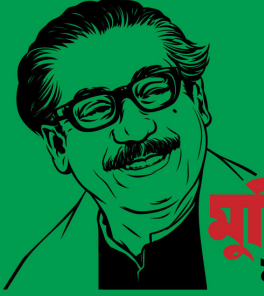


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“Read! In the name of your Lord Who has created (all that exists)”

Surat Al - 'Alaq (The Clot) XCVI



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FOREWORD

National Defence College has been striving since 1999 with a vision to be the premier national centre of excellence on leadership, defence, security, strategy and development studies - meeting the challenges of the 21st century. Since its inception, the college has been relentlessly presenting time - befitting academic curricula to the potential policy planners, senior leaders and strategic thinkers of the future. The college aims to create a balanced outlook and bring a visualization amongst the Course Members with a strategic and operational level understanding. The chronicles of past 22 years testify the viability of the academic system that has contributed to this leading institution in gaining reputation of excellence at home and abroad.

National Defence College being the highest level national institution in Bangladesh, has always been emphasizing on conducting research on contemporary issues of national importance. The common aim of research work is to enable Course Members to make original contribution to a subject of national or international interest, which has influence on national security and development. NDC journal reflects the notable research works carried out by Course Members and Faculty of the college. I am assertive that the Research Papers included in this journal encompassing varied subjects would be considerably useful for the readers.

I congratulate all authors who contributed to this journal. I appreciate the sincere efforts of Research and Academic Wing and acknowledge the hard work of editorial board to publish this journal in due time.



Md Akbar Hossain, SBP, SUP (BAR), afwc, psc, G+, PhD
Lieutenant General
Commandant

EDITORIAL

National Defence College, Bangladesh is the premier national center of excellence on leadership, Security, Strategy and Development Studies. The College believes that a senior officer from military and civil services should have a good understanding of the major economic, political and social issues of the nation and be able to recommend measures to face the challenges. Hence NDC regularly conducts various research works on contemporary issues of national as well as international importance.

NDC Journal is a bi-annual publication of National Defence College publishing selected research papers prepared by the course members. The articles for the journal (Volume 20, Number 2, December 2021) are mostly selected from individual research papers that the Course Members had submitted as part of the course curriculums. National Defence College has been very regular in bringing out 'NDC Journal' every year on time. This speaks of the laborious effort and genuine commitment on the part of both the editorial staffs and the writers.

A total of 13 (thirteen) Research Papers have been adjudged for publication in the current issue in abridged form. The articles reflect complex and intricate multidimensional issues emanating from the long diversified experience of the course members and the curriculum based deliberations and discourse on various topics concerning comprehensive national security during the trainings. This volume includes papers of different categories that will be able to draw the attention of varied groups of reader.

We would like to express our sincere gratitude to the Chief Patron Lieutenant General Md Akbar Hossain, SBP, SUP (BAR), afwc, psc, G+, PhD, the Commandant of NDC for his valuable guidance. Research is a highly committed undertaking. Despite all efforts, unintentional errors in various forms may appear in the journal. We ardently request our valued readers to pardon us for such unnoticed slights and shall consider ourselves rewarded to receive any evocative criticism. We hope that all papers included in this volume will be able to satisfy our readers.



Md Rashed Amin, OSP, rcds, ndc, psc
Major General
Senior Directing Staff (Army)

POLICY OPTIONS FOR TECHNICAL PROFESSIONALIZATION OF EME CORPS – TANGIBLY AND INTANGIBLY

Brigadier General S M Zia-Ul-Azim, ndc, afwc, psc

Bangladesh Army is undergoing expansion and modernization keeping pace with the changing security paradigm and national requirements. Forces Goal 2030 focuses on reform of the military organizations and training, expansion of forces size, acquiring modern weaponry and developing indigenous defense industries. To achieve the goal, parallel endeavor of professionalization of all Arms and Services is a must for Bangladesh Army. Similarly, Corps of EME must strive for technical professionalization - both tangibly and intangibly for being a significant contributor in achieving Forces Goal 2030 and beyond.

