years	54 years	32 years	21 years	11 years	33 years	21 years	43 years	12 years***
4	Colonel	28 years	53 years	31 years	20 years	11 years	32 years	20 years	42 years	12 years
5	Lieutenant Colonel	26 years	51 years	29 years	15 years	14 years	30 years	15 years	37 years**	15 years
6	Major	25 years	50 years	28 years	-	-	29 years	-	-	-

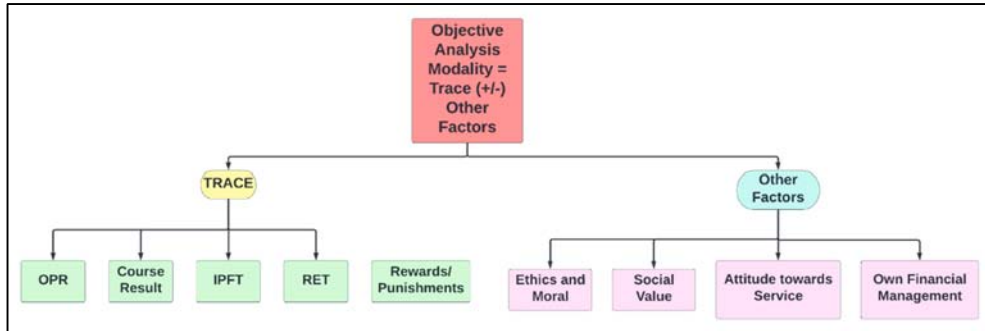
* The age of joining Bangladesh Military Academy is 18-21 years of age
 * Average commissioned age is $(21+24)/2=22.5$ (considered 22)
 ** Only service length will be considered for retirement. The maximum age during retirement for Lieutenant General will be 37 years +22 years ago= 59 years
 *** An individual can serve longer after reaching to authoritative position, and commanding officers will be at the young age

Source: Author's self-construct

Most organisations of the present-day world refer to merit-based promotion system. So, the merit-based promotion has become culturally accepted in the private sector and modern armies. Proper merit assessment procedures should be used to evaluate officers' performance so that no one gets favour from the meritocracy-based system. At present, the selection board is based on subjective and objective analysis. The primary tool for accurate analysis is Tabulated Record and Comparative Evaluation (TRACE) which is a cumulative record of Officers' Performance Report (OPR), courses result, Individual Physical Fitness Test (IPFT) result, and rewards or punishment. A significant share (60%) is from OPR. However, the OPR grading system is also a subjective analysis likely to differ from person to person. Therefore, the merit-based promotion system needs a better objective analysis tool.

Furthermore, an objective analysis modality which will include the subjective part is required to have a reliable analysis modality as shown in Diagram-6.

Diagram-6: Objective Analysis Modalities



Source: Author's self-construct

Moreover, fixing the timeframe is crucial to managing the transition period crisis. Based on the analysis, 5-10 years will be a too broad timeline; on the contrary, 1-2 years will be too little to implement. On the other hand, 3-5 years provide a leveraged time to restructure the portion system and evaluate after implementation. Therefore, the total procedure may finish within 3-5 years, as shown in Diagram-7.

Diagram-7: Proposed Option

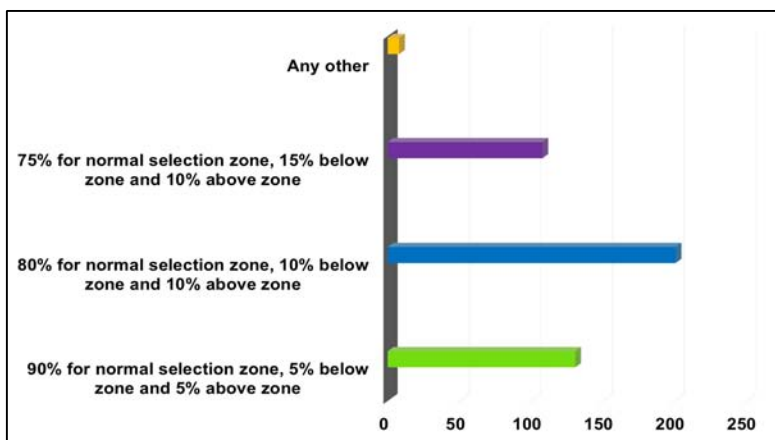
-Formulating Policy	-AZ and BZ promotion based on merit (percentage to be set by board)		
-Articulating the time frame	- PZ promotion based on seniority		
-Framing the subjective analysis	-Application of subjective analysis model	-Merit-based promotion -Take approval on maximum service limit -Application of maximum service limit	-Evaluation of the new system -Mitigate the challenges (If arise)
-Circulating the Policy	-Correspondence related to the service limit		
-Fixing the maximum service limit	-Create vacancies to check the application of maximum service limit		
6 Months	1 Year	1 Year	6 Months
Total Duration: 3 years			

Source: Author's self-construct

The role of the MS Branch is significant. MS Branch primarily handles officers' career profiles. Besides, MS Branch also determines promotion vacancies and portrays courses to be discussed, in short, who will be considered in the selection board. Therefore, MS Branch can be pivotal in determining the percentage of AZ and

BZ promotion in the first year. Furthermore, the objective analysis modalities may be fixed after a study by the MS branch. A survey was conducted to determine the AZ and BZ promotion percentages in the first year. As a result, 201 respondents out of 383 opined to have 10% each for the AZ and BZ promotion. In contrast, 131 officers agreed to have 5% each for the AZ and BZ promotions.

Figure-15: Respondents' Opinion on Zone-Based Promotion



Source: Author's self-construct

Conclusion and Recommendations

BA is expanding to protect national sovereignty, where officers act as glue to combine other components for the optimum organisational output. However, considering retirement age, grooming time, and promotion prospects, officers have less time to put in their best effort. As a result, BA officers' service length is not streamlined compared to others, with certain discrepancies. Hence, BA, as an esteemed organisation, is deprived of the better service of its officers. Modern armies like India, Pakistan, the USA, and Israel have reviewed their officers' service length to harness professionalism. However, BA is yet to revisit the service length of its officers. The existing literature provides guidelines for streamlining the service length of different organisations. However, streamlining BA officers' service length has not been addressed in any of the literature. Nevertheless, streamlining officers' service length is a requirement to harness professionalism for organisational benefit.

The paper was initiated by reviewing BA officers' present length of service to ascertain the discrepancies compared to others. According to surveys and interviews, modern armies streamlined officers' service length as per requirement. However, BA did not streamline officers' service length after 2013; resultantly, certain discrepancies prevail between the BA officers' service length and modern armies. Additionally,

modern militaries have accelerated officers' promotion systems by implementing fast-track promotion, zone-based promotion systems, etc. Hence, it is evident to streamline BA officers' service length.

The barriers are two-folded, naming social and organisational. BA needs to manage the perception of its counterparts before streamlining the service length. Additionally, administrative barriers are stretched from a transition crisis to a period of maturity and productivity. In addition, limited promotion opportunities and institutional constraints provide a considerable barrier to streamlining the length of service. Despite barriers, there is substantial significance in streamlining officers' service length. By streamlining the service length, BA can capitalise on its professionalism to achieve maximum performance. Therefore, eradicating the discrepancy will undoubtedly result in a significant increase in output.

The paper conducted a thorough analysis to identify feasible remedies to eradicate barriers to streamlining BA officers' service length. For example, BA may choose a viable option to balance meritocracy and a seniority-based promotion system. The balance would facilitate managing the perception of counterparts and mitigate social defiance. Additionally, a set policy to streamline the service length will ensure transparency in the promotion system, giving a guideline to the senior leadership. Hence, it is necessary to eradicate the barriers to streamline the officers' service length.

The comprehensive modalities propose two ways to streamline the service length. Firstly, simplifying the retirement age of the BA officers and, secondly, restructuring the promotion system. As a result, BA officers' service length can be simplified based on service length. On the other hand, restructuring the promotion system requires a thoughtful process of fixing a timeline to materialise the service length, a promotion system based on merit, and delineating responsibilities on the MS Branch. Therefore, BA may adopt the proposed modalities to streamline the service length of the officers.

The performance of the BA largely depends on the performance of the officers. Similarly, the performance of the officers depends on harnessing professionalism by the officers. Therefore, this paper recommends streamlining BA officers' service length to harness the officers' professionalism. To do so, BA may adopt the broad modality as proposed in Diagram-7. Accordingly, the following recommendations can streamline the service length of BA officers to materialise the proposed comprehensive modality:

First, Adjutant General's Branch may form a board of officers to simplify the retirement age. Second, MS Branch may restructure the officers' promotion system

based on meritocracy with a new policy and maintain the proposed timeline. Third, MS Branch may plan to promote the officers from AZ and BZ during the first year of adopting the broad modality by fixing the percentage and maintaining the proposed objective parameters, which will be evaluated in the third year of implementation. Fourth, the senior leadership may lead in managing the perception vis-a-vis government constraints to streamline officers' service length.

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Brief Biography



Major Mir Morshed, SPP, psc, Infantry was commissioned from Bangladesh Military Academy (BMA) with 59 BMA Long Course in the Bangladesh Infantry Regiment on 24 December 2008. He is a graduate of DSCSC, Mirpur. He served in various capacities in the 4th Battalion of the Bangladesh Infantry Regiment. He held all the regimental appointments in different operational and administrative scenarios. He also served as an Instructor Class 'B' in Non-Commissioned Officers' Academy and Bangladesh Infantry Regimental Centre. Moreover, he served as a Staff Officer in Grade-2

in the Directorate General of Forces Intelligence. Apart from the mandatory courses for his professional career, he attended the Military Observer Course and Pre-Deployment Training at the Bangladesh Institute of Peace Support Operation Training. He also participated in Factory Level Repair and Maintenance Training of Barrett Communication in Australia and the Company Commander Course at the Army Combat School, Pulada, Malaysia. He served under the blue helmet in the Democratic Republic of Congo as Military Information Officer in a Bangladesh Battalion. Presently, he is serving as the Brigade Major of 101 Infantry Brigade.

Employment of Para Commando as Part of Asymmetric Warfare (AW): Bangladesh (BD) Army Perspective

Major S M Yasin Nur Siddiqui, BSP, psc, Infantry

Abstract

When belligerents differ significantly in the war effort, it is nonchalantly termed Asymmetric Warfare (AW). It is evident from the combat environment of Bangladesh that her potential adversary will outnumber her forces in size, technology, capability, relative power, equipment, organisation, and so on. Assumingly, an asymmetric approach can turn the table in her favour. A cardinal strategy in AW is to combat the enemy by following an indirect approach. Para Commando is a force that inherently functions following an indirect approach. The 1st Para Commando Battalion was formed in 1992. In 2016, it was expanded to a Brigade widening the scope of employment. The potential of Para Commando in AW is still unexplored. It can form a separate line of operation for decision-makers. Therefore, it is relevant to study the employment prospect of Para Commando in the AW scenario of the BD Army. Through the study, the intended roles of Para Commando in AW with the desired effect have been identified. In addition, opportunities presented by Para Commando in AW for the BD Army have been discussed. Then, challenges in employing Para Commando effectively have been highlighted. After that, this research proposes what measures will ensure the effective employment of Para Commando in AW. Finally, through an analytical process, the researcher has proved the hypothesis: “Effective employment of Para Commando will enhance the overall Asymmetric Warfare effort of the Bangladesh Army.”

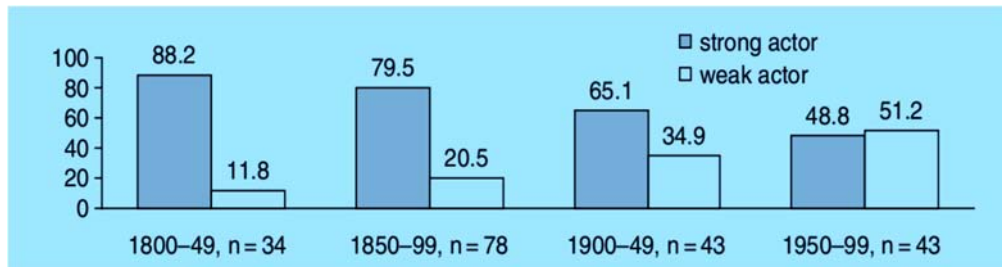
Introduction

Steven Metz and Douglas Johnson of the US Army War College define asymmetry as “acting, organising, and thinking differently than opponents to maximise one’s advantages, exploit an opponent’s weaknesses, attain the initiative or gain greater freedom of action.”¹ It is evident from the combat environment that our possible adversary will outnumber BD in almost all aspects. BD ranks substantially lower than its potential rivals in the Global Firepower Index. Consequently, issues like a lack of geographic depth must be addressed. The BD Army needs a versatile strategy to fight in the new environment. The application of AW may allow BD to beat back any superior adversary. Para Commando is an offensive force designed to achieve strategic effects in this connection. Expansion from a battalion to a brigade-size force

has added more promise for the BD Army. Therefore, the employment prospect of this force in AW needs to be addressed.

The 21st century has observed a lot of weaker nations winning against stronger ones, as opposed to Thucydides' belief that- 'the strong do what they can, the weak suffer what they must.'

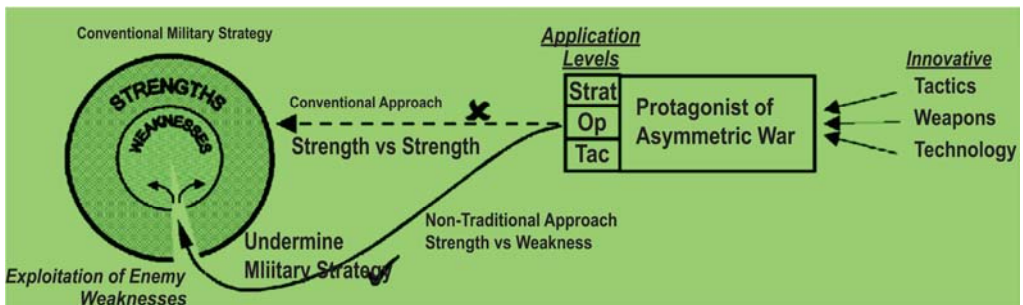
Figure-1: Winning Trend of Weaker Forces in AW



Source: Toft, 2005

The BD Army has adopted non-linear engagement, indirect approach, unconventional warfare, deception, etcetera strategies to offset the adversary's numerical, technological, and geographical ascendancy. Thus, the BD Army must devise an appropriate strategy for an asymmetric approach. Indirect approaches are asymmetric.² To adopt an indirect approach, Para Commando Brigade can be a very suitable and effective tool.

Figure-2: Asymmetric Approach at All Levels of War



Source: M R Sudhir, *AW: A Conceptual Understanding*

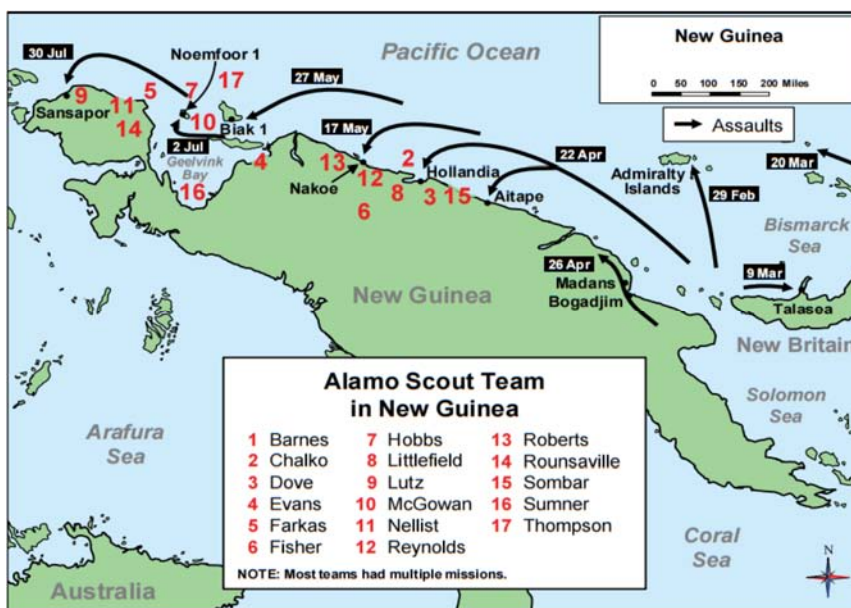
The formation of the Para Commando Brigade has strengthened the punch of the Army. Though Para Commando has tremendous potential to augment the overall asymmetric warfare effort of the BD Army, the capacity-building roadmap of the force is still unexplored. As the force is still in its adolescence, many steps can be taken to reap maximum output from the force.

Against this backdrop, the potential roles of Para Commando in the AW scenario of the BD Army have been highlighted in this writing. After that, opportunities and challenges for employing Para Commando have been discussed. Finally, a few plausible measures to employ Para Commando have been suggested, followed by a few recommendations to gain the maximum benefit from Para Commando force.

Potential Roles of Para Commando in AW

Direct Action Operations are typical commando missions, short-duration strikes, and other small-scale offensive actions. Para Commando may use raid, ambush, or direct assault tactics; emplace mines and munitions; carry out standoff attacks by fire from the air, ground, or maritime platforms; provide terminal guidance for precision-guided munitions and carry out sabotage in a direct-action role. Further, some information can be acquired by only human intelligence resources in the target region, even with today's advanced technologies. Special reconnaissance against operational and strategic targets beyond the reach of traditional reconnaissance units is possible by Para Commando as they will operate behind the enemy lines.

Figure-3: Alamo Scout Team in New Guinea WW2



Source: <https://www.google.com/search?client=firefox-b-d&q=Alamo+Scout+Team+in+New+Guinea>

Para Commandos can augment the overall national effort in AW by conducting coordinated operations with Unconventional Warfare Forces (UWF). Para Commando can coordinate with UWF in infiltration operations, impart training, exchange

real-time information, provide specialists, and aid in sabotage and subversive activities. Finally, Para Commandos can project power in the battlefield framework. They can achieve this by surgical precision, clandestine operation, etcetera. When fighting is most intense, Para Commando can reinforce forces in peril. Para Commando may seize and hold operational entry points until ground forces can link up.³

Miscellaneous Potential Roles of Para Commando: Long-Term Perspective

- Para Commando may create a picture of the Operational Environment beyond conventional resources and capabilities.
- Para Commando may be integrated into psychological and information warfare.
- Para Commando may be employed in the target acquisition role and to assess the post-attack scenario.
- Para Commando can leverage drone technology advancements to support deep fires with future capabilities such as “drone swarming.” Para Commando can conduct drone ambushes and raids. Para Commando will conduct mostly effect-based operations.
- Para Commando may be employed in the combat recovery mission. They can recover lost personnel, prisoners of War (POWs), dug-in caches, etc. Para Commando can organise and conduct clandestine and covert operations.

Employing Para Commando in AW: Opportunities

In 2016, an Adhoc Para Commando Brigade was raised with two battalions in BD. Very soon, a third battalion will be raised. This force will increase the opportunities for the BD Army in the overall warfare effort. The potential of this force is immense. However, with the expansion of the force, the capacity of the force needs to be increased.

Only psychologically and physically fit soldiers are selected for the commando course following the motto- survival of the fittest. The trainees are imbued with the teaching, “When going gets tough, tough gets going.” After the course, Commandos are posted to the Para Commando Brigade and training continues. Commandos are exposed to joint training with the Special Forces (SFs) of various friendly countries like the United States of America, the United Kingdom, etcetera. In addition, once the Commandos reach a certain age, they are returned to Infantry units to maintain the overall fitness of the Brigade.

The Para Commando performs tasks beyond conventional forces’ scope. The targets for special reconnaissance may be enemy Command and Control (C2) systems, troop concentration, long-range weapons, identification of the location of POWs,

information on critical infrastructures, ammunition dumps, bridging assets, etcetera.⁵ Finally, the first four capabilities of the Para Commando Brigade is related to operations behind the enemy lines. Para Commando may infiltrate behind the enemy lines by any means: land, water, or air. Para Commando can establish hideouts in enemy territory and conduct operations from there. Para Commando can be inserted by helicopter when the helicopters fly following the ‘nap of the earth’ technique. Para Commando can operate behind enemy lines for seven days without a food supply.

Challenges in Employing Para Commando: BD Context

Defensive Doctrine of BD - A Paradox: Since independence, BD has followed a ‘Defensive Posture’ as the cornerstone of her defence policy to protect her sovereignty and territorial integrity.⁶ The paradox is that SFs are offensive by their very nature. They need offensive spirit and training because they undertake complex and specific operations. SFs would be constantly challenged without a doctrine that calls for offensive activities.