The main objective of this research is to identify the policy options for technical professionalization of Corps of EME, Bangladesh Army considering both tangible and intangible factors. It addresses the main research question: What are the means of technical professionalization for EME Corps leading to a policy formulation guideline? This is an exploratory research following interpretive approach of a qualitative research. Research methodology mainly includes Focus Group Discussion (FGD) and In-Depth Semi Structured Interviews beside a comparative case study of few other Army's EME Corps. Through this research it has been revealed that, to ensure quality support with technically qualified experienced officers, all Field Workshops need to be up graded, EME officers to soldiers ratio must be improved from 1:44, EME officers' authorization must be increased through proposed restructuring and better intake of EME officers to be ensured for inclusive development of Bangladesh Army. Training requirements outlined in this research are comprehensive training plan and implementation, early attainment of technical qualification, modernizing training infrastructure and training aids etc. Study also suggested reduction of military equipment 'Varieties' and 'Brands' in Bangladesh Army up to a manageable level to facilitate maintenance, repair, expertise development and spare parts supply. Thus, through this research a number of policies has been suggested which may be formulated and strictly adhered to.

Keywords: Forces Goal 2030, Corps of EME, Technical Professionalization, Policy Options.

RECENT CYBER ATTACKS AND CYBER SECURITY STRATEGIES OF BANGLADESH: A CRITICAL ANALYSIS

Brigadier General A B M Humayun Kabir, ndc, psc, te

The present world cannot deny the inseparable duality of technology bearing benefits and adverse effects. Extensive use of internet and social media has opened a new horizon called cyber space. An offensive maneuver in the cyber space is termed as a cyber attack that targets information systems, infrastructures, and associated devices. This may be planned for stealing, altering, or destroying information, blackmailing, harassing, cheating, etc. Government of Bangladesh has leveraged the use of ICT to achieve the vision of 'Digital Bangladesh'. The exponential growth of internet has led a significant rise of cyber attack related incidents with hazardous consequences. Despite enormous efforts, Bangladesh is yet to curb the increasing trend of cyber attacks. Therefore, the focus of this research is to analyze the dynamics and trends of recent cyber attacks and cyber security strategies of Bangladesh, identify the limitations and weakness, and provide recommendations to ensure cyber security in Bangladesh. The research is carried out following the qualitative method and analytical approach by data analysis, case studies, web exploration, journal paper studies, field survey and key informant interviews. It is found that several cyber attacks slackened the cyber space of Bangladesh in recent years. Despite the existence of National Cyber Security Strategy since 2014, lack of specific implementation plan, cyber security awareness, security education framework and inadequate legislative framework are hindering to combat cyber threat effectively. The most comprehensive approach for Bangladesh would be 'Top-Down Coordination, Bottom-Up Collaboration' to ensure cyber security. A wider coordinating platform like Cyber Command and Identification of Critical Information Infrastructures should be materialized for meaningful collaboration among different stakeholders. Government should plan to create cyber awareness, prepare a skilled set of cyber security professionals, and create continuum of job opportunity for the experts. Strong bilateral and multilateral engagement and structured coordination and cooperation architecture with global & regional alliances are essential. Furthermore, Research & Development effort should be enhanced both in public and private sectors with specific aim and objectives.

Keywords: Cyber Attacks, Cyber Space, Cyber Security, Cyber Awareness, Cyber Security Strategies.

SOCIAL MEDIA ADDICTION IN THE ARMED FORCES: BRINGING TOGETHER OR DRIFTING APART, CHALLENGES AND WAY FORWARD

Brigadier General Mohammad Kamrul Hasan, SGP, ndc, hdmc, psc

The world has experienced significant progress in information and communication technology where social media has assumed a fundamental role in today's society. Indeed, the use of social media in the society is on the rise because thinking life without social media is extremely difficult. Social media not only offers positive things to mankind but also causes many disadvantages. Coming from the same society, officers of Armed Forces are also equally sufferer from the overuse of social media. If the officers become heavily dependent on social media or become addicted then it will have negative impact on interpersonal relationship among officers posing serious leadership challenges. Therefore, it becomes pertinent to carryout research to identify the state of addiction, its impact on interpersonal relationship among officers, various challenges and ways forward. The main objective was to determine the leadership challenges faced by Armed Forces due to the negative effects of social media addiction among officers. A good number of relevant literatures have been reviewed, and both quantitative and qualitative methods of research were combined with a mixture of Survey, FGD, Content Analysis, Interviews and Case Study. Officers of Bangladesh Army, Navy and Air Force with different age groups and service length were taken as population sample. Generally the trend of using internet and social media is found to be on the rise. Indeed, tendency is to overuse and ultimately get addicted where majority officers were found using internet to pass time only. Besides, junior officers were found using internet more than the senior officers. Such overuse/ addition makes officers self-centered and isolated, which is seriously affecting the interpersonal relationship among officers, and causes serious impact on physical and psychological dimensions of individuals including their professionalism. Addictive use of social media also poses number of leadership challenges i.e. leadership vacuum in near future where a complete new generation will come up without developing interacting relations with peers or under commands. Considering the implementation, applicability and effectiveness, measures applicable for improving the situation in Armed Forces should be considered from three angles i.e. Institutional Programs, Individual Initiatives and Active Measures.