Budgetary Constraints and Bureaucratic Complexities: The defence budget of BD is a concern for the advancement of the SFs. Moreover, Para Commando does not receive priority in security issues. In addition, though it has been planned to raise a division size force of SFs as per “Forces Goal-2030”, the progress has been stalled due to the government’s bar on increasing total strength. This may put the Para Commando’s progress in the back seat for a while.

Need for Modernization and Skill-Based Training: The newly formed Para Commando Brigade needs improvement in training, communication, equipment, and other areas. Regularity in training should always be emphasized.⁷ SFs lag in training facilities for combat tracking, mountain warfare, jungle warfare, airborne speciality, counter surveillance, special reconnaissance, communication, surveillance, target detection, data processing, information exchange, and combat medication.

Unstructured Doctrines and Perspective Plan: The BD Army is yet to finalise a doctrine for Para Commando. In addition, there is, so far, no plan for integrating all services SFs in the country. Without doctrine, Para Commando cannot make any progress in its operational module. The doctrine will dictate the organisation, training, weapon and equipment procurement, operation procedures, etcetera.⁸ In addition, there is no perspective plan for the Para Commando to bridge the skill gaps through training.

Barriers to Effective Interoperability: Joint planning and execution are imperative for the employment of SFs. A very limited number of Joint training or exercises are being conducted between the Para Commando and the sister services. Introducing similar small arms, the same type of communication system, parachute and related gears, and similar diving apparatus can facilitate joint operations. In addition, there are no dedicated air assets for the Para Commando Brigade.

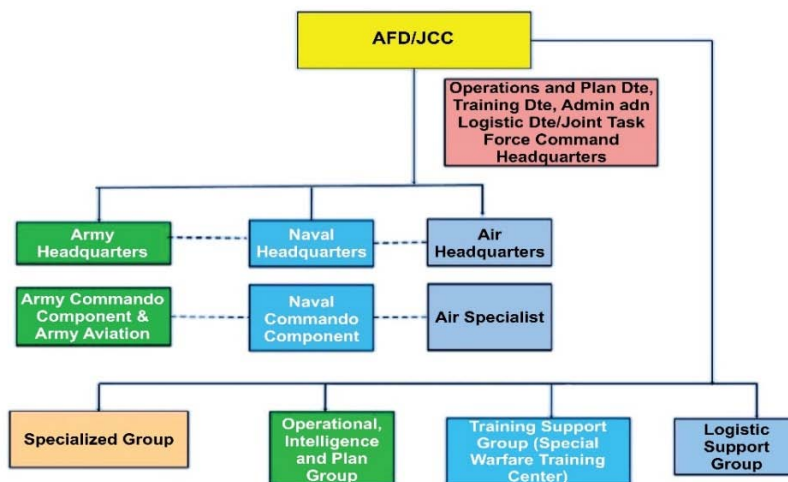
Logistic- A Puzzle for the Army: The major drawback of the conventional logistic support system is its inflexible nature and reliance on the central and forward bases for replenishment. Such set-pattern logistics support systems often will not support many of the SF's operations behind the enemy lines. Conventional logistic support systems cannot wholly support such activities. Therefore, the logistic support system of Para Commando must be adaptable to the changing mission perspective.⁹

SF Management and Coordination: A Hoax: Special Warfare (SW) Wing is the trainer organization of the Para Commando force, which functions under a separate command channel. In addition, at present, Military Operation Directorate (MO Dte) is responsible for any operational employment of the SF Brigade. Moreover, there are no dedicated or posted SF Officers in Joint Operation Section. On the other hand, Military Training Directorate (MT Dte), Army Headquarters looks after the overall training module of Para Commando. The SF has no separate records.

Mitigating the Challenges: Proposals for Ways Forward

A Viable Command Structure for Interoperability: The tri-service of BD and Armed Forces have three separate SFs. Among them, the SF of the BD Army has got 1500 members (Para Commando Brigade), Bangladesh Navy (BN) has 500 members Special Warfare Diving and Salvage (SWADS), and BD Air Force (BAF) has 42 members.¹⁰ Para Commando will need the assistance of the BD Navy and the BD Airforce based on mission, terrain, and threat. Therefore, Para Commando needs to be flexible in operability. Thus, an effective command chain will have to be established. Changing the mindset to a common state will be a continuous process. Following is a proposed organogram for the joint special operation force for BD Armed Forces.

Figure-4: A Organogram for the Joint Special Force for BD Armed Forces



Source: Author's self-construct

Impart Skill-Based Training: SF skills are critical in times of need, and there should be a software-supported network-centric database with access control of every specialised trained individual (officers and men). This should be maintained and updated by Para Commando Brigade and Special Warfare Wing. All the officers and members of Para Commando will be highly trained and pursue their core activities only.

Figure-5: Breakdown of the Para Cdo's Strength

Sub-Unit	Rigger	JM	FF	PF	Mtn climbing	CIED	JW	Cbt Tr	Cbt Survival	Language	Cbt Medic
3 X Platoon Per Cdo Company (A, B & C Company)											
3 X Platoon-1 (3 X Section)	09	09	09	06	09	18	09	09	09	09	09
3 X Platoon-2 (3 X Section)	09	09	09	06	09	18	09	09	09	09	09
3 X Platoon-3 (3 X Section)	09	09	09	06	09	18	09	09	09	09	09
3 X Sp Platoon + Company HQ (3 X Section)	06	06	03	-	-	-	-	-	-	-	-
Support Company											
Mortar Platoon (3X Section)	03	03	-	-	-	-	-	-	-	-	-
Missile Platoon (3X Section)	03	03	-	-	-	-	-	-	-	-	-
Anti-Terrorist Platoon (3X Section)	03	03	03	-	-	-	-	-	-	-	-
HQ Company											
Battalion HQ (4 X Section)	-	-	-	-	-	-	-	-	-	-	-
Admin Platoon (3 X Section)	03	03	03	-	-	-	-	-	-	-	-
Company HQ & Signal Platoon (3 X Section)	03	03		-	-	-	-	-	-	-	-
MT Platoon (5 X Section)	03	03		-	-	-	-	-	-	-	-
Total	54	51	36	18	27	54	27	27	27	33	33
Reserve (50%)	27	26	18	09	14	27	14	14	14	16	16
Grand Total	81	77	54	27	41	81	41	41	41	49	49

Source: Author's self-construct

A Holistic Organizational Outlook: “Think tanks of the BD Army always felt the necessity of a strong Special Force for the BD Army to respond against the perceived threat. Under the Forces Goal 2030, a long-term modernization and expansion program for BD Army has been started. Para Commando will be employed in wartime to fulfil the complex and delicate operational needs of the field formations throughout the country.

Figure-6: Wartime Employment of Para Commando

Program	Short Term Plan	Mid Term Plan	Long Term Plan	Responsibility
Year	2023-2027	2028-2032	2033-2037	
Doctrine and Joint Doctrine for Special Forces	√	√		MO, MT Dte, AHQ, ARTDOC, Para Cdo Bde, SW Wing
Research and development		√	√	MO, MT Dte, AHQ, ARTDOC, Para Cdo Bde, SW Wing
Acquisition of modern weapons, communication and special equipment		√	√	MO, MT, IDT Dte, AHQ, ARTDOC, Para Cdo Bde, SW Wing
Short and long-term raining plans	√	√	√	MT Dte, AHQ, ARTDOC, Para Cdo Bde, SW Wing
Joint Exercise with formation and training exchange friendly countries	√	√	√	MO, MT Dte, AFD, AHQ, ARTDOC, Para Cdo Bde, SW Wing
Infrastructure development	√	√		MO, MT Dte, AHQ, ARTDOC, Para Cdo Bde, SW Wing

Source: Author's self-construct

Infrastructure and Capability Development: Providing quality and standard training has become difficult as the Special Warfare Wing and School of Infantry and Tactics are over-tasked due to a shortage of instructors and training infrastructures. Therefore, infrastructure development under a viable command structure is important. Following are the infrastructures which can be established immediately:

Figure-7: Proposed Infrastructures of Para Commando

Training	Required Infrastructure	Approving Value
Advance Free fall Training (HALO, HAHO and Tandem)	Wind Tunnel	30,00,00,000 Tk
	Control Simulator	4,00,00,000 Tk
Jungle Survival and Combat Tracking	Survival Village	8,00,00,000 Tk
Advanced Counter Terrorism Raining	Multipurpose Counter Terrorism Training Bldg	8,00,00,000 Tk
CIED Village	CIED Training	8,00,00,000 Tk
Aircraft for Practice in Cantonment	Outdated Aircraft	-
Shooting Training	300m all Weather Hard Surface Firing Range	5,00,00,000 Tk

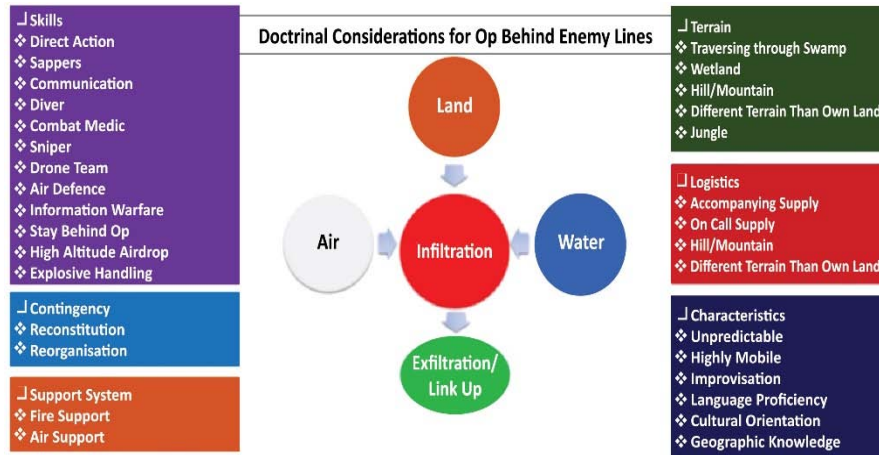
Source: Author's self-construct

Structuring of Doctrine: At this point, there is a need for deliberate doctrinal and policy guidelines on how the Para Commando will be organised, equipped, and employed. This doctrine for SF's operation will guide the army to determine the

Employment of Para Commando as Part of Asymmetric Warfare...

elements of modernizing SF in terms of weapons, equipment, technology, organization, forces' structure, and training. Later, a Joint SF doctrine will also be required.

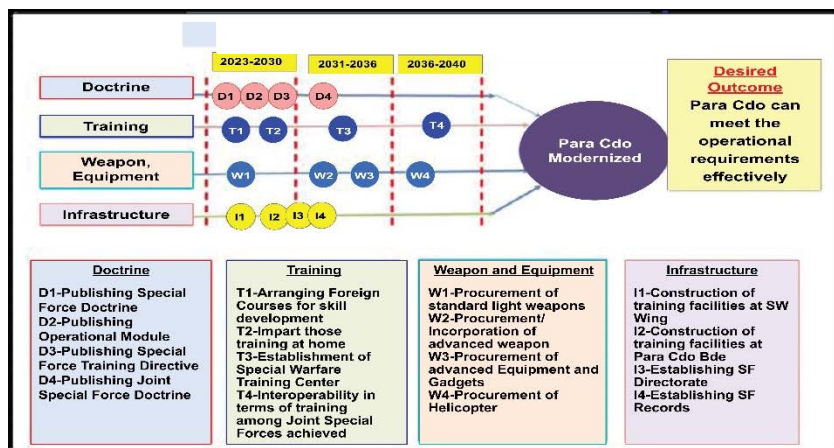
Figure-8: Structuring of Doctrine



Source: Author's self-construct

Force Structuring and Modernization: Para Commando needs a roadmap for modernisation. Due to the inadequacy of the defence budget, it is difficult to equip the Para Commando with the required advanced systems. However, there is no alternative to acquiring advanced systems for SF. It is essential not only that these forces are as technologically advanced but also that they are effective.

Figure-9: Roadmap for Modernisation



Source: Author's self-construct

Organising Coordinated Training: Military Training (MT) Directorate, Army Training and Doctrine Command (ARTDOC), Special Forces Brigade Headquarters,

Special Warfare (SW) Wing, and Special Forces Units may carry out an integrated drive for training and development. Special Forces Brigade and Special Warfare wing may develop the practices, field manuals on Special Forces' operations, tactics and handbooks on different drills and procedures on the conduct of special operations. This top-down approach to training development will allow the Special Forces to achieve basic, advanced, and professional military training.¹¹ The proposed courses can be conducted abroad at first and then at home.

Figure-10: Proposed Courses

Course	Remakes
Advance Freefall Course	All foreign course/trading should be conducted considering same geographical location of the country. All courses should be conducted at home after 2030
Jungle Survival and Combat Tracking Course	
Special Reconnaissance Course	
Mountain Warfare Course	
Advance Counter Terrorism Training	
Counter Improvised Explosive Devise Course	
Sniping Course	
Demolition Course	
Scuba Diving Course	
Combat Medic Course	
Language Course (Arabic, French, Burmese, Hindi, Urdu etcetera)	

Source: Author's self-construct

Effects Achieved after adopting the measures

Deterrence is one of the main pillars of defence policy. BD must continue to have a “credible deterrent force” to protect its independence and integrity. Special Operations conducted by SF are also a plausible option to create credible deterrence. Special Forces are tools of national policy.¹²

Para Commando will employ methods and operational ideas that are unusual, unorthodox, and unanticipated by the adversary. Special operations forces can surprise their adversaries using an indirect approach. Surprise is the most critical factor influencing battle outcomes, by some accounts equaling a force ratio of up to 2000:1. Charles Foley describes in his book ‘Commando Extraordinary how a German Commando Otto Skorzeny rescued Benito Mussolini, the deposed dictator, from his Italian guards atop the highest Apennine summit; how he abducted Admiral Horthy, the Hungarian Regent, from his palace in Budapest by surprise.¹³

Para Commando is a tool that provides options for the BD Army to assume an offensive posture based on the situation. In the doctrine of the BD Army, the possibility of conducting a limited offensive is mentioned. SF provides the

government with many cost-efficient and effective capabilities and options outside the normal military context and capability set.¹⁴ The basic idea at the core of special operations is to achieve large effects with a small input in terms of forces, mainly through extreme precision in applying force against an opponent's critical vulnerabilities.¹⁵

Figure-11: Effects of Employing Para Commando in AW

Ser	Effects	Validated By (Also Supported by Data)
1.	Achieve time sensitive results	LR, CS= Vermok raid, FGD-1, I=QMG
2.	Interdiction of enemy Line of Communication, reserve etc	LR, CS= Jedburg, FGD-2, I=GCO, ARTDOC
3.	Obtain/ verify information concerning operational environment and threat	LR, CS= Vermok raid, FGD-1, I=1 st Ranger of BD
4.	Act as force multiplier	LR, CS= Jedburg, FGD-2, I=Comdt, SI%T
5.	Accelerate pace of success	LR, FGD-1= Brigadier Zohur, 1 st CO of 1 PCB
6.	Attain strategic or operational objective to that enemy course of Action	LR, CS= Vermok raid, FGD-2, I= GCO, ARTDOC
7.	Prepare/Shape the battlefield for decisive engagement by conventional forces	LR, CS= Operation Jackpot, FGD-1
8.	Seizing and sustaining the initiative	LR, CS= Operation Truthful Promise
9.	Can raise the morale of force	LR, CS= Operation Jackpot, FGD-1, I=GCO, ARTDOC
10.	Achieve psychological ascendancy over enemy	LR, CS= Vermok raid, FGD-2
11.	Accomplish a mission at low strategic and political cost	LR, CS= Vermok raid, Operation Jackpot, GCO ARTDOC
12.	Achieve synergy of resources in deep op area	LR, CS= Chindit Operation, FGD-2
13.	Reduce pressure on conventional forces by engaging enemy and creating for and friction	LR, CS= Operation Jackpot, FGD-1
14.	Destruction of high-value targets and critical resources	LR, CS= Jedburg, FGD-2, I=Commander, Para Cdo Bde
15.	Create fog and friction in coordination with unconventional forces, drone warfare etc	LR, CS= Jedburg, FGD-1, I=CO, 1PCB
16.	Discredit enemy narrative and promote friendly objectives	LR, CS= Vermok raid, Operation Jackpot, FGD-1
17.	Gain and maintain freedom of action	LR, CS= Vermok raid, FGD-1
18.	Achieve overwhelming concentration with minimum time	LR, FGO-2, I= DMO
19.	Can force the enemy to divert resources	LR, CS= Vermok raid, FGD-1, I=DMO
LR= Literature Review, CS= Case Study, I= Interview		

Source: Author's Findings

Conclusion and Recommendations

Bangladesh is most likely to be involved in an Asymmetric scenario against a stronger adversary where she will have to exploit some indirect approaches. In this regard, Para Commando specialises in exploiting the enemy's vulnerabilities, thus, making an excellent means of the indirect approach. However, Para Commando is a newly formed BD Army formation. It is yet to flourish adequately to contribute to its optimum potential. The benefits of effective employment of Para Commando are mainly threefold: first- enhancing the credible deterrence of the BD Army; second, adding a force to be reckoned with in the inventory of the Army to influence the battle

in all battlefield frameworks, and finally providing an opportunity for a decisive blow to the enemy through an indirect approach. Para Commando can perform specific roles: Direct Action, Special Reconnaissance, Achieve Synergy with UCWF in Deep Operational Areas, Psychological Warfare, Area Interdiction, Power Projection, Sensing Deep in Time and Space, Combat Recovery, etcetera.

Based on the situation in BD, having identified the roles of Para Commando, determining the opportunities and challenges of employing SF is the primary concern. Despite possessing many opportunities and advantages, effective employment of Para Commando seems challenging. The opportunities are Expansion of Force according to Forces Goal-2030, Skilled Human Dimension, Indirect and Unorthodox Approach of Para Commando, Para Commando – a Weapon of Choice for the BD Army, etcetera. Conversely, the challenges are the Defensive Doctrine of BD, Lack of War Experience, Budgetary Constraints and Bureaucratic Complexities, Need for Modernization and Skill-Based Training, Barriers to Effective Interoperability, Knowledge Gap on Adversaries, Peripheral Focus on Complementing Conventional Operations, Absence of SF Doctrine and Joint SF Doctrine etcetera.

A few measures can be taken to effectively employ Para Commando in the AW scenario. A few mentionable measures are A Viable Command Structure for Interoperability, Honing the Skills of Para Commando, A Holistic Organizational Outlook, Infrastructure and Capability Development, Issuance of Doctrine, Force Structuring and Modernization, Organising Skill-Based Training, etcetera. These measures will allow Para Commando to create disproportionate effects in battlefield segments.

Based on the findings of the research, the following recommendations are made:

First, Army Training and Doctrine Command, in coordination with Military Operations, Military Training Directorate, Para Commando Brigade, and related stakeholders, may include a chapter on AW in the doctrine for Special Force and publish it by 2023. Second, the Military Operations directorate may coordinate and work with the Master General of the Ordnance's Branch, Inspection and Technical Development, Military Training, Weapon, Equipment & Statistics, and Infantry Directorate to equip Special Forces with modern gadgets and weaponry to enhance their skills and performance. Third, Army Training and Doctrine Command may establish a separate Special Warfare School by 2030. Fourth, Army Training and Doctrine Command may develop skilled-based training opportunities and infrastructures in collaboration with Military Operations, Military Training Directorate and Para Commando Brigade at home and abroad, preceded by a sound perspective plan. The perspective plan may be published and circulated by 2023.

Finally, Para Commando Brigade and Special Warfare Wing may develop a model to assess the effects of the employment of Para Commando on the battlefield.

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Brief Biography



Major S M Yasin Nur Siddiqui, BSP, psc, Infantry was commissioned from Bangladesh Military Academy (BMA) on 22 December 2010 with 63 BMA Long Course in the Corps of Infantry. He is a graduate of DSCSC, Mirpur. He achieved the coveted Chief of Army Staff Gold Medal at the end of his training in BMA. He has diverse experience serving in regimental, instructional and staff appointments in his career. He served as a Platoon Commander and Instructor at Bangladesh Military Academy. He also served in the United Nations Peacekeeping Mission in the Democratic Republic of Congo and the Central African Republic. Apart from the mandatory courses for his professional career, he attended the Potential Platoon Commanders' Course, Army Commando Course, Counter Terrorism Course and Legal Aspects of Combating Terrorism Course from the United States of America. Major Yasin has achieved the prestigious 'Bishisto Sheba Padak' for contributing to 'Operation Twilight' at Atia Mahal, Sylhet. Presently, he is serving as the Company Commander of 43rd Bangladesh Infantry Regiment.

Enhancing Professional Knowledge to Develop Competence of Junior Officers in Bangladesh Army: An Organisational Approach

Major S M Raik Islam, psc, Infantry

Abstract

The research has been carried out to propose a systematic organisational approach to enhance the professional knowledge of the Junior Officers (JOs) of the Bangladesh Army to help develop their competence. Initially, the paper has specified the expected and existing level of professional knowledge of the JOs. To understand the gravity of the problem, the research has identified the reasons and negative impacts of insufficient professional knowledge of the JOs. Finally, the researcher proposed a set of organisational approaches to enhance the JOs' standard in this aspect. All these findings and recommendations were coded and quantitatively analyzed using statistical tools. In addition, they were also validated by interviewing a few senior officers holding important appointments in Bangladesh Army. In the process, the researcher proved the hypothesis—A systematic organisational approach will enhance professional knowledge for the competence development of the JOs in the BD Army.

Introduction

Junior officers (JO) are the driving force of an army. By their direct leadership role, therefore, developing JOs' competence remains at the forefront of an army's training objective. Bangladesh Army (BA) also develops its JOs as competent and visionary military leaders infused with essential character, qualities, skills, and knowledge through arduous training.¹ Inarguably, the competence developed at the direct leadership level will take on different nuances at the organisational and strategic levels of leadership.²

Moreover, present-day challenges in BA are multifaceted. Diverse challenges also characterise the operational environment by upsurging volatility, uncertainty, complexity, and ambiguity in future battlefields.³ In coping with such complexities, the officer corps of BA must be adaptive, resilient, innovative, and persistent, regardless of rank and seniority.⁴ The prerequisite of combating such challenges lies in the professional competence of the officers.

Keeping the training objectives at the backdrop, BA has designed its officers' training in five stages. JOs undergo Foundation Stage Training at the formation and institutional levels.⁵ Though all training curricula emphasise the cognitive development of the JOs, there is still a void in the overall spectrum of JOs' professional competence. Analysis of the recent performance of the JOs of BA

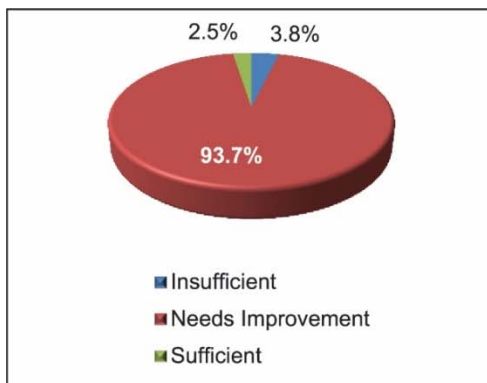
concerns its senior leadership.⁶ It manifests that the professional knowledge of the JOs is not evolving as expected.⁷

Against this backdrop, the paper has initially evaluated the present state of professional knowledge of the JOs in BA. Thereafter, the reasons behind the present state of professional knowledge and its impacts on the competence of the JOs have been analysed. Finally, the paper has proposed a Progressive Professional Knowledge Development Programme and restructuring of existing means of enhancing professional knowledge as part of a systematic organisational approach.

Evaluation of Present Standard of Professional Knowledge vis-à-vis Competence of JO in BA

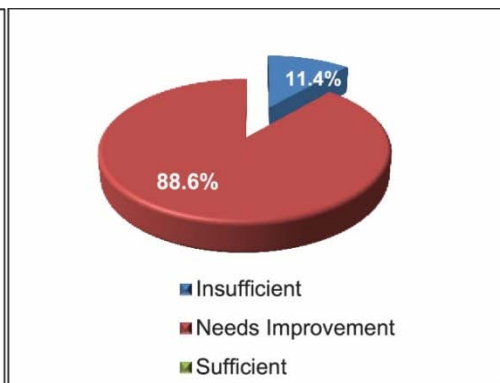
BA continuously trains its men and outfits to enhance professional knowledge and maintain the operational capability in the changing environment.⁸ Yet, the JOs lack competence due to underdeveloped professional knowledge. The survey conducted by the researcher shows that 93.7% of Commanding Officers (CO)/Officers Commanding (OC) opined that the competence of the JOs “needs improvement”. 88.6% of CO/OCs also opined that the reason for the declining competence of JOs lies in their insufficient professional knowledge. However, in doing so, Chapter II will endeavour to measure the state of professional knowledge and identify the areas where competence development is most affected.

Figure-1: Response of CO/OCs on Level of Competence of the JOs in BA



Source: Author's self-construct

Figure-2: Response of CO/OCs on Professional Knowledge of the JOs in BA



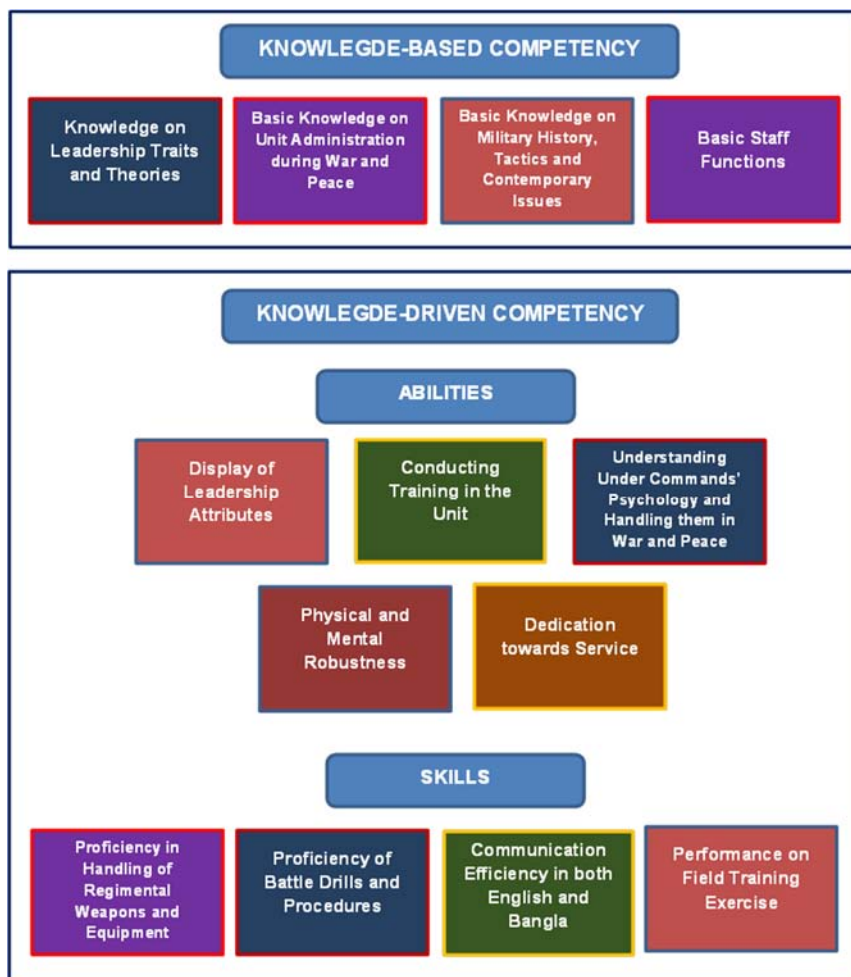
Source: Author's self-construct

Evaluation of the State of Competence and Professional Knowledge of JOs

The performance of JOs in different assignments reveals a sharp decline in their competence.⁹ Through content analysis and KII, a parameter was delineated to assess

the competence vis-s-vis professional knowledge of the JOs (Figure 3). Survey data on those parameters shows that, except for the case of Basic Staff Functions, most of the CO/OCs opined that JOs knowledge-based competence needs improvement. JOs' performance in recent years reveals a decline in their abilities.¹⁰ Approximately 40% of CO/OCs opined that JOs knowledge-based competence needs improvement, and another 40% of CO/OCs opined that the standard is merely satisfactory. Given the present state of competence, the professional knowledge of the JOs needs attention. The result shows that 88.6% of CO/OCs have opined that professional knowledge of JOs "needs improvement". Details are shown below:

Figure-3: Indicators of Professional Competence of the JOs in BA



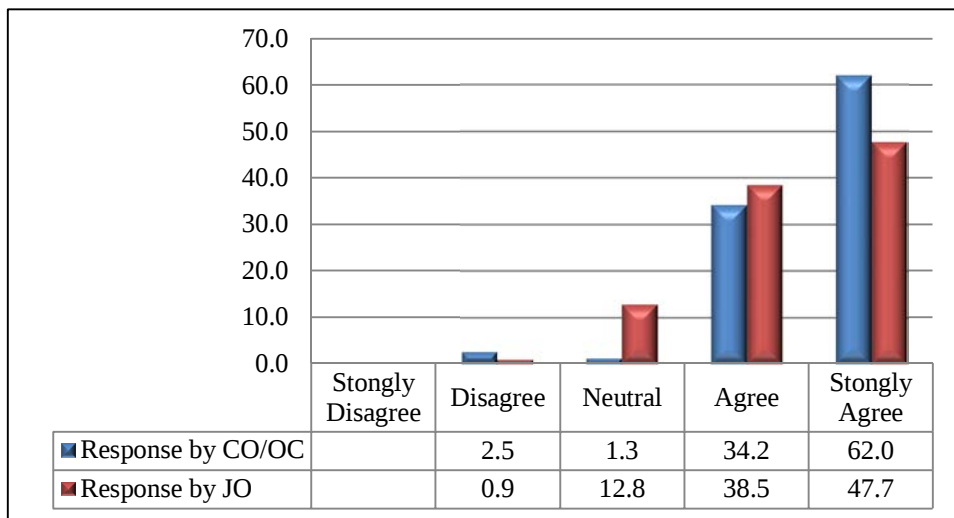
Source: Author's construct based on content analysis and KII

Analysis of the Reasons for Declination of Professional Knowledge of JO in BA

Reasons behind Inadequate Professional Knowledge of the JOs

Insufficiency in Systematic Organisational Approach: Professional development of the JOs is an organisational responsibility achieved by institutional training, formation training, and self-development.¹¹ In modern armies, self-development is also structured. The U.S. Army has been following Self-Development Module for JOs and all ranks to bridge the operational and institutional domains.¹² Indian Army, though, does not have a written self-development module; however, formation commanders usually bring out officers' development programmes.¹³ However, no systematic approach is established for knowledge development except for General Training Needs as delineated in Army Training Doctrine-2011. In the survey, it is evident that 62% of CO/OCs and 47.7% JOs have opined insufficient organisational approach for developing professional knowledge of the JOs.

Figure-4: Response Showing Opinions of CO/OCs and JOs on Insufficiency in Organisational Approach for Professional Knowledge Enrichment



Source: Author's self-construct

Absence of Organisational Culture and Professional Environment: Organisational culture is a system of shared meanings held by members. It refers to common ways of understanding the environment, values, priorities, subconscious convictions, ideas, interpretations, and standards.¹⁴ In BA, the culture of a knowledge-driven society is yet to evolve, at least in the case of JOs. Knowledge enrichment gets the lowest priority in most units.¹⁵ There is hardly any compulsion to enhance professional

knowledge and pursue excellence. The survey result also shows that units and formations lack organisational culture and professional environment as follows.

Memorisation-based Learning in the Courses: The course curriculum for the JOs has undergone several reforms. However, it has not come out of memorisation-based learning. More so, officers are credited for their memorisation-based performance.¹⁶ On the contrary, memorisation-centric learnings inhibit cognitive development. Survey data also shows that memorisation-based learning in the courses retards professional knowledge growth.

Absence of Proper Mentoring of JOs in the Units: JOs need proper mentoring by the mid-level officers of the units or by the CO himself. But due to the shortage of officers, mentoring is not taking place in the units.

Grading Biasness: Grading biasness in the courses impede the enrichment of professional knowledge. Good grading is a pre-requisite for subsequent posting in various training institutions and headquarters. Some officers take this as a motivation and work hard to gain good grades in the courses. To achieve this, those officers prioritise the lessons and memorise only important aspects for examinations, which inhibits the ultimate purpose of learning.¹⁷

Ineffective Feedback Mechanism: The feedback mechanism on the weakness in any course is reflected in course reports. However, most course reports do not accurately picture weaknesses.¹⁸ Again, whatever is mentioned in the course report is hardly taken care of in the units or formations arguing that officers miss the opportunity to improve in their specific areas of weaknesses.

Inadequate Time for Personal Study and Self-improvement: Commanders and leaders must establish a self-development-friendly environment and motivate their men.¹⁹ However, the present officers' state in the units does not allow CO/OCs to permit separate time for personal study.²⁰ JOs are performing responsibilities of more than two appointments. They have to spend personal time on official jobs; thereby, they cannot manage time for self-development.²¹

Improper Time Management and Fascination with Social Media: JOs, in most cases, do not make proper time management, thereby spending more time in the office. Moreover, maximum JOs are fascinated by social media and online entertainment platforms, which kills their time. Survey data shows that 93.7% of COs/OCs and 81.7% JOs have opined that JOs cannot enhance professional knowledge due to improper time management.

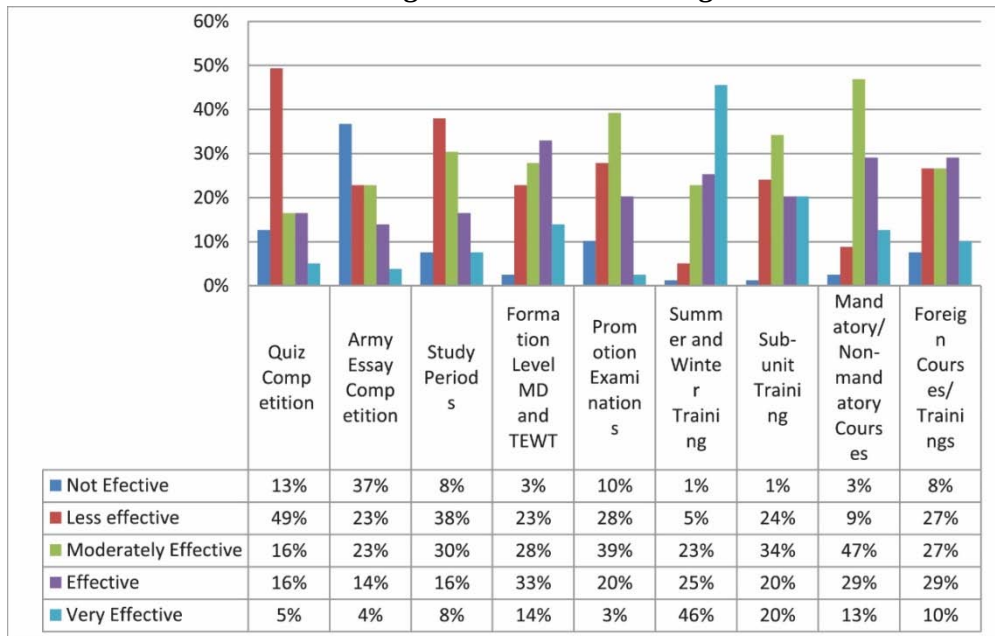
Lack of Interest and Initiative: Chief of Army Staff (CAS), BA in his Training Directive 2022, repeatedly emphasised progressing with a learning attitude, which necessitates interest-taking. However, JOs take less interest in enhancing professional

knowledge.²² They also do not utilise libraries, read magazines and newspapers, read books, and hone skill development.²³ Instructors of training institutions have also opined that, except for a few, most of the JOs take less initiative to prepare them for courses like Officers Basic Course (OBC), Officers Weapon Course (OWC), Junior Command and Staff Course (JCSC), etcetera. Survey data shows that 80.6% of COs/OCs have opined that JOs seriously lack interest and initiative to enhance their professional knowledge.

Evaluation of the Existing Means of Professional Knowledge

There are several means to enhance the professional knowledge of the officers in BA. Apart from structured training, there are several non-structured and non-training means to develop professional knowledge. For example, organizing book reviews, presentations on small topics like current affairs, writing essays, PEs, etcetera. However, such events fail to raise the standard of competence and professional knowledge of the JOs. The details of the survey are shown below:

Figure-5: Response of CO/OC on Effectiveness of Existing Means of Enhancing Professional Knowledge



Source: Author's self-construct

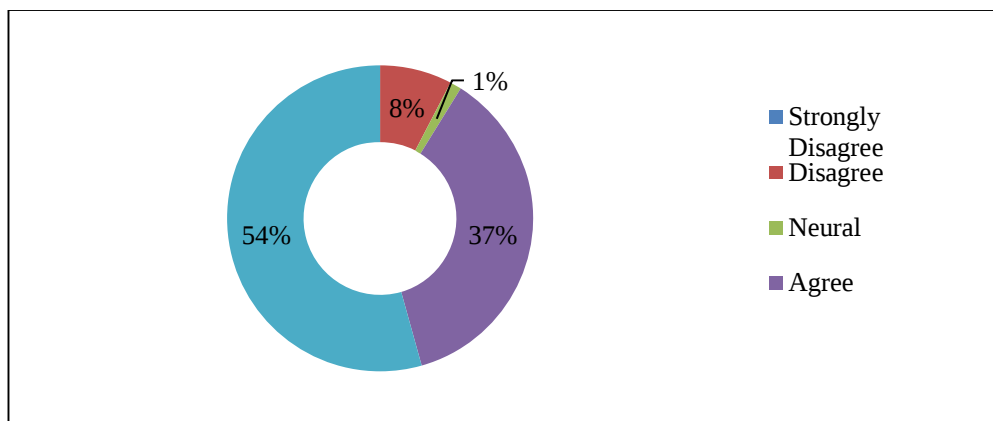
Existing means of enhancing professional knowledge do not generate interest amongst the JOs.²⁴ They also do not get much time for preparation, and they merely participate under compulsion. Courses are not designed realistically and fail to engage in cognitive activity.²⁵ JOs also argued that events like Quiz Competition are organised in a prototype

manner, and JOs' interests are not well taken care of. Again, the question patterns of PEs have become predictable, which does not require prior preparation to qualify.