Keywords: Bangladesh Armed Forces, Social Media Addiction, Interpersonal Relationship, Leadership Challenges.

THE UNITED NATIONS PEACE OPERATIONS: OPPORTUNITIES FOR BANGLADESH

Brigadier General Md Aftab Hossain, BSP, ndc, afwc, psc

Bangladesh is participating in UN Peace Operations (UNPOs) for the last three decade and has emerged as one of the leading troops contributing countries (T/PCCs). The transformation of UNPOs from ‘traditional’ to ‘multidimensional peacekeeping’, is offering new opportunities at the same time posing multidimensional challenges which are affecting T/PCCs like Bangladesh in enhancing contribution to UNPOs. This study aims to investigate how to enhance the role of Bangladesh in UNPOs by overcoming those challenges. In doing so, the main research question, the study has examined is, how Bangladesh benefits from the evolving nature of UNPOs in the Post-Cold War era. Based on the past experiences in UNPOs and frequent deployment for ‘In Aid to Civil Power’; it seems Bangladesh has the potentials to explore the opportunities offered by transformation of UNPOs which is the prime focus of the research. A plethora of literature has been reviewed and observed that those have mainly dealt with the global aspects of UNPOs but have not focused about the opportunities and challenges of developing countries who play a vital role in UNPOs. Against this backdrop, the study has investigated the opportunities and challenges of Bangladesh in providing service to UNPOs. This is a qualitative study analysing both primary and secondary data. The key argument of the analysis is: Bangladesh has the opportunities to contribute more in UNPOs despite multidimensional challenges emanating from the changing scenarios in the global context. To exploring the opportunities, Bangladesh should respond appropriately with the strategy that would enhance contribution in UN peacebuilding activities and be conducive for continued bilateral relations with the war-torn host nations even after termination of the UN missions. It demands Bangladesh to enhance her diplomatic effort with UN/regional organisations by establishing more embassies especially in African countries. In addition, she should equip her contingents, emphasis on skill development on French and Arabic language, pursue for higher level posts at UN system etc. The participation in the peacebuilding tasks under UN umbrella would be supportive for establishing and continuing bilateral relation in other sectors like in military to military cooperation, socio-economic development, trade and commerce, restoration of basic infrastructure etc. by employing NGOs and other relevant departments/organisations. A prudent strategy with work plan at national level and its harmonised execution can enhance Bangladesh’s contribution in UNPOs which is essential for persuading national interest.

Keywords: UN Peace Operations, UN Peacebuilding, Bangladesh, Opportunities, Challenges, Post-Cold War era, Bilateral Relation, Host Nations, Regional Organisation.

ADAPTATION TO CLIMATE CHANGE: AN ANALYSIS OF STRATEGIES TAKEN TO ADDRESS THE ADVERSE EFFECTS OF CLIMATE CHANGE IN BANGLADESH

Additional Secretary Khorsheda Yasmeen, ndc

The effects of human induced climate change have now become a global threat. Due to the huge emission of green-house gases by burning fossil fuels, the temperature of earth is rising up and causing climatic variation; as a result, human health and ecological balance has now come into danger. Bangladesh is a low-lying agrarian country located in the Ganges-Brahmaputra-Meghna river basins. Its geographical location, densely population and struggling economy make the country more vulnerable to the adverse effects of climate change. The threats show increasing of frequent flood, cyclones, heavy rainfall, salinity intrusion, drought, livelihood and biodiversity losses, reducing wetlands, and agriculture and food security in Bangladesh. Thus, these issues will be affecting the national security by any means. To address these adverse impacts, several types of adaptation initiatives have already been undertaken by the Government. This study aims to find out the existing scenario of initiatives taken, their prospects and challenges and justify them in terms of beneficial of the targeted community. Literatures, Policy documents, Publications and unpublished papers on adaptation to climate change in Bangladesh have been reviewed. Moreover, Key Informant Interview (KII) from the Ministry of Environment, Forest and Climate Change (MoEFCC) and other concerned departments have been taken into consideration. As identified key findings in the study, MoEFCC has been playing a lead role by involving concerned Ministries, Divisions and other Governments, Non-Government Organisations and Academics in order to reduce the vulnerabilities of communities by taking effective strategies in terms of policy formulations, channelling monetary flow and implementing projects. Most of the initiatives were urgently need based. However, damages related to disaster are increasing day by day; strategies are to be revisited. Research based on a comprehensive intervention is needed to get the optimum result to face the future challenges.