Impacts of Insufficient Professional Knowledge on the Competence of JO in BA

A decline in the level of professional knowledge of JOs has long-term effects. Once the JOs grow up in the service, they must aid the leadership at different levels. Again, some of them will have to be coveted with leadership responsibilities in future. That is why the cognitive development of the JOs is significant. It is argued that an endeavour to enhance professional knowledge will help develop the mental faculty of the JOs; failure to do so will hamper the development of the JOs. Lack of professional knowledge will also retard their confidence, affecting decision-making. Inadequate knowledge and resulting incompetence also negatively affect the officers' career progression. As such, the declining state of professional knowledge will make them ineffective leaders.²⁶ Survey data shows 91% of COs/OCs have opined that competence depends on professional knowledge, and its decline severely impacts competence development. Details are as follows:

Figure-6: Response of CO/OCs on Impact of Insufficient Professional Knowledge



Source: Author's self-construct

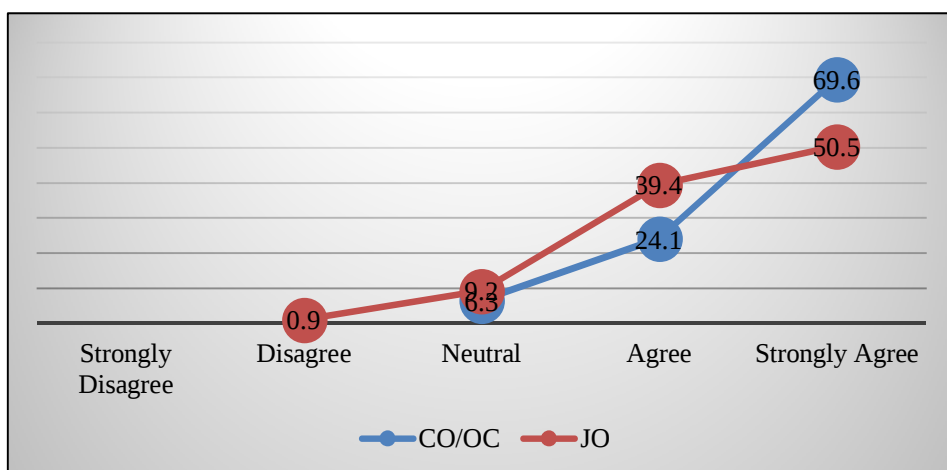
First, foresightedness is the most crucial leadership skill in the 21st century. Due to a lack of foresight, JOs do not plan their tasks as per priority; they fail to accomplish timely. They also lack prudence pertinent to their service lengths due to insufficient professional knowledge.²⁷ Second, the effectiveness of the JOs in the units is felt by their presence. Competent JOs generate positive energy for the units. On the contrary, the lack of competence of JOs due to a deficiency of professional knowledge turns them into ineffective leaders. Moreover, they cannot bring about positive changes, and they fail to create an impact on those under command.²⁸ Third, quick and timely

decision-making is an essential quality of an officer. The prerequisite of sound decision-making is adequate knowledge of the subject. As JOs lack professional knowledge, they tend to procrastinate in making decisions, which reduces their credibility.²⁹ Fourth, the key to the solution to the military problem lies in the military commander's professional maturity and judgement arrived at by his study and practice of his profession.³⁰ But due to a lack of professional knowledge, JOs cannot develop the leadership qualities necessary for success. Fifth, up to mid-level officers, the significance of good grading in the course is enormous. Postings at instructional appointments, headquarters, command-assignments, etcetera largely depend on good course grading. If officers do not get good postings at instructional and staff appointments, their career progression is likely to be hampered.³¹

Systematic Organisational Approach to Enhance Professional Knowledge of JO in BA

It is now well-established that insufficient professional knowledge of the JOs negatively impacts their competence development. In this regard, the inadequacy of a systematic organisational approach has been identified as the principal reason. Hence, a systematic organisational approach may be undertaken to facilitate professional knowledge enrichment of the JOs. Moreover, as an organisation, the military is also responsible for ensuring the development of its officers.³² Survey results shown below also indicate that most of the respondents opined for the necessity of delineating a systematic organisational approach:

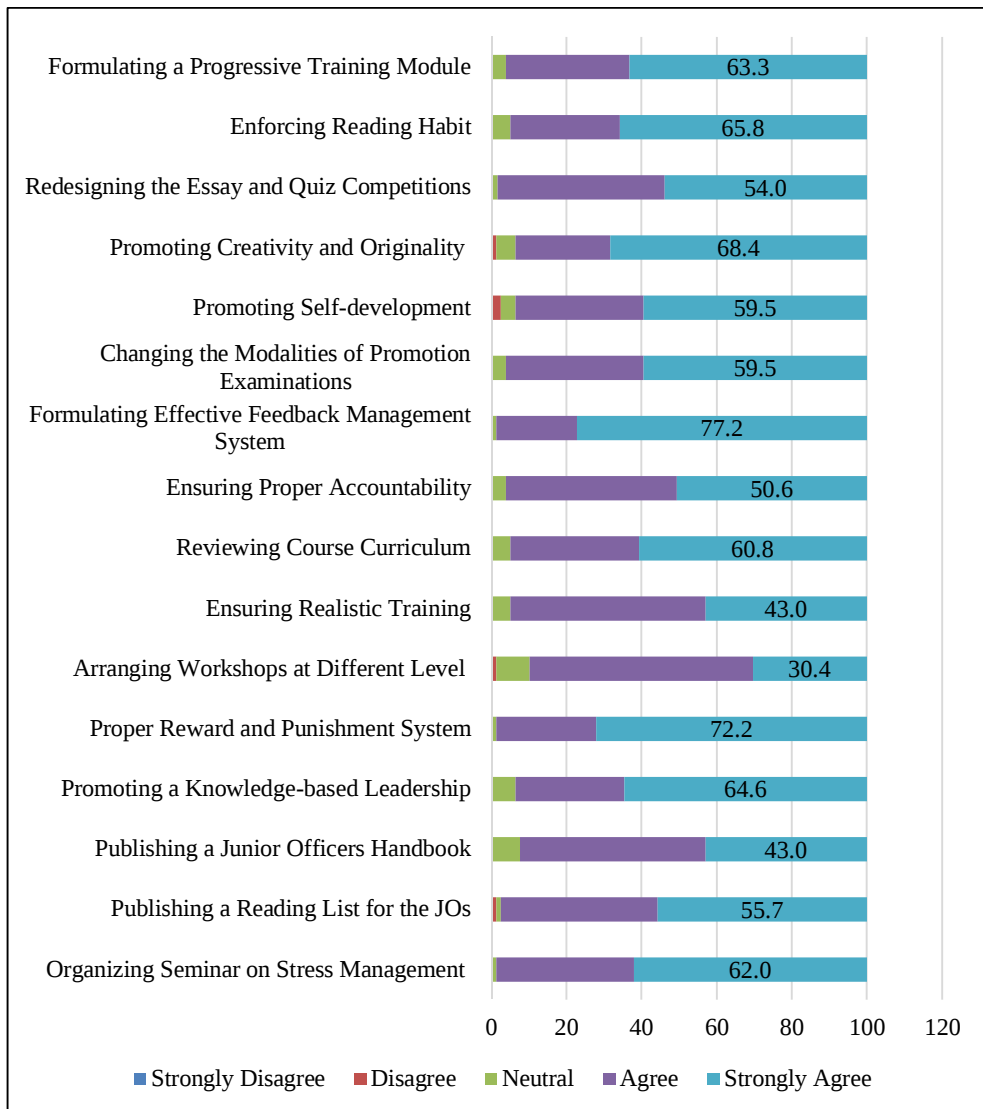
Figure-7: Response Showing the Opinion of CO/OCs and JOs on the The Necessity of Delineating Systematic Organisational Approach



Source: Author's self-construct

The researcher, based on the findings of FGD, interview, and literature review, has put forward a few measures to ensure the appropriate organisational approach to enhance the professional knowledge of the JOs. In most cases, respondents agreed to the proposed approaches. The findings of the survey are shown in Figure-8 below:

Figure-8: Response Showing the Opinion of CO/OCs on the Proposed Organisational Approaches

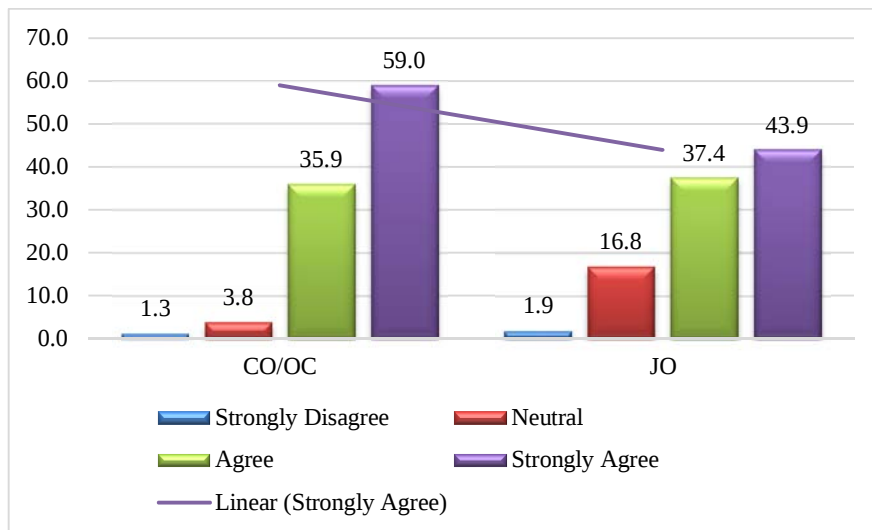


Source: Author's self-construct

Formulating a Progressive Module for Enriching the Professional Knowledge of the JOs

BA does not have a professional knowledge development module for the JOs. Moreover, the unit environment does not promote knowledge-based junior leadership. Therefore, a structured “Progressive Professional Knowledge Development Programme (PPKDP)” with clearly defined objectives and means will be of enormous significance for the JOs. The survey result below also shows the necessity of promulgating such PPKDP for the JOs:

Figure-9: Response Showing the Opinion of CO/OCs and JOs on the Necessity of Formulating PPKDP



Source: Author's self-construct

The PPKDP can be developed based on the yearly progression of the service. There can be different Age Groups (AG). Specific Knowledge Requirements (SKR) can be determined for each AG. Moreover, particular objectives and means to attain those need to be delineated in the broad guideline of the PPKDP. The researcher endeavoured to determine the AG for selecting SKR through the survey. Furthermore, PPKDP can focus on Specific Knowledge Requirements (SKR) for the identified AGs. The existing model of ‘Training Needs’ delineated by *The Draft Army Training Doctrine* can be considered a guideline for determining the ‘Must Know’, ‘May Know’, and ‘Should Know’ lessons for the JOs.³³ However, the scope can further be expanded to address present-day challenges. Considering the commitments in the units, more practical and achievable goals must be set for the JOs. The PPKDP must

have relevancy and be time sensitive. The schematic of the ‘Desired Characteristics’ of the Programme is shown below:

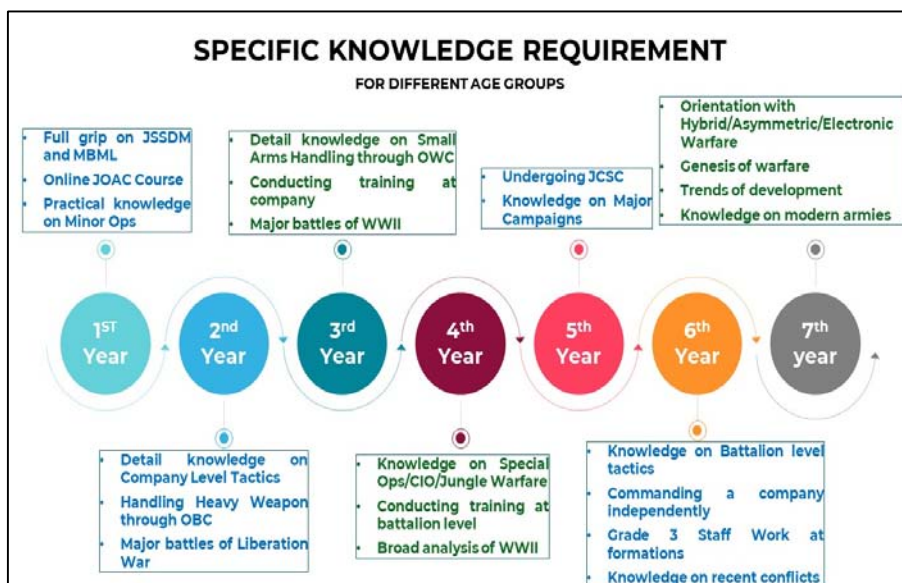
Figure-10: Characteristics of the Proposed Model



Source: Author’s self-construct

The SKR will be attained through the proposed and existing means of training and performance of regular military duties. Apart from the existing ones, a few tangible means need to be incorporated to assess the professional knowledge of the JOs. These may also work as the driving force for pursuing excellence by the JOs.

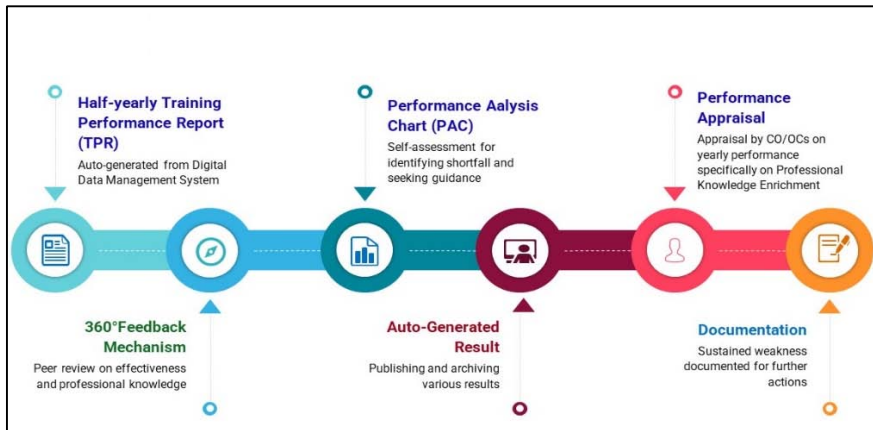
Figure-11: Specific Knowledge Requirement (SKR) for Different Age Groups



Source: Author’s self-construct

The lack of effective feedback mechanisms has been identified as one of the most significant barriers to enhancing the professional knowledge of the JOs. Figure-11 below shows that 77.2% of the respondents strongly agreed that an effective feedback mechanism would be instrumental to the overall development of professional knowledge. The following options can be effective for a comprehensive Feedback Mechanism:

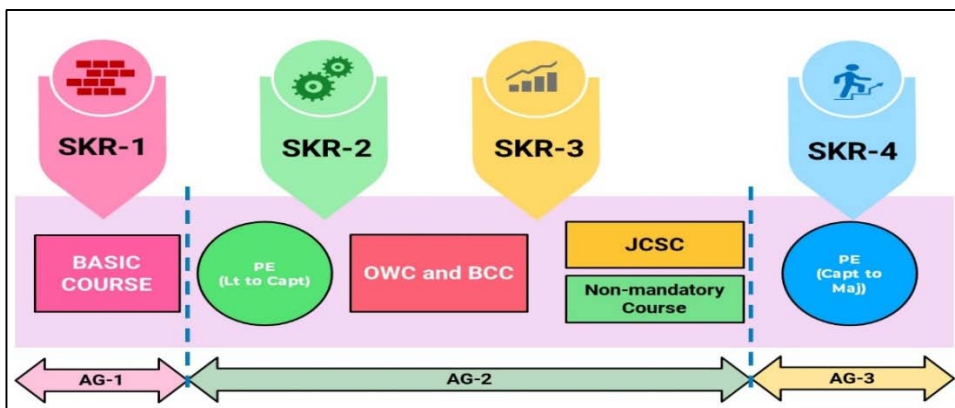
Figure-12: Evaluation and Feedback Mechanism for PPKDP



Source: Author's self-construct

KIs have expressed concern about implementing a new programme amid existing systems. The module must fit into the existing training plan and make the best use of the cushion periods between the mandatory courses. This will not only make a bridge in the learning but also ensure proper time utilisation for the JOs. A schematic below shows the tentative plan for integrating the proposed model:

Figure-13: Implementation Model for PPKDP



Source: Author's self-construct

Revitalising Existing Systems of Knowledge Enrichment

Presently, Quiz Competition does not necessitate a JO to be an avid reader in the quest to enhance knowledge. Therefore, to generate interest in the JOs, the competition can be more challenging and rewarding. A separate question bank can be prepared for the JOs, which should only serve as a tool, while bulk emphasis can be placed on selected reference materials. All JOs must participate in the competition.

Furthermore, the Army Essay Competition can be made compulsory for the JOs at the formation level. Topics can be selected and intimated to the JOs well before. Finally, competition can be held in an examination mode. Selected JOs can participate in the Army Essay Competition. Formation magazines can be published to encourage writing by the JOs. The survey result shows the opinion of the CO/OCs on different actions for restructuring the competition.

At present, PE for JOs aims to test professional knowledge of military history, current affairs, military science, and legal affairs. JOs can qualify with minimal preparation utilising the old notes due to the stereotyped nature of the test.³⁴ A revision of the exam syllabus should incorporate the reading list and open-ended syllabi for military history and current affairs forcing the JOs to consult the books as a primary source.

It has been identified that JOs professional knowledge is not evolving as expected, even after undertaking several mandatory and non-mandatory courses. Significant reasons are grading biases of maximum JOs, lack of interest of a particular group of JOs, the inadequacy of interest-generating curriculum, and so on.³⁵ Hence, revising the course curriculum to make it more effective is necessary.

Finally, knowledge is best enhanced through interactions. Therefore, building a knowledge-based society with a free flow of knowledge is of immense importance. Seminars and symposiums focusing on the interest of the JOs can be arranged at regular intervals. Indian Army Area HQ arranges seminars/study periods in alternative weeks for the JOs.

Conclusion and Recommendations

JOs' competence is instrumental to the mission performance of an army. By and large, competence depends on the acquired knowledge of an individual. On the other hand, present-day challenges in the military spectrum of BD are multifaceted. These diverse challenges warrant JOs to be adaptive, resilient, and innovative. Developing a knowledge-based junior leadership is key to attaining such a benchmark.

Inadequacy of professional knowledge of the JOs is identified in their performance in the units, formations, and various courses. The researcher has identified different

parameters of professional knowledge, such as tactical knowledge, military skills, military history, knowledge of leadership and management, and staff duties. Most of the JOs display weakness in almost every criterion.

Inadequate organisational approach, lack of organisational pressure and professional atmosphere, ineffective feedback mechanism, and lack of initiative by JOs are the leading causes of the declination of professional knowledge. This problem is further aggravated by the lack of proper mentoring of junior officers, deterioration in reading habits, lack of time for personal study, grading biasness in the courses, etc. All these core issues must be addressed to improve the professional knowledge of the JOs in BA.

The researcher analysed the impacts of inadequate professional knowledge of the JOs on their competence. Due to insufficient professional knowledge, JOs lack foresight, effectiveness, motivation, and confidence. JOs also fail to develop leadership traits that affect their decision-making capabilities. Lack of sufficient professional knowledge also inhibits the cognitive development of the JOs. These impacts underline the necessity of reviewing the training system and formulating effective measures to improve the present state.

PPKDP making the best use of the existing training framework, and reviving the current practices will significantly enhance the professional knowledge of the JOs. Besides, promoting reading, hosting professional knowledge competitions, publishing formation journals, restructuring Annual Army Essay Competition, remodelling Quiz Competition, and implementing an effective feedback management system will motivate JOs to improve their professional knowledge.

Based on the findings of the research, the following recommendations are made:

First, Army Headquarters (AHQ), General Staff Branch (GS Br), and Military Training (MT) Directorate may conduct an in-depth study by June 2023 to formulate a module to address the declining state of professional knowledge of the JOs. The study may involve the Headquarters Army Training and Doctrine Command (HQ ARTDOC), AHQ, GS Br, Education Directorate, and training institutions, especially School of Infantry and Tactics (SI&T), to find the most feasible module for the JOs. The involvement of academic and psychological experts may also be considered for this purpose. After a detailed analysis of the problem by the experts, PPKDP may be formulated by October 2023 and executed from 01 January 2024 to expedite the professional knowledge of the JOs. The researcher's findings regarding the reasons in Chapter III and proposals can be considered while formulating the module.

Second, AHQ, GS Branch, MT Directorate may conduct a feasibility study by June 2023 on restructuring the modalities of the Quiz Competition. A more effective and analytical question pattern can be considered. Besides, Military History can be given more emphasis.

Third, AHQ, GS Branch, MT Directorate may conduct a study by June 2023 on the possible positive impacts of conducting the Annual Army Essay Competition as per service length categories to encourage more participation from the junior and mid-level officers. This study may be undertaken in consultation with the Education Directorate and ARTDOC.

Fourth, AHQ, GS Branch, and Education Directorate may carry out another feasibility study by December 2023 on the introduction of the “Formation Journal” to promote the writing skill of the JOs. This study may involve the active participation of the Military Training Directorate, Information Technology Directorate, and Education Directorate.

Fifth, in consultation with AHQ, MT Directorate, and IT dte, training institutions may develop their websites by December 2023. Pertinent lessons and guidelines for different courses can be uploaded there. Education Directorate can upload videos and commentaries on various campaigns and battles on the Army Website.

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Brief Biography



Major S M Raik Islam, psc, Infantry was commissioned from Bangladesh Military Academy (BMA) with 64 BMA Long Course in an Infantry Regiment on 22 June 2011. He is a graduate of DSCSC, Mirpur. He has diverse experience of serving in units, as a staff, and as an instructor. He served in the 5 Bangladesh Infantry Regiment (Support Battalion) in different regimental appointments. As an Instructor, he served as Instructor Class 'B' of the Tactics Wing in the School of Infantry and Tactics. He got the opportunity to serve under United Nations Peacekeeping Mission in MONUSCO (DR Congo) as Military Staff Officer at G3 Branch, Forces Headquarters. Presently, he is serving as the Company Commander of 5 East Bengal Regiment.

Riverine Air Defence Radar: A Viable Option to Complement National Air Defence

Wing Commander MD Zahid Ashraf, psc, GD(P)

Abstract

Bangladesh is crisscrossed with channels of rivers and their tributaries allowing access to the majority of districts through Inland Water Ways. The coastal water routes allow access to all the coastal districts. Air Defence of Bangladesh's airspace is the primary mission of the Bangladesh Air Force (BAF). The mission of the Navy relies primarily on seaborne assets. In the concept of riverine battalions, Bangladesh Army utilizes rivers for operational purposes. BAF has not used the river for operational purposes to date. BAF is acquiring Gap Filler Radars (GFR). Land-based GFRs face several challenges in terms of surveillance coverage, mobility, vulnerability, security, logistics, and personnel management, among others. A riverine air defence radar could mitigate many of these challenges. Consequently, a combination of land-based GFR and riverine air defence radar could provide a robust and adaptable Integrated Air Defence System. Bangladesh's shipbuilding capabilities enable the construction and maintenance of vessels with low life-cycle costs. The vessel can be constructed so that air defence radar can be fitted appropriately. The rivers' navigability enables air defence surveillance coverage across most of the mainland. Therefore, it is believed that the Riverine Air Defence Radar can be a viable option to supplement National Air Defence.

Introduction

Bangladesh Air Force is the main organization responsible for guarding Bangladesh's airspace. "Active Air Defence" and "Passive Air Defence" are two methods of air space defence strategies. The primary prerequisite for each of these methods is "Detection," which is achieved via visual sighting, infrared detection, conventional line of sight (LOS) radars, over-the-horizon radars (OTHR), and space-based detection systems. Conventional LOS Radars can be fixed, transportable, maritime, and airborne. Transportable radars are ground-based radars, also known as Gap Filler Radars or the GFRs.

Naval shipborne radars that operate in the water constitute the majority of maritime radars. With several navigable rivers and canals, Bangladesh is a unique riverine nation. Bangladesh Air Force could make use of this topographical advantage directly or indirectly when playing its many functions.

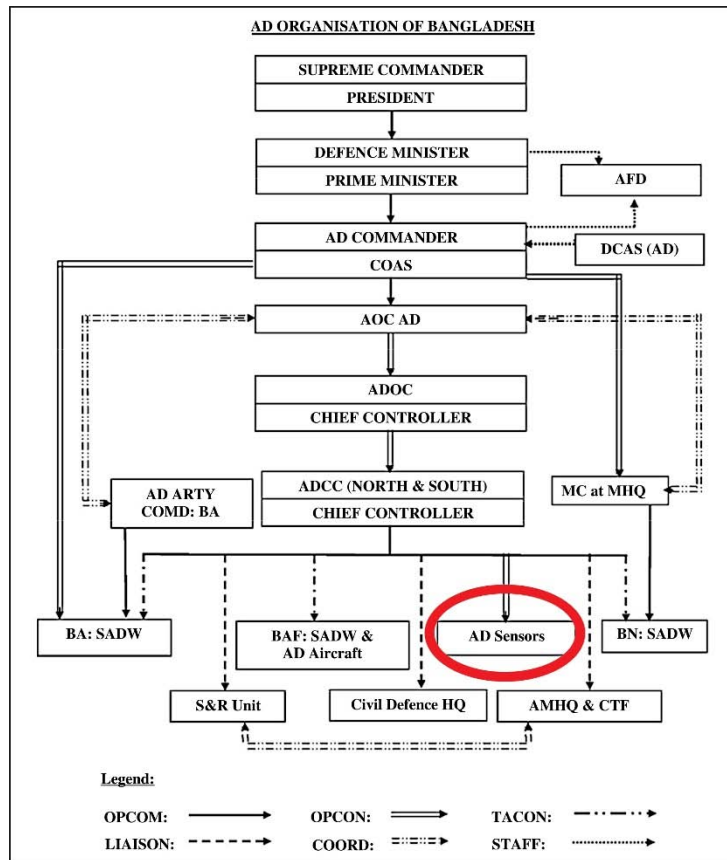
Riverine Air Defence Radar: A Viable Option to Complement National Air Defence

Because of the vehicle's size, form, and weight, the architecture and load-bearing capacity of the roads and culverts in upazila, unions, and villages in Bangladesh may significantly affect the mobility of GFRs. During the rainy season, the situation would get worse, particularly during a flood. The radar's ability to cover Bangladesh's aforementioned regions for aerial surveillance would be hampered by deployment restrictions. The restrictions might be more severe in Bangladesh's coastal regions, particularly in the south and southwest. The other solution might involve using GFRs on prepared surfaces close to national routes. As a result, since the radars would be used in fixed positions, the concept of mobility would be greatly diminished. Furthermore, installing a radar at the strategically significant St Martin Island would require a fixed location, which may not be practicable according to strategic leadership. Modern Precision Guided Munitions and the collateral damage they cause would be a threat to radars operating from fixed positions. To ensure the GFRs' employment off-base, sound and responsive logistical management would be a difficulty.

The Air Force Manual about Air Defence Weapon Controller Volume 1 describes deployment and placement principles for Air Defence (AD) Radar.¹ All operational and administrative issues for radar siting are outlined in the manual, although riverine platforms for siting radars in Bangladesh are not mentioned. In addition, the document does not list the issues and difficulties intrinsic to land-based GFRs. Draft National Air Defence Doctrine highlights three vulnerabilities in the Air Defence Ground Environment. These include vulnerability to ground, aerial, and electronic attacks.² The Forces Goal 2030 did not outline the integration of any shipborne Air Defence Radar that would allow the Air Force to exploit Bangladesh's wide riverine terrain.³ The scope of the study is to look into the problems with ground-based GFRs, the viability of an inland water or riverine platform equipped with AD radar to meet these challenges, the viability of river routes, the potential coverage by Riverine Air Defence Radar, and the radar's contribution to extending radar coverage. This paper aims to examine the potential of the riverine air defence radar as an additional means to the national air defence effort.

Challenges Associated to Land Based GFR in Bangladesh

Following its independence, Bangladesh has built a robust air defence system throughout the years. Command, Control, Communication, Computer, Intelligence, Surveillance, and Reconnaissance (C4ISR) system; air defence aircraft; Surface to Air Defence Weapons (SADW); concealment and deception; and civil defence are the primary components of Bangladesh's air defence systems.⁴

Figure-1: Air Defence Organization of Bangladesh

Source: DNADD, 2020

The GFR is an integral part of the AD sensors. Analyzing the system design, the critical requirements of a GFR could be categorized as follows:

- Operational: A secured prepared site, uninterrupted electrical supply, unhindered and free access via road to multiple sites, carriage vehicle/truck, integral generator, manpower, and resilience to survive during the war.⁵
- Maintenance: Skilled manpower, spares, tools, storage, and equipment.⁶
- Administration and Logistics: Accommodation, food, sanitation, ration, Petroleum, Oil and Lubricants (POL) and other logistics, miscellaneous financial operations at off-base locations.⁷

On careful scrutiny, the aforementioned critical requirements may be grouped into three main categories: mobility, vulnerability, and sustenance. Land-based GFRs are

at times susceptible to challenges associated with their critical requirements. The challenges are as follows:

Mobility: When installed on a vehicle, the radar cannot work while the vehicle is in motion. It also requires 15 minutes for encamping and decamping.⁸

Figure-2: Kronos Land GFR of BAF



Source: <https://www.google.com/search?q=Kronos+Land+GFR+of+bangladesh+air>

The radar remains static when in operation. Because of its size and form, 64 percent of respondents believe that the vehicle platform increases the risk of an accident while driving.

Requirement of Fixed Prepared Surface: The vast majority of those who took the poll are in agreement with the statement that land-based GFRs would need a specified and prepared hard surface to operate. 2% of respondents brought up an important point by pointing out that under certain seasonal circumstances, such as when it is the rainy season, the radar cannot be used without a properly hardened surface. On the other hand, it was established that the current GFR of the Bangladesh Air Force would not be able to function without a properly specified hardened surface throughout any of the four seasons that make up a year.⁹

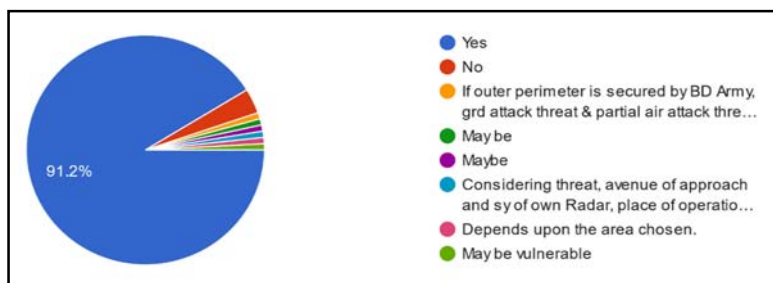
Limitation of Load Bearing Capacity of the Roads of Bangladesh: Roads in Bangladesh may be placed into one of six distinct categories according to their location. These categories include National Highways, Regional Highways, Zilla Roads, Upazilla Roads, Union Roads, and Village Roads. Six percent of the total number of roads that are accessible are made up of highways and Zilla roads. The

remaining 94% of roads are classed as either Upazilla, Union, or Village roads, and they have a maximum axle weight of 8.2 tons. As a result, it would be completely unrealistic to attempt to visit all of the destinations. The rainy season will make everything much more complicated. 71.9% of respondents said that access would be difficult through Upazila, Union, and Village roads.

Vulnerability: Vulnerable aspects are as follows:

Security: In general, designated locations of GFRs do not have multi-layered security systems and the GFRs are susceptible to ground assault.

Figure-3: Survey Response on Ground Attack



Source: <https://www.google.com/search?q=survey+response+on+ground+attack>

Vulnerability to Weapons: When used in conjunction with a Global Positioning System (GPS) or an Inertial Navigation System (INS), today's all-weather weapons can strike targets from a great distance with an extraordinary degree of accuracy. As a result, GFRs are still susceptible to attack from a variety of precise weapons. These types of munitions might include but are not limited to ballistic missiles, cruise missiles, anti-radiation missiles, air-to-surface missiles like the AGM-65, rockets, guns, artillery fire, micro munitions carried by unmanned aerial vehicles and small rocket launchers (LGBs), and so on. In addition, even if there was no direct strike, the GFR may still sustain considerable damage as a result of the collateral damage. A total of 87% of respondents think that GFRs might be harmed as a result of collateral effects.

Sustenance: The minimum personnel required for the Bangladesh Air Force is almost seven times higher than that of OEM (considering an operational deployment for 7 days). This is due to the unique composition of the Bangladesh Air Force. 85% of those who participated in the survey believe that substantial infrastructure, storage, and messing facilities would be necessary for conjunction with the prepared areas from which GFRs would operate.

Coverage: The majority of the roads in the southern and southwestern coastal areas of Bangladesh are upazila and union roads. The roads in zilla are also inadequate for accessing certain locations. South of Shyamnagar, Satkhira in the south-west area, there is no road till Patharghata in the east. Therefore, land-based radars cannot be used to expand radar coverage in that area to the south.¹⁰ In recent years, several islands have emerged south of the mainland in the Bay of Bengal. St. Martin is a favourable site for radar installation. There is no road link available. No specific location may be allocated by the Government of Bangladesh to the Air Force for the installation of a GFR on Saint Martin.¹¹ With vehicle-borne GFR, further southward coverage expansion would be constrained.

Viability of River and Riverine Platform to Overcome the Limitation

Bangladesh, the world's biggest delta, features flat terrain and riverine-textured soil. The river systems of this country have historically shaped the path of its population. Bangladesh has made substantial use of rivers for logistical management by various government entities.¹² However, the use of rivers by the Air Force has yet to be investigated. With the introduction of GFRs, the prospect may become a reality once the river's usefulness as a medium and the riverine platform's viability as a means are determined. For this research, the river's viability would be determined based on "Navigability" and "Reach". In addition, the viability of a riverine platform would be examined in light of the challenges that ground-based GFRs confront such as mobility, vulnerability, sustenance and coverage.

The viability of the river is briefly discussed below:

The word navigability refers to 'the degree to which an area of water is deep, wide, or safe enough for a boat to go through.'¹³ Bangladesh's interior waterways consist of the Jamuna (Brahmaputra), the Padma (Ganges), and the Meghna, as well as over 700 of their tributaries with a total length of around 24,000 kilometres. Approximately 6,000 kilometres of rivers are navigable during the monsoon and 3,800 kilometres during the dry season.¹⁴ The Inland Water Transport (IWT) network is currently categorized as stated in the table below:

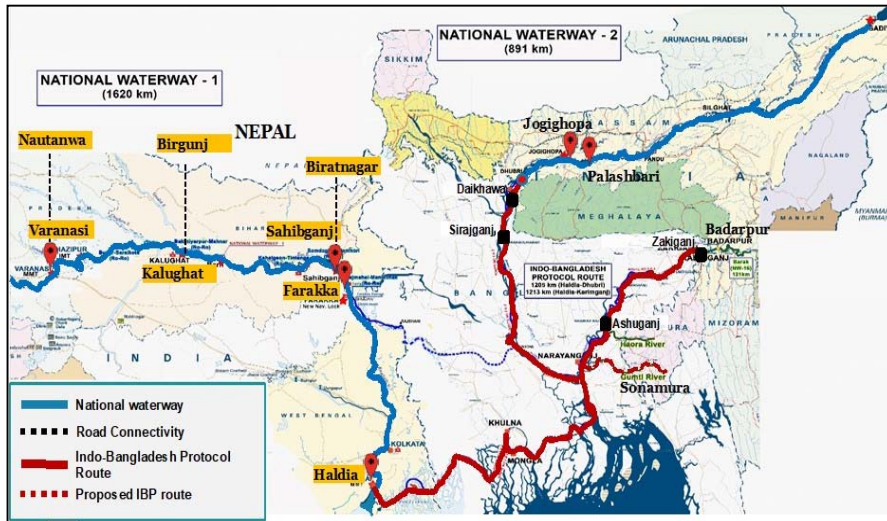
Table-1: Categorization of Inland Water Transport Network (BIWTA, 2009)

Class	Minimum Draught	Minimum Vertical Clearance	Minimum Horizontal Clearance
Class-I	3.66 m	18.30 m	76.22 m
Class-II	2.13 m	12.20 m	76.22 m
Class-III	1.52 m	7.62 m	30.48 m
Class-IV	Less than 1.52 m	5.00 m	20.00 m

Source: Author's self-construct

However, the situation has altered substantially over the years. Since around a decade ago, the Government of Bangladesh has made substantial measures to safeguard the navigability of rivers. With the revival of Indo-Bangladesh Protocol Channels (IBP), a large length of navigable river routes has been created.¹⁵

Figure-4: Indo-Bangladesh Protocol Route



Source: World Bank, 2022

Since the problem has been included in the Government's Sustainable Development Program (SDG), the current efforts to restore a river's navigability are quite promising. By 2030, the government plans to make 10,000 kilometres of rivers navigable; and by 2041, extend it by 18,000 kilometres.¹⁶ The Director of BIWTA's Department of Hydrography, Shamsun Naher, also stated that Catamaran-class ships may navigate to Sylhet, Kurigram, Kushtia, and all of Bangladesh south of Baghabari and Bhairab.

Approximately 65 percent of survey respondents believe that the Riverine AD Radar can reach the majority of districts, including coastal areas. Shamsun Naher also stated that during the dry season, even with 6,000 kilometres of navigable water, it is feasible to access about 65% of Bangladesh's districts, including nearly all of the coastline districts, using river routes. In addition, territorial waters are used to access island districts including Saint Martin Island. To these regions, BIWTA Sea Trucks and privately owned boats deliver both cargo and people.¹⁷

Viability of Riverine Platform

The majority of the respondents believe that the riverine platform could be a viable option to meet the challenges which are integral and unique in the context of

Bangladesh. There are numerous ships with enormous tonnages that traverse Bangladesh's river routes.¹⁸ For instance, the launches operating between southern districts and Dhaka are about 2,000-ton vessels.¹⁹ There are ships which navigate through both territorial water and inland water. Oil tankers, for instance, transport oil from Chittagong to Baghabari through territorial sea water and interior waterways. These vessels weigh more than 500 tons. Following river routes, these ships also bring oil to Narayanganj, Barishal, and Khulna. Under the Indo-Bangladesh Protocol Routes (IPB), 500 ton ships may also reach Nowapara in Jessore, Satkhira, and Khulna, as well as other coastal districts. The AD radar can be installed on indigenous ships which are 500 ton or even less.

The key concern is about the top weight of the radar. From the brochure, it was found that the top weight of KRONOS maritime radar is 977 kg. The other options are available in market weights lesser than KRONOS. For example, Columbus MK2 weighs about 300 kg, Thales weighs about 500 kg etc. Even a 1-ton antenna would not have a significant effect on the Centre of Gravity (CG) of the indigenous ships given the specification. Consequently, 2 x Frigates of Bangladesh Navy have been fitted with KRONOS Maritime. On query, Dr. Zobair Ibn Awal, a Professor of Naval Architect of BUET, confirmed that the structure and antenna construction would not pose any hindrance to installing the Air Defence Radar on indigenous ships of Bangladesh.¹⁹ However, he repeatedly iterated that the complete integration would require a joint effort by OEM of Radar and Shipbuilder. In that context, the researcher contacted one of the OEMs from Italy namely GEM ELETTRONICA Srl via email sending the photo of the two indigenous Catamaran Class ships plying within the inland waterways of Bangladesh. The manual of the KRONOS naval version also confirmed that any ship with a minimum of 500 tonnages can be fitted with KRONOS maritime radar.

Figure-5: Indigenous Ship which could Mount AD Radar



Source: Author's collection

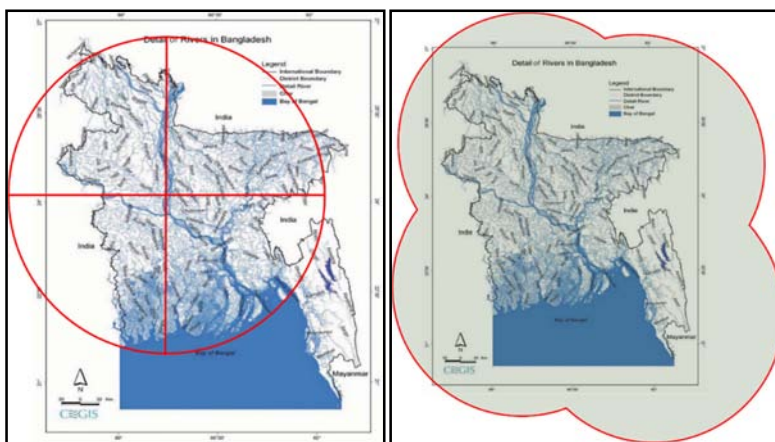
The Naval ships can keep the AD radar switched on all the time during voyages.²⁰ The similar would apply to inland water-borne ships once installed.

Maj Afian, the Weapon System Operator of F-18 and SU-30, was interviewed. The Maj confirmed that in a river, it is less probable to attack the ship either with Anti-Ship Missile or a TV-guided precision munition. The ship is also not vulnerable to any Ballistic or Cruise missile because of its mobility. Targeting an inland ship located in the river from a naval ship in the sea is not possible due to land clutter.²¹ However, the inland ship remains vulnerable as a Naval ship in the sea against Anti-Radiation Missiles. Thus, it may be inferred that inland ships fitted with AD Radar would remain less vulnerable to different weapons.

The 500 ton ship, when modified or built for AD Radar, could be designed to house 30-40 personnel including the operating and maintenance crew of the ship and the radar. The MV Green Line-2 is a ship weighing about 500 ton. Such ships can easily remain afloat with a 20-30 days ration and other logistics. With such sustainability, logistic management across the country from BAF bases would be convenient.²² The conventional and unconventional ground security threats would also be less than the ground-based system.

Bangladesh Air Force has bought KRONOS LAND GFR.²³ As per the brochure of the company published on its website of Leonardo, both KRONOS Land and KRONOS MARITIME have the same range at a high level i.e., 250 KM. Given that, the researcher has constructed the coverage of the high-level (HL) airspace considering KRONOS radar.

**Figure-6: HL Coverage of KRONOS Radar if placed at Baghabari and
HL Coverage Constructed by 5 x KRONOS Radar**

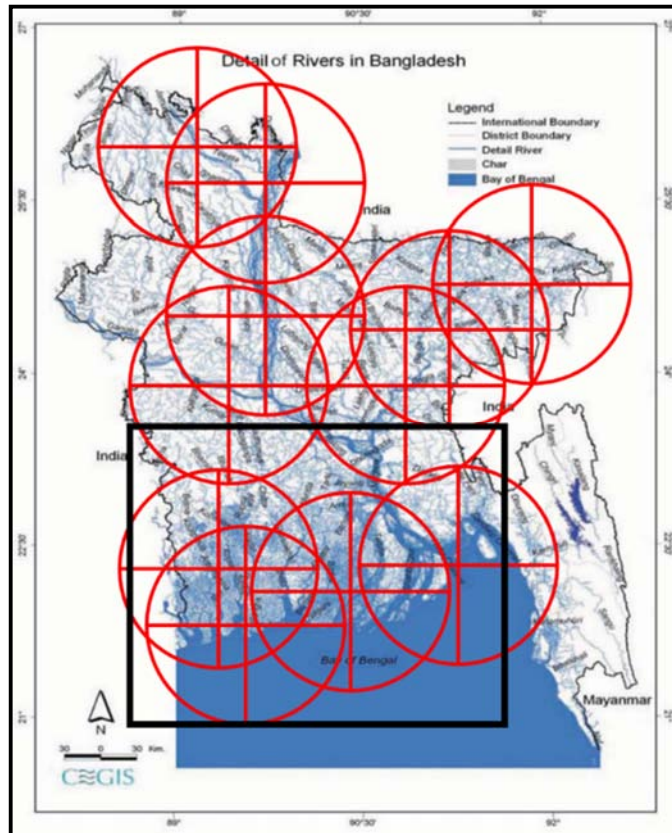


Source: <https://www.google.com/search?q=HL+Coverage+of+KRONOS+Radar>

Riverine Air Defence Radar: A Viable Option to Complement National Air Defence

Assuming, 80 KM reach like other Air Surveillance radar, the Low-Level (LL) coverage that can be constructed utilizing river routes is given below:

Figure-7: LL Coverage of KRONOS Radar that can be constructed



Source: <https://www.google.com/search?q=LL+Coverage+of+KRONOS+Radar>

Contribution of Riverine Air Defence Radar to the National Air Defence Effort

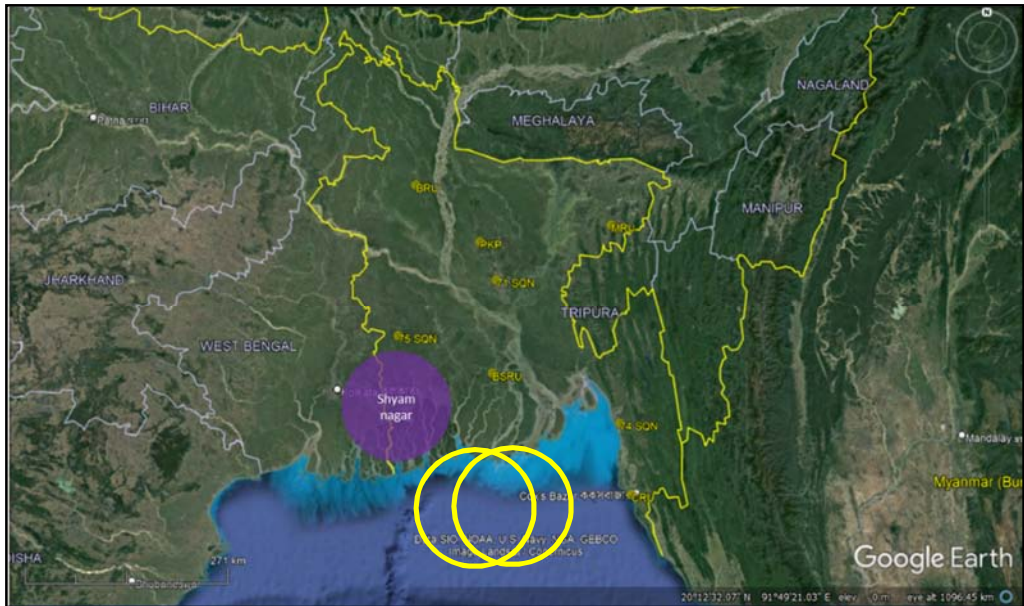
Existing Coverage

For Bangladesh, the National Air Defence refers to territorial air defence over sovereign airspace and ADIZ.²⁴ The sovereignty extends to the airspace over the territorial sea as well as to its bed and subsoil.²⁵ The territorial sea extends up to 12 nm measured from the baseline.²⁶

Bangladesh Air Force radars can provide sufficient high-level coverage for airspace surveillance. However, the Bangladesh Air Force has acquired GFRs to boost its LL surveillance capabilities. During an interview with the Air Defence Director, it was found that in the southwestern region, the GFR is only accessible as far as

Shyamnagar and Shatkhira due to a lack of road connectivity. Consequently, the surveillance coverage does not reach the optimal level given the radar's capacity. The circle shown in yellow indicates the extent of low-level surveillance coverage if riverine air defence radar is used.

Figure-8: Extended LL Coverage in SW of Bangladesh



Source: <https://www.google.com/search?client=firefox-b-d>

The director of the Air Defence Directorate also acknowledged that the current GFRs are insufficient to offer low-level coverage if the Air Force has to enhance airspace surveillance coverage towards the south, particularly over the coastal islands. These islands, along with St. Martin, are inaccessible by road, which hinders the deployment of GFRs there. Since the nature of any country's Air Defence coverage portrayal is confidential, the country's total coverage and initially planned sites cannot be shared.²⁷

Riverine AD Radar is Capable to Complement National Air Defence

Complementing refers to a feature or capability that will augment existing capability. For this research, complement means any possible extension of existing radar coverage, increased time of availability, increased mobility and increased survivability under hostile conditions. This is briefly discussed below:

Extension of Existing Radar Coverage: A riverine AD radar put in the rivers along the south coast of Bangladesh, or a maritime radar deployed on the coastal islands will

expand radar surveillance towards the sea till the end of Bangladesh's maritime boundary.²⁸

Increased Time of Availability: During repositioning and redeployment, land-based radars cannot remain operational. In contrast, riverine air defence radars may be kept on constant observation, except during cooling time.

Increased Mobility: The riverine air defence radar's mobility would save deployment time.

Increased Survivability: Under specific threat scenarios, riverine air defence radars would be more resilient than GFRs. Consequently, the Air Defence Ground Environment is likely to stay redundant.²⁹

Riverine Air Defence Radar in Light of Core Capabilities of Air Defence System: Riverine air defence radars are expected to operate in numerous frequency bands, similar to conventional radars. The Air Force can now communicate with its national satellite. Thus, a sophisticated command and control network may incorporate riverine air defence radars into the overall air defence system.³⁰ Moreover, using the Bangabandhu Satellite, Bangladesh's Integrated Air Defence System can combine riverine air defence radars. Any new radar-specific technology can be integrated in the future. The riverine ship might serve the Bangladesh Air Force for at least 30 years if properly maintained.

The riverine vessel may incorporate systems for data processing as well as the addition of new equipment. The researcher questioned the Deputy Director of Communication and Engineering about the practical plausibility of installing a ground station for the Unmanned Aerial Vehicle (UAV) onboard the ship in terms of communication. In response, the Deputy Director said that technical concerns with operating the UAV may not be an issue if the base station is located on a riverine ship. However, a detailed technical assessment may be done before taking such an initiative. A riverine air defence radar ship will be able to accommodate similar types of communication facilities as a naval frigate including satellite communication. A riverine air defence radar would be able to maintain a high degree of readiness which is elaborately discussed in previous chapters.

Conclusion and Recommendations

Ground-based air defence radars face barriers regarding mobility, vulnerability, security, logistics, personnel management, etc. These limitations might ultimately hinder the GFR's ability to offer optimal airspace surveillance coverage. A riverine air defence radar could alleviate several of these problems and improve airspace

surveillance coverage. It might be claimed that establishing aerial surveillance using only riverine air defence radars to fill low-level gaps is not a flexible choice. In its place, a combination of land-based GFR and riverine air defence radar might provide a resilient and versatile integrated air defence system.

Due to the novelty of the concept, an experiment to discover a comparable outcome would confirm the concept and offer commanders with alternatives for future force planning in terms of GFRs. Using the current KRONOS LAND GFR of the Air Force, the experiment could be conducted easily. Numerous ferries facilitate the transportation of automobiles across rivers. Bangladesh Air Force may collaborate with the Department of Roads and Highways to transfer the GFR from Dhaka to Jashore via the "Paturia Ferry Ghat." When the ferry would cross the river, the GFR could be activated and operational viability could be assessed. This experiment can be conducted at any time with careful planning.

Bangladesh's ship-building capabilities give the chance to build and maintain ships with low life-cycle costs. The navigability of the rivers allows access to the majority of the mainland for air defence surveillance coverage. Thus, it is arguable that "the Riverine Air Defence Radar can be a viable option to complement National Air Defence."

Based on the finding of this research, the following policies are recommended:

First, a Board of Officers may be constituted at Air Headquarters to investigate the viability of operating a radar in riverine conditions by deploying the existing KRONOS LAND GFR on a ferry. Second, once satisfied with the results of the trial, a research and development programme may be initiated to evaluate the indigenous ship's technical suitability for mounting an air defence surveillance radar. Bangladesh Navy has extensive experience in the relevant field. Consequently, experience from the Bangladesh Navy may also be included. Third, Bangladesh Air Force may collaborate with the Directorate General of Shipping, Bangladesh Shipping Corporation, Bangladesh Inland Water Transportation Authority, Roads and Highways Department, Bangladesh University of Engineering & Technology (BUET) and other private stakeholders to look into the option of acquiring a riverine air defence radar system. Fourth, Bangladesh Air Force may construct one or two riverine air defence radar systems if technical and economic feasibility is met. These platforms would be utilised in conjunction with ground-based GFRs. Finally, Bangladesh Air Force may exploit other opportunities to exploit rivers for operational usage for instance as the GBAD platform and riverine SOC in future.

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Brief Biography



Wing Commander MD Zahid Ashraf, psc, GD(P) was commissioned in GD(P) Branch on 23 November 2000 from Bangladesh Air Force Academy with 42 GD(P) course. He is a graduate of DSCSC, Mirpur. He completed B.Sc (Aero) from the National University of Bangladesh. He attended various professional courses at home and abroad. He held various appointments during his career in BAF mentionable Adjutant of No 3 Squadron, Unit Pilot & Security Officer of the 101 Special Flying Unit, Assistant Director of the Directorate of Air Operation and Deputy Director of the Directorate of Welfare and Ceremony at Air Headquarters. Besides BAF, he also served as Deputy Director of the Rapid Action Battalion and Instructor at the Corps of Military Police School, Ghatail; and also had the opportunity to serve in United Nations Peacekeeping Mission in Ivory Coast as Military Police, and in DR Congo as Pilot-in-Command with Bangladesh Aviation Transport Unit as well as Pilot-in-Command with Bangladesh Aviation Transport Unit-11 at DR Congo. Presently, he is serving in Flight Safety Institute, BAF Base Basher.

Feasibility of Trench Warfare in the Present-Day Context of Urbanisation: An Infantry Battalion Perspective

Major Md Fahim Sarwar, psc, Infantry

Abstract

Due to rapid urbanisation, it is pretty challenging to site trenches on the ground. There is a need for integration of Built-Up-Area (BUA) defence and trench-based conventional defence techniques based on the terrain configuration. The Standard Infantry Battalions (SIB) are not adequately organised and equipped to adopt an integrated defence technique. Besides, the lack of specific doctrinal guidance, training and experience of junior leaders hinders the effectiveness of SIBs in defensive operations. The SIBs must be well organised, equipped and prepared to fight a defensive battle by adopting an integrated defence technique in a blended environment. Besides, appropriate doctrinal guidance and training facilities will enable the SIBs to fight more effectively. A mixed method of qualitative and quantitative analysis has been conducted, which includes surveys, interviews, focus group discussions and content analysis. Through this study, challenges for trench-based area defence posed by rapid urbanisation have been identified. It has also investigated the most effective option for SIBs to defend their area of operation (AOP) and the limitations of SIBs in adopting an integrated defence technique. The researcher has proved the hypothesis: “Integration of BUA and trench-based conventional defence techniques will enhance the effectiveness of a SIB in the present-day context of urbanisation.” Finally, this research proposed the required modifications for SIBs to defend in a blended environment effectively.

Introduction

Bangladesh (BD) is known as ‘Defenders Paradise’ due to its varied terrain condition, numerous water bodies and low-lying lands. The physical and climatic characteristics of the terrain significantly affect the deployment of forces. BD’s geographical position and shape do not offer sufficient operational depth. The terrain features facilitated by several rivers, large open spaces and vegetated villages at intervals offer layers of good defendable terrain. Therefore, retaining control of terrain has got due significance in our doctrinal concept.

Historically known as a rural-agrarian country, BD is experiencing rapid transformation into an urban society today.¹ In the last decade, urban growth was significant and reached 38.18% in 2020. Rapid urbanisation is characterised by the

widespread formation of small to large BUAs and has added a new dimension to terrain peculiarity. The density, construction and complexity of man-made features or BUAs in urban areas allow forces to rapidly use or shape the environment to strengthen a defence plan further. Nevertheless, it also demands military forces' better preparation and adaptive capability.²

The force generation of the Bangladesh Army (BA) conforms to the doctrinal concept of retaining control of terrain. Infantry divisions are the backbones of the Army, which are primarily organised, equipped, and trained to fight defensive battles to defend the respective area of responsibility (AOR). The compartmentalised terrain of BD significantly works as a force multiplier in the deployment of the infantry divisions in different areas of the country. Area and natural obstacle-based positional defence assist the deployment of the infantry divisions in respective sectors conforming to the doctrinal concept. Despite rapid urbanisation, a significant part of BD offers excellent defence potential, reiterating the necessity of fighting from trenches. Furthermore, rapid urbanisation strengthens the necessity of positional defence, posing a need for an appropriate force. Thus, there is a need to modify the force structure and adopt a balanced approach to negate the challenges of fighting in a defendable terrain with numerous BUAs which may be termed a blended environment.

SIBs are the basic manoeuvre units of an infantry division. Infantry battalions mainly operate in the framework of a brigade when deployed on the ground. Generally, in a formation AOR, SIBs are to fight almost independently, devoid of desired mutual support. Moreover, the varied terrain condition and urbanisation also hinder the deployment of SIBs following the conventional defensive layout. In most cases, it is challenging to site weapon trenches in some terrain due to urbanisation. Various researchers have suggested integrating BUA and trench-based conventional defence techniques. In this connection, the SIBs need to adopt a blended strategy of fighting defensive battles corresponding to the changes in terrain features. Hence, it is imperative to examine the feasibility of trench-based conventional defence in the context of urbanisation from the perspective of SIBs to suggest adoption measures for SIBs of BA.

Against this backdrop, initially, the challenges of SIBs in taking trench-based conventional defence in the context of urbanisation have been highlighted in this writing. Thereafter, the most effective option for integrating BUA with conventional defence techniques and the corresponding limitations of SIBs have been discussed. Finally, a few required modifications for SIBs to fight the defensive battle in a blended environment and an appropriate adoption strategy have been suggested followed by a few recommendations.

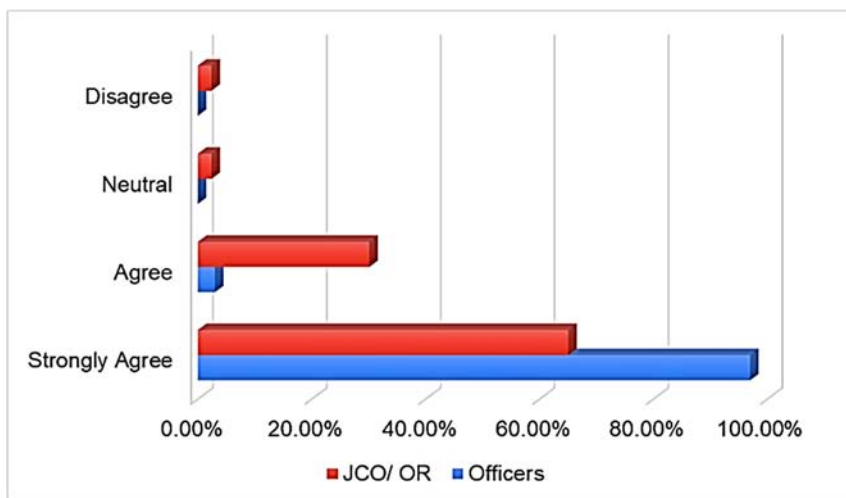
Growing Challenges for Trench-Based Area Defence due to Rapid Urbanisation

The changed terrain configuration poses significant challenges for infantry battalions to defend their respective AOP following the conventional trench-based defence technique. As such, it is necessary to evaluate the growing challenges of urbanisation on our conventional area defence techniques.

Challenges for Trench-based Area Defence due to Urbanisation

First, urbanisation hinders command and control aspects in defensive operations.³ BUAs make it difficult for commanders to have an overall estimation of the battle's progress.⁴ The presence of BUAs restricts the line of sight (LOS) hindering visual and radio communication. BUAs pose challenges to the smooth administration and logistics function of the battalion.⁵

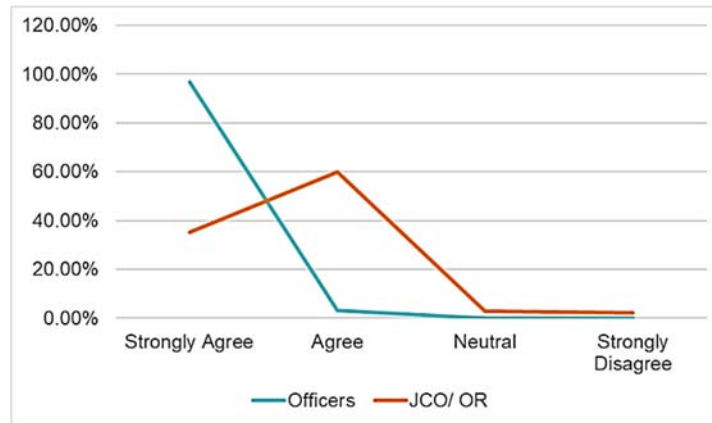
Figure-1: Responses Confirming Difficulty in Command and Control due to Urbanisation



Source: Author's self-construct

Second, the open and flat nature of the terrain of BD is gradually diminishing due to urbanisation. It is often difficult to find suitable ground for deploying all battalion elements in area defence as per the doctrinal guidance.⁶ Respondents of a survey opined the same.

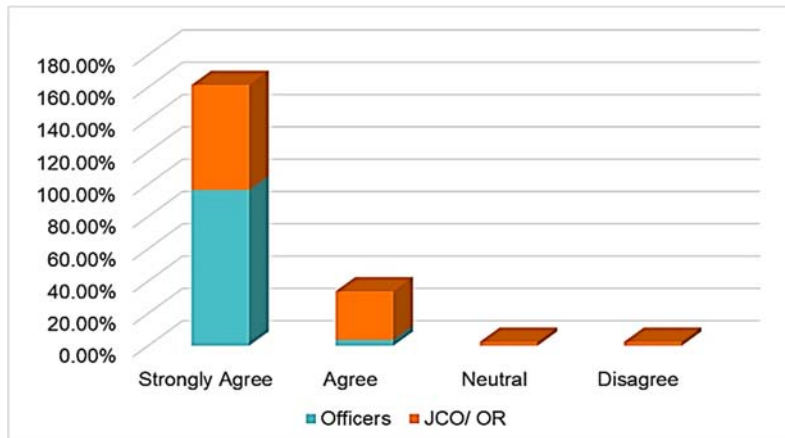
Figure-2: Responses Confirming Non-availability of Suitable Ground for Deploying all Elements of a Battalion in Area Defence



Source: Author's self-construct

Third, an effective and proper siting of weapon trenches is essential in an area defence. Due to urbanisation, it is now quite challenging to effectively site an infantry battalion's weapon trenches.⁷ Thus, it implies a growing challenge to the trench-based area defence technique.

Figure-3: Responses Confirming Difficulty in Siting Weapon Trenches of a Battalion in Area Defence

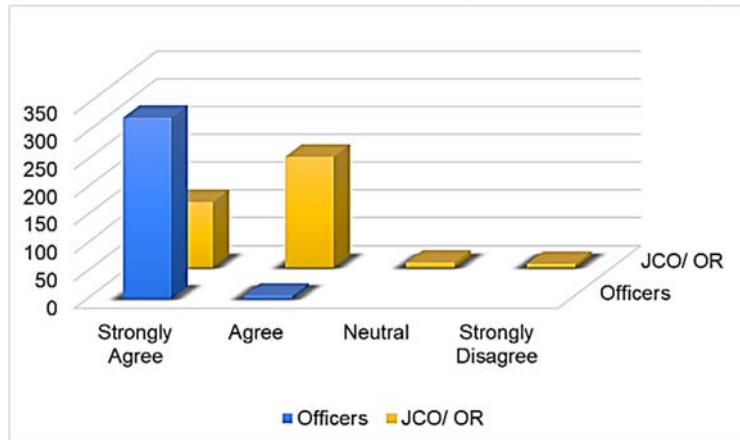


Source: Author's self-construct

Fourth, a clear field of fire is essential for delineating the killing ground of the sub-units and the battalion as a whole.⁸ Due to urbanisation, it is pretty challenging to get a clear field of fire for all the weapons of an infantry battalion, including the support weapons.

Fifth, urbanisation results in the reduced natural cover of the village lines and river lines. The lack of cover and concealment also affects the force protection measures and makes the battalion defence susceptible to easy detection by enemy surveillance systems and aerial reconnaissance.⁹

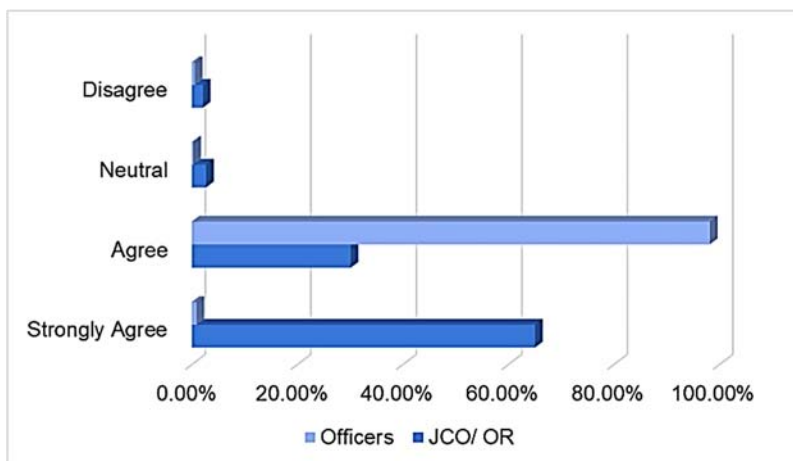
Figure-4: Responses Confirming Lack of Field of Fire due to Urbanisation



Source: Author's self-construct

Sixth, the absence of a clear field of fire due to isolated structures in front of the FDL makes it difficult for an infantry battalion to achieve mutual support in a blended environment. An extended frontage due to terrain peculiarity also hinders achieving mutual support within an area of defence.

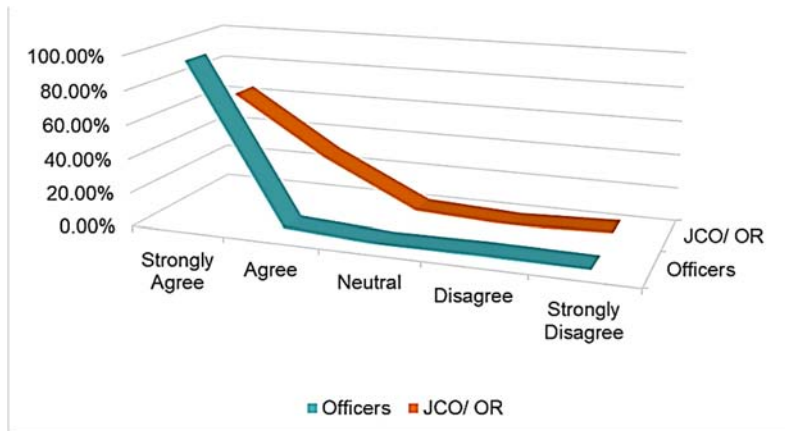
Figure-5: Responses Confirming Inadequate Cover and Concealment due to Urbanisation



Source: Author's self-construct

Seventh, the challenge remains with siting the depth elements of a battalion, i.e. depth section/platoon/company in area defence.¹⁰ The depth elements in an area defence often become redundant. It poses a significant challenge for an infantry battalion as it degrades the effectiveness of the defence.

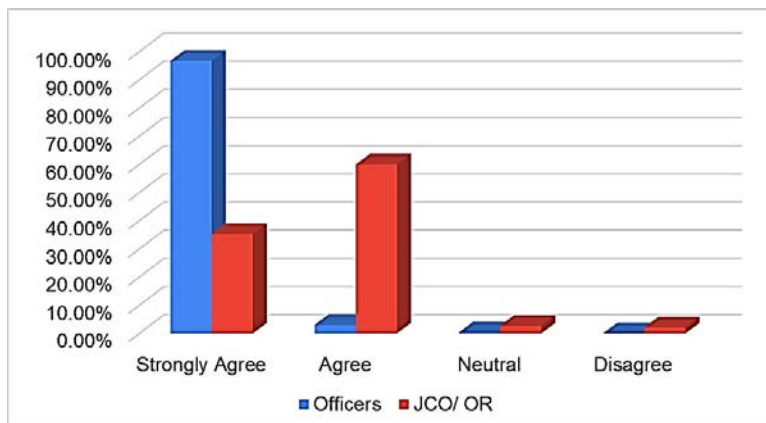
Figure-6: Responses Confirming Difficulty in Ideal Siting of Depth Elements of an Infantry Battalion in Area Defence



Source: Author's self-construct

Eighth, BUA makes the reserve movement difficult and time-consuming, affects the proper deployment during counter penetration and hinders the field of fire. Thus, hindrance in the effective manoeuvre of reserve significantly affects the defenders' aggressive action and endangers the defence.

Figure-7: Responses Confirming Difficulty in Manoeuvre of Reserve Due to Urbanisation

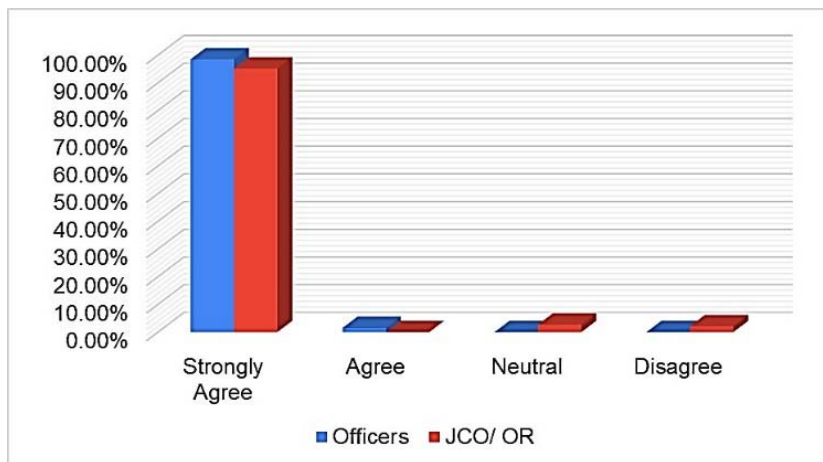


Source: Author's self-construct

The Most Effective Option for Area Defence and Corresponding Limitations of SIBs

Rapid urban growth demands an immediate focus on integrating defence techniques. The survey responses also confirm that there are certain limitations of SIBs for adopting integrated defence techniques. In the subsequent paragraphs, an effort has been made to unveil the most effective option for SIBs to defend their AOP in the present-day context. Then, the corresponding limitations of SIBs in adopting an integrated technique have been highlighted to comprehend the importance of the required modification.

Figure-8: Responses Confirming Integration of BUA and Trench-based Defence Techniques as the Most Effective Option for SIBs



Source: Author's self-construct

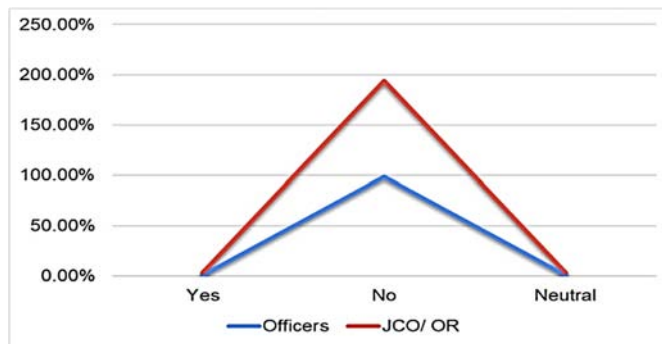
Most Effective Option for SIBs to Defend Own AOP in the Present-day Context of Urbanisation

In today's context, the trench-based area defence technique cannot alone effectively serve the purpose of the defenders. The terrain feature of BD restricts the cross-country mobility of mechanised forces. Thus, the positional defence has assumed an essential role in our defensive doctrine.¹¹ Most of the roads in our country have passed through small to large BUAs. The defenders need to identify the most likely approaches to defend those. In doing so, the defenders should combine BUA defence and trench-based defence, taking advantage of existing natural obstacles and urban areas. The BUAs enhance the defence potential of an area defence. Thus, it is evident that integrating BUA and conventional trench-based defence technique is the most effective option for SIBs in the present-day context.

Limitations of SIBs in Adopting an Integrated Defence Technique

The organisational and equipment capability of SIBs is a prerequisite for the integration of defence techniques. Most survey respondents opine that SIBs are not equipped/organised for adopting such integrated techniques in a blended terrain. Besides, the defence technique practised at the battalion level in different exercises is incompatible with the present-day requirement of integrating BUA and conventional defence techniques.¹²

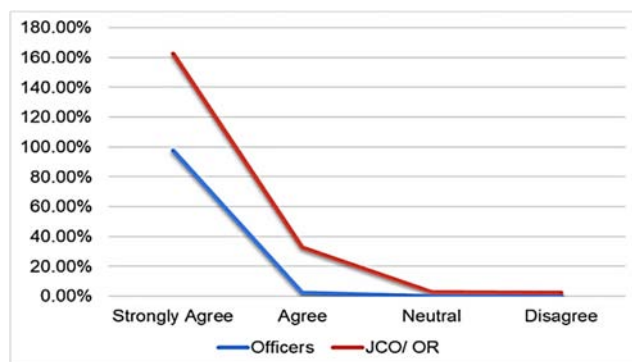
Figure-9: Responses Confirming the Limitations of SIBs in Terms of Organisation and Equipment



Source: Author's self-construct

Lack of Training at Formation Level: While the present-day requirement advocates adopting an integrated defence technique, the focus is still on the conventional trench-based area defence. A survey result shows that, at the formation level, about 96% of the respondents did not get the opportunity to practice the integration of BUA and trench-based conventional defence technique in any Winter Training/Unit Training/Group Training/Cycle Ending Exercise/MD/TEWT, etcetera in the last five years.

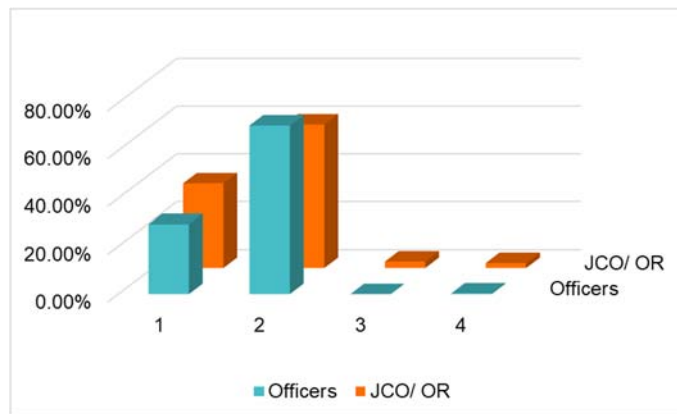
Figure-10: Responses Confirming Lack of Training at Formation Level on Integration of Defence Techniques



Source: Author's self-construct

Lack of Training at the Institutional Level: Institutional training rarely emphasises integrating the BUA and conventional defence techniques. The integration of defence techniques is not adequately focused on in any courses, particularly, the Basic Course and Junior Command and Staff Course (JC&SC).

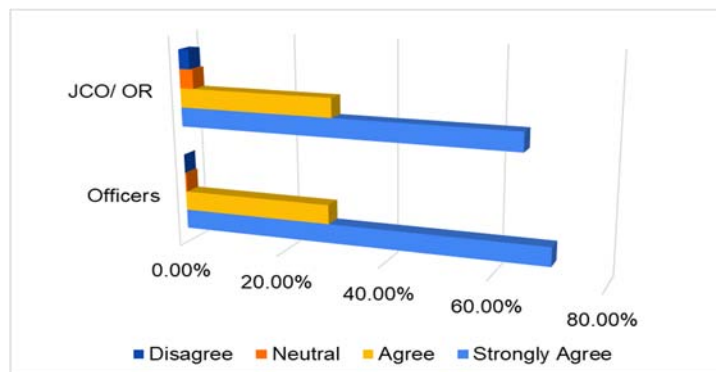
Figure-11: Responses Confirming Lack of Institutional Training on Integration of Defence Techniques



Source: Author's self-construct

Lack of Experience of Junior Leaders: Lack of training on the integration of defence techniques results in the inexperience of the junior leaders. At the formation level, it is not easy to exercise the integration of BUA and trench-based defence in peacetime as it involves the occupation of civilian buildings and structures.¹³ It is evident that the junior leaders lack experience in integrating defence techniques.

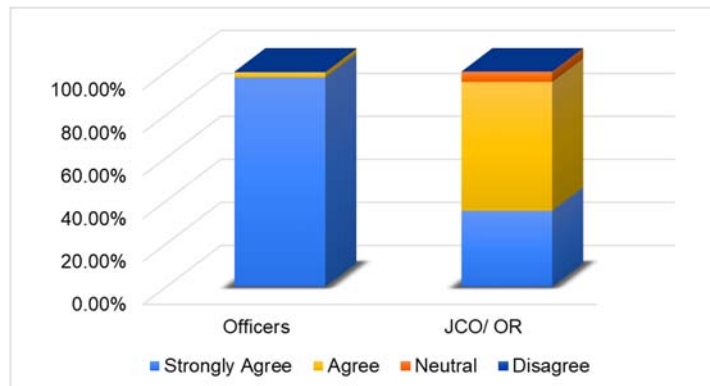
Figure-12: Responses Confirming in Experience of Junior Leaders on Integration of Defence Techniques



Source: Author's self-construct

Lack of Specialised Weapons and Equipment: The SIBs are not equipped to adopt an integrated defence technique. It is obvious that the SIBs need to be better equipped for integrating BUA and trench-based defence techniques, as BUA defence demands special equipment and weapons.¹⁴

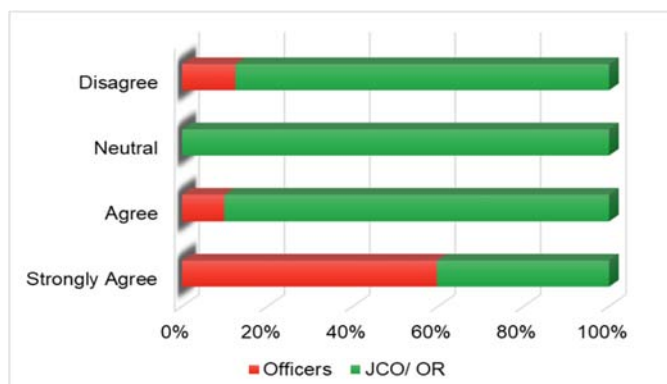
Figure-13: Responses Confirming in Lack of Specialised Weapons and Equipment of SIBs for Integration of Defence Techniques



Source: Author's self-construct

Organisational Deficiency/Shortcomings: The organisation of SIBs holds good for trench-based area defence. They are not well organised for adopting an integrated defence technique.¹⁵

Figure-14: Responses Confirming Organisational Shortcomings of SIBs for Integration of Defence Techniques

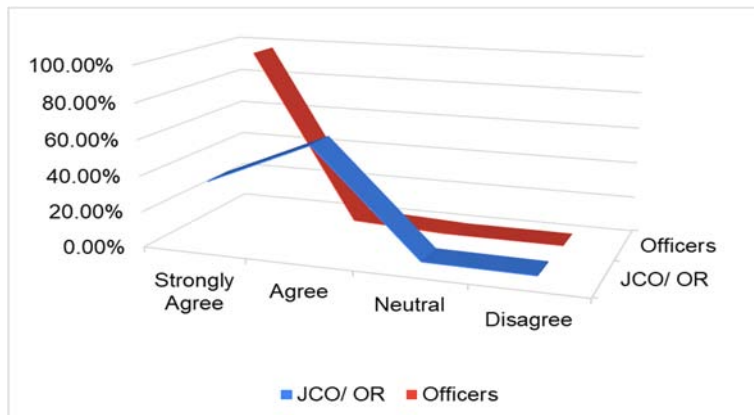


Source: Author's self-construct

Absence of Specified Tactics, Technique and Procedure (TTP): There is no clearly laid down battle drill and procedure for integrated defence techniques. The SIBs lack clear guidance on such integration from the doctrinal point of view.¹⁶ The survey

respondents agree that there is an absence of TTP for SIBs to integrate defence techniques.

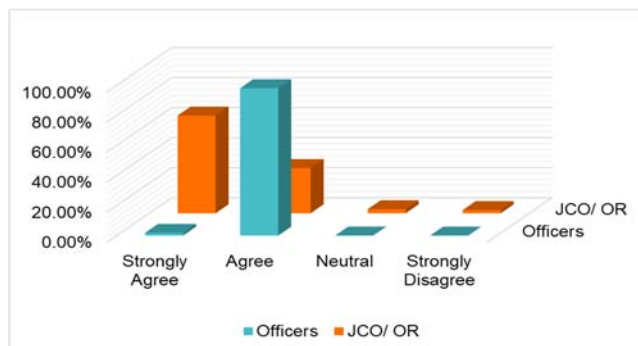
Figure-15: Responses Confirming Absence of Specific TTP for SIBs for Integration of Defence Techniques



Source: Author's self-construct

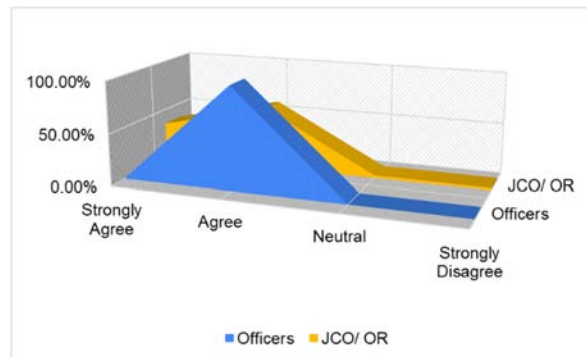
Limited Surveillance and Air Defence (AD) Capability: The SIBs lack surveillance capability for operating in a blended environment. Besides, the static nature of area defence makes it susceptible to enemy air action. The SIBs do not have functional AD capability to counter such threats.

Figure-16: Responses Confirming Limited Surveillance and AD Capability of SIBs



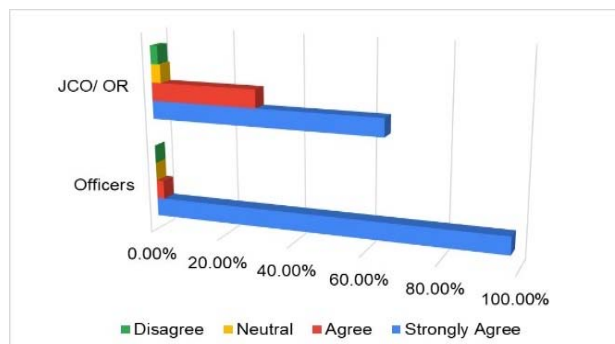
Source: Author's self-construct

Limited Mobility: The enemy will always try to exploit the gaps in the defence. On the other hand, the enemy will try to bypass BUAs as a close-quarter battle (CQB) is difficult and time-consuming. To counter such enemy actions, mobility is a significant limitation of SIBs.

Figure-17: Responses Confirming Mobility as a Major Limitation of SIBs

Source: Author's self-construct

Limited Field Engineering Capability: The existing field engineering capability of SIBs is insufficient to arrange necessary protection measures. Besides, BUA defence demands the extensive use of explosive devices.¹⁷ The SIBs do not have trained manpower to handle explosives in the present organogram.

Figure-18: Responses Confirming Limited Field Engineering Capability as a Major Limitation of SIBs

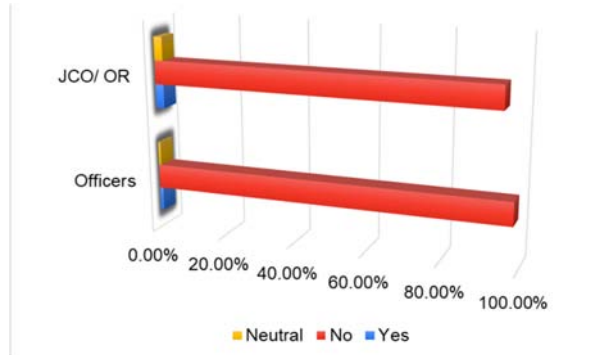
Source: Author's self-construct

Modifications and Adoption Strategy for SIBs to Fight in a Blended Environment

The rapid urban growth in BD significantly affects the conduct of military operations. The changed terrain configuration poses significant challenges for SIBs to follow the conventional trench-based defence technique. An integrated defence technique combining the BUA and trench-based conventional defence technique has been identified as the most effective option for area defence. The SIBs have some limitations in adopting such integrated defence techniques. As such, SIBs must undergo some modifications and adopt measures to overcome the limitations and meet the challenges. The subsequent paragraphs have attempted to identify the plausible

steps that can enable SIBs to have enhanced effectiveness in fighting a defensive battle in a blended environment in the present-day context.

Figure-19: Responses Confirming the Limitations of SIBs in Terms of Organisation and Equipment

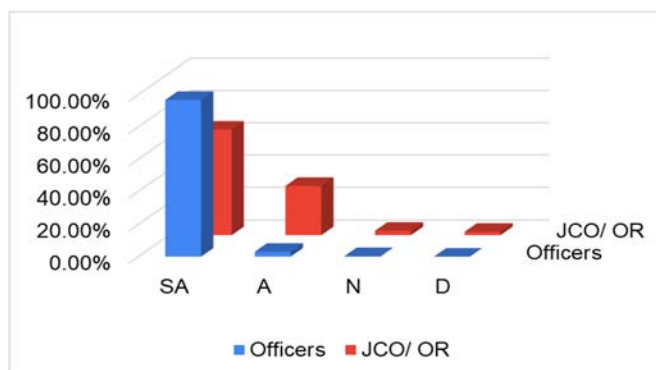


Source: Author's self-construct

Leadership Development at Battalion Level: The present-day operational environment is challenging, and junior leaders have a significant role in fighting defensive battles. The integrated defence technique demands leaders to be more adaptive and flexible. Battalion-level leadership development will enable SIBs to adopt an integrated defence technique efficiently.¹⁸

Leadership Development Training: The infantry battalions should play a pivotal role in training the junior leaders on integrated defence techniques. Once the junior leaders are trained, they can impart the same to the under commands. The commanding officers should take adequate measures to train the junior leaders on the integrated defence technique by arranging study periods, MDs and etcetera.

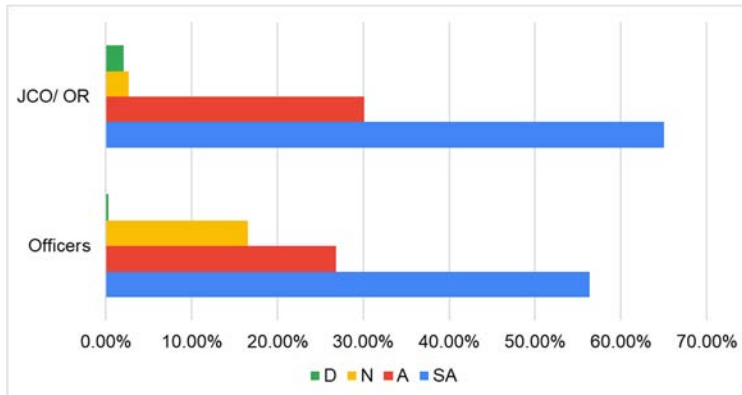
Figure-20: Responses Confirming Leadership Development by Training at Battalion Level



Source: Author's self-construct

Incorporation of Mission Command Philosophy: Commanding officers of the battalion should encourage the junior leaders to take responsibility and perform independent assignments. This will enable them to take decisions without looking up to the commander for disposal. This will also enable them to become innovative and exploit opportunities.

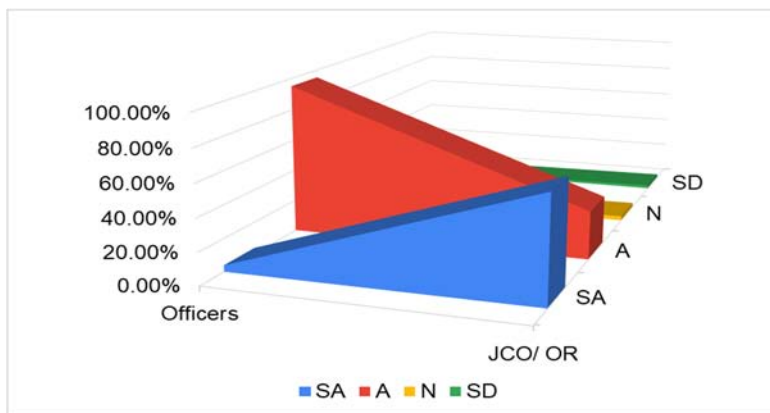
Figure-21: Responses Confirming the Positive Impact of Incorporating Mission Command Philosophy at Unit Level



Source: Author's self-construct

Encouraging Adaptive and Flexible Thinking: Infantry battalions should have a fear-free and encouraging environment. Such a conducive environment in the battalion will help the junior leaders to flourish their leadership skills. It will help the junior leaders handle the changed operational environment scenario.

Figure-22: Responses Confirming the Positive Impact of Encouraging Adaptive and Flexible Thinking

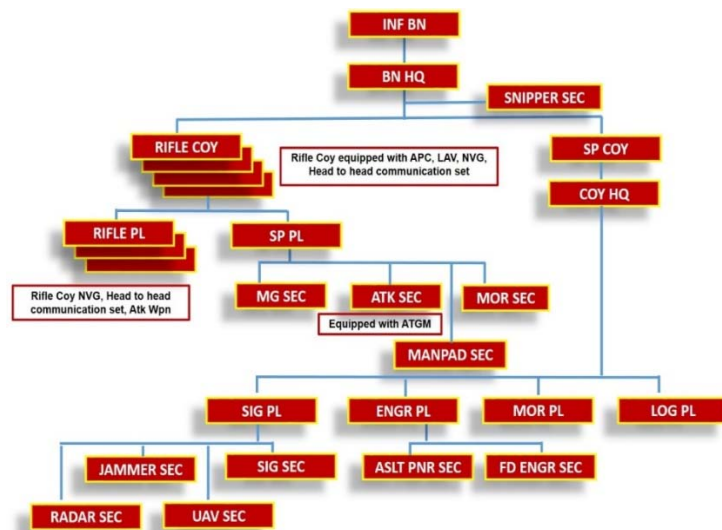


Source: Author's self-construct

Organisational Modification

The existing table of organisation and equipment (TO&E) of SIBs holds good for trench-based area defence.¹⁹ The SIBs need to be better equipped as the integration of defence techniques will demand special capability in terms of equipment and weapons. A comprehensive organisational structure would provide the platform for incorporating modern weapons and equipment in SIBs. Based on the requirement, a proposed organogram for SIBs has been outlined.

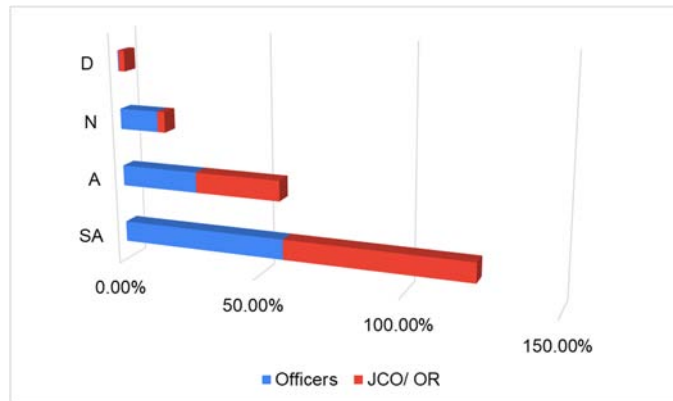
Figure-23: Proposed Organogram for SIBs



Source: Author's self-construct

To counter the varied nature of threats, the SIBs need to be equipped with modern gadgets and weapons. The battalions should develop self-help capabilities to deal with any threat. The blended environment demands the use of short-range anti-tank weapons, and the number of short-range anti-tank weapons in SIBs should be increased. To counter enemy air action, man-portable air defence systems (MANPADS) should be incorporated into the SIBs. Armoured Personnel Carriers (APC) and Light Armoured Vehicles (LAV) should also be incorporated into the SIBs to enhance mobility to counter any bypassing attempts. It will also enable the SIBs to launch counter-attacks quickly within the defensive location. The addition of a field engineer section in the organogram will offer better engineering capability for the SIBs, which can be exploited for preparing strong points, weapon positions and handling explosives. Besides, there should be a provision for additional grenades and explosives. The modern head-to-head communication system and gadgets should be incorporated up to the section level, which will enhance the effectiveness of SIBs.

Figure-24: Responses Confirming Enhanced Effectiveness of SIBs through Modernisation



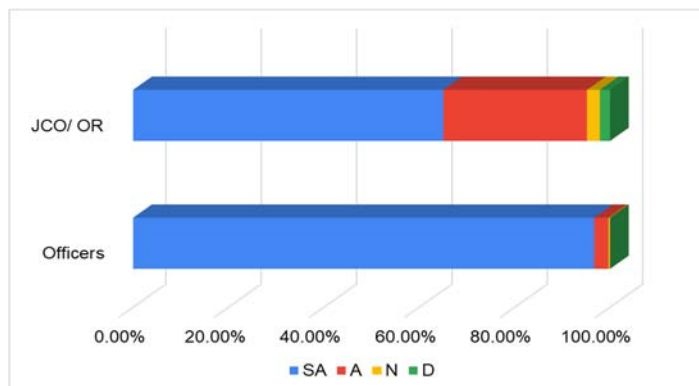
Source: Author's self-construct

Enhanced Training Activities and Facilities

The integrated defence technique necessitates the development of the skills of each member of the SIBs. As such, enhanced training activities need to be undertaken at all levels. The enhanced training program will require adequate infrastructure and facilities at the formation and institutional levels.

The training on integrated defence techniques at the formation level needs to be enhanced for training the junior leaders. The formations should put adequate emphasis on the integrated defence technique and exercise this through different field training exercises, MD and TEWT organised for both officers and JCO/ NCOs.

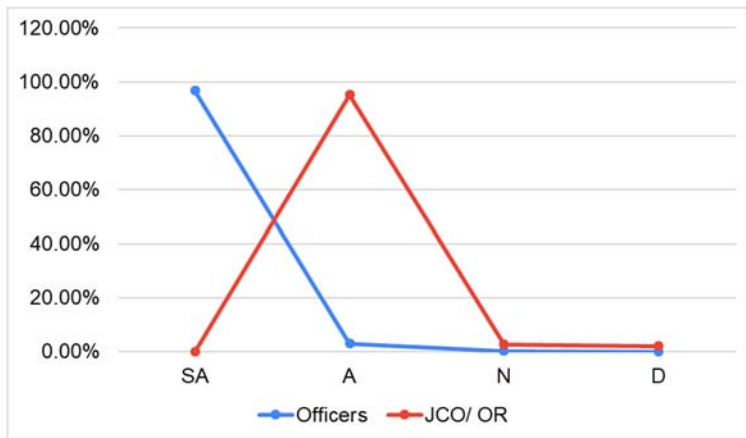
Figure-25: Responses Confirming the Necessity of Enhanced Training at the Formation Level



Source: Author's self-construct

Furthermore, institutional training will play a vital role in training the officers and other ranks on the integrated defence technique. The training on integrated defence techniques should be incorporated into courses like basic course, JC&SC, JCOC, NCOC, etcetera.²⁰

Figure-26: Responses Confirming the Necessity of Enhanced Training at the Institutional Level



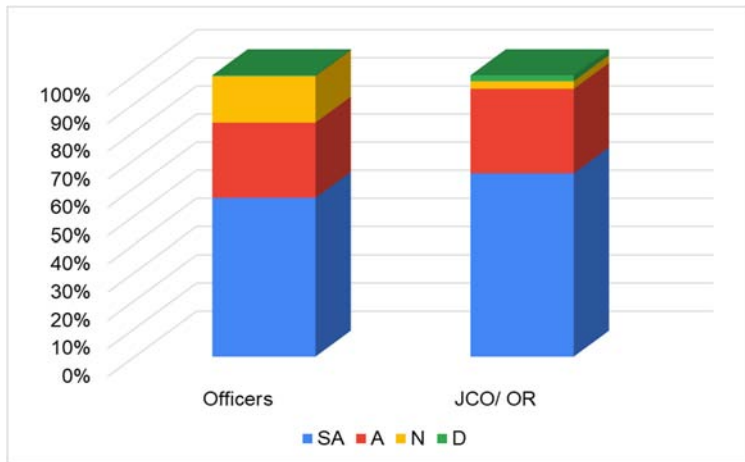
Source: Author's self-construct

Finally, adequate combat training infrastructures containing semi-urban areas and complex terrain features should be developed at different formations to train sub-units. Besides, training institutions should also develop such infrastructures to impart training to the officers and men in different army-level courses.

Specific TTP for the Integrated Defence Technique

The SIBs lack clear guidance on the integrated defence technique from the doctrinal point of view. Besides, there should be clearly laid down battle drills and procedures for SIBs for such integration. The SIBs will be able to execute the integrated defence technique effectively having specified TTP and clearly laid down battle drills and procedures. Accordingly, the tactical doctrine (Operation of War) should include the salient aspects of the integrated defence technique. Subsequently, the pamphlets applicable at the battalion level (IBIB and ICIB) need to incorporate the important aspects of integrated defence techniques. Once the TTP is developed, it will aid in delineating and developing the battle drills and procedures applicable to the integrated defence technique.

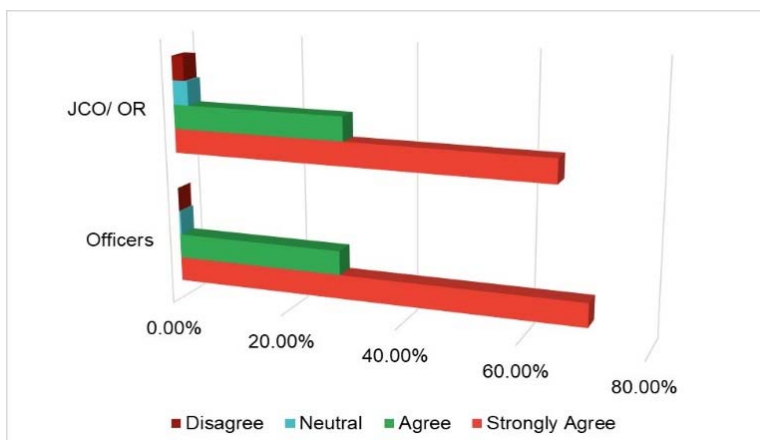
Figure-27: Responses Confirming Requirement of Doctrinal Guidance for Formulating Specific TTP for Integrated Defence



Source: Author's self-construct

A few important aspects should be considered while formulating the specific TTP for integrated defence techniques. Due importance must be given to the flexibility of the command. Besides, the possibilities of having strong points, weapon positions sited in buildings within the defended locality and having prepared pillboxes/concrete emplacements in the most likely enemy avenues of approach (AA) need to be considered.²¹ The blended environment will also impact the deployment, layout, frontage and depth of SIBs in positional defence. As such, a flexible TTP will allow SIBs to conform to the ground reality and defend the AOP effectively.

Figure-28: Responses Confirming the Positive Impact of a Flexible TTP



Source: Author's self-construct

Conclusion and Recommendations

The very nature of BD's terrain favours the defenders. Due to rapid urban growth, the open and flat nature of the terrain is gradually diminishing over all parts of BD. It is not easy nowadays to conduct defensive operations following the conventional trench-based defence technique. The SIBs, being the basic manoeuvre units of infantry divisions, face the challenges of urban growth while defending their respective AOP. The SIBs need to adopt a blended strategy and undergo organisational modifications to operate effectively in such a blended environment.

Firstly, the changed terrain configuration poses significant challenges for SIBs to defend their respective AOP following the conventional trench-based technique. The restricted LOS due to urbanisation hinders visual and radio communication, creating difficulty in command and control. The gradually diminishing open and flat nature of the terrain further complicates the ideal deployment of SIBs. The rapid urban sprawl often forces SIBs to adopt an extended frontage and depth. Rapid urbanisation has made it more challenging to site the weapon trenches of SIBs. A lack of a clear field of fire for all the weapons of infantry battalions further complicates the issue and reduces the effectiveness of a SIB in a positional defence. Urbanisation results in a reduced natural cover of the village and river lines. Thereby, the natural camouflage and concealment in area defence are compromised. The absence of suitable weapon siting positions hinders SIBs from achieving mutual support in area defence. Besides, urbanisation does not allow an ideal siting of depth elements of a battalion due to the proximity of villages and lack of a clear field of fire behind the forward elements. The reserve operation in a blended environment becomes more challenging as the urban structures hinder movement and quick deployment. Apart from these, the challenges concerning logistics, air support and fire support in an urban environment are also very prominent.

In the present-day context, integration of BUA and trench-based positional defence is the most effective option for SIBs for area defence. However, it has also been identified that the SIBs have certain limitations regarding organisation, training and equipment. The lack of training on integrated defence techniques at the formation level indicates that the focus on integrated defence techniques is not enough. On the other hand, institutional training does not emphasise the integrated defence technique, which also acts as a barrier. This, in turn, results in the inexperience of the junior leaders, as they are not exposed to such practices. The organisational shortcomings serve as another hurdle for the SIBs. The existing organogram holds good for the trench-based positional defence. The absence of specialised weapons and equipment makes the issue further challenging for the SIBs. The absence of a specific TTP for integrated defence technique, limited surveillance and AD capability, limited mobility and limited field engineering capability are the other

significant challenges for SIBs in adopting an integrated defence technique. The difficulties concerning fire support, command control arrangements and logistics make it challenging for SIBs to operate in a blended environment.

Leadership development at the battalion level can significantly contribute to executing an integrated defence on the ground. Junior leaders must be encouraged to take decisions by exercising the mission command philosophy. The commanding officers should encourage adaptive and flexible thinking by the junior leaders to get the optimum effect. Incorporating modern equipment and weapons like short-range anti-tank weapons, MANPADS, NVG, GPS, surveillance radar, and drones will significantly enhance the combat effectiveness of SIBs. Besides, the addition of a field engineer section in the organogram will significantly enhance the engineering capability of the SIBs. Enhanced training both at the formation and institutional level will also result in enhanced effectiveness of SIBs. However, adequate training infrastructure will also aid in better training at the formation and training institutions. Doctrinal guidance through ADPs will play a pivotal role in formulating the TTP for integrated defence. The TTP need to be flexible enough to encourage the commanders to plan and execute the plan based on the ground peculiarity. Considerations regarding the irregular deployment pattern, extended/ reduced frontage, incorporation of strong points within the defensive location, etcetera should be kept in my mind while formulating the tactics of integrated defence technique.

Based on the findings of the research, the following recommendations are made to enhance the effectiveness of SIBs in the present-day context:

First, Army Training and Doctrine Command (ARTDOC) may evaluate and update the present doctrine of defensive operation and include necessary segments for the integrated defence technique. Second, ARTDOC may introduce a new doctrine on Integrated Defence Techniques and formulate appropriate tactics applicable at the tactical level. Third, Integrated Defence Technique should be introduced in the institutional and formation-level training curriculum. ARTDOC should formulate a detailed syllabus for the different courses run in the training institutions. Fourth, Army Headquarters (AHQ) Staff Duties Directorate, in collaboration with the Infantry Directorate, may revisit the existing TO&E of the SIBs and make necessary modifications to make it more effective and adaptive. Finally, AHQ Infantry Directorate must ensure the provision of modern weapons and equipment like jammers, BFSRs, UAVs, MANPADS, NVGs, APCs, LAVs, short-range anti-tank weapons, head-to-head communication systems, etcetera to turn the infantry battalions to a modern outfit.

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7. Personal Interview with Lieutenant Colonel Mosaddeque Rashid, psc, Infantry, Squadron Commander, Army Aviation Group (Ex Commanding Officer, 40 East Bengal) taken on 17 July 2022.
8. Personal Interview with Lieutenant General Waker-Uz-Zaman, SGP, psc, Principal Staff Officer, Armed Forces Division took on 20 July 2022.
9. Personal Interview with Brigadier General Shafique Shamim, psc (Retired) MD and CEO, Sena Kalyan Insurance Company Limited (Ex Brigade Commander, 81 Infantry Brigade) taken on 18 July 2022.
10. Personal Interview with Brigadier General Khandaker Md Shahidul Emran, ndc, afwc, psc, MPhil, Director, Infantry Directorate took on 19 July 2022.
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Brief Biography



Major Md Fahim Sarwar, psc, Infantry was commissioned from Bangladesh Military Academy (BMA) on 22 December 2010 with 63 BMA Long Course in the Bangladesh Infantry Regiment. He is a graduate of DSCSC, Mirpur. He served in the 14 Bangladesh Infantry Regiment in different regimental appointments. He joined the Army Aviation Group as a trainee pilot in November 2014 and successfully graduated as a pilot in April 2016. He served as the General Staff Officer of Grade II (Operations and Training) and Flight Safety Officer in the Army Aviation Group. He also served in Chattogram Hill Tracts under Operation UTTARON in 2011. He participated in the United Nations Peacekeeping Mission in the Central African Republic. Apart from the mandatory courses, he attended Aviation Basic Course, Rotary Wing Qualification Course, Flight Safety Officers' Course and Type Conversion Course on Mi-171Sh. Presently, he is serving as the Pilot of Army Aviation Group.