Keywords: Climate Change, Adaptation, Vulnerability.

PROSPECTS OF WIDER REGIONAL COOPERATION WITHIN THE AMBIT OF CPEC - OPPORTUNITIES AND CHALLENGES FOR PAKISTAN

Brigadier Muhammad Shareef, ndc

The regional landscape of Asia Pacific is complex, muddled and impalpable owing to immersion of regional and global powers. Further complicating the canvas is the extraordinary rise of China, presenting both opportunities and challenges. Chinese vision of Belt and Road Initiative (BRI) emancipates shared economic future and integration. It is themed on collective prosperity through connectivity embedded in Maritime Silk Route (MSR) and Silk Road Economic Belt (SREB). In this overall progressive grandeur scheme, Pakistan finds itself as the key driver of visualized dream manifested through flagship China Pakistan Economic Corridor (CPEC). CPEC within ambit of BRI is not only conceived as an exclusive mega project for Pakistan, but also as an inclusive project for bringing shared prosperity to immediate region and beyond through connectivity. However, operationalization of CPEC and turning Pakistan into a trade transit hub remains entrenched in tackling internal challenges linked to unwavering political will, immaculate policies and undeviating practical manifestation. In this context, this study endeavours to find true potential of CPEC and Pakistan in the backdrop of regional connectivity, integration and economic prosperity while taking full cognizance of geo-political impasses. The study brings forth that regional connectivity and economic interdependence through CPEC have potential to foster political integration, peace, stability and conflict resolution with immediate neighbours. However, competing interests of regional / global players and resulting instability inhibits regional neighborhood connectivity and greater economic integration; warranting a prudent approach in diplomatic domain for forging convergence of interests with all stakeholders. The study further highlights that connectivity translates into sustained economic growth only if premium is placed on industrial development, enhanced production capacity and exports. Moreover, mere connectivity does not render economic progress unless backed by effective governance and development of human capital.

Keywords: Belt and Road Initiative (BRI), China Pakistan Economic Corridor (CPEC), Regional Connectivity.

ASYMMETRIC WARFARE AT SEA: SRI LANKA NAVY MARITIME SECURITY STRATEGY, IMPLICATIONS AND WAY FORWARD

Commodore Mahamudalige Herby Nishantha Peiris, ndc

The purpose of this paper is to identify the range of primary security issues in the Indian Ocean (IO) region and the maritime strategy of Sri Lanka Navy (SLN) in order to mitigate all challenges which possess by state and non-state actors whether in traditional or non-traditional form. Paper illustrated mostly on asymmetric nature non-traditional maritime security threats in general and affects to maritime domain of Sri Lanka (SL) in particular. Geographical location of SL is representing an important place in the Indian sub-continent as situated at right center in IO. SL has a huge accountability and responsibility of careful overlooking on the IO and its maritime domain. Sustaining maritime environment is a significant aspect as country lies close to main sea lane connecting the east and the west. SLN being the prime maritime force, it need to play a vital role in order to ensure maritime security. In this context, maintain of security in the ocean is of paramount of important and very much significance to greater degree as impact of maritime threats directly affects the national security of the nation. Further, this paper shows, unique opportunity of the country to play a significant role on maritime security affairs in the regional geo strategic context in related to her position under the back drop of the SLN experienced on Asymmetric Warfare (AW). The paper further discussed on the impact and capabilities of SLN whilst identifying the diverse and alternative strategies which could be used to counter the current and future maritime security threats.

Keywords: Indian Ocean Region, Sri Lanka Navy, Maritime Strategy, Non-traditional Security Threats, Asymmetric Warfare.

FIGHTING BEING OUTNUMBERED: CHALLENGES AND OPTIONS FOR BANGLADESH ARMY

Colonel Md Ehsanul Haque, SUP (BAR), afwc, psc, PhD

Technological advancement and invention of various forms of warfare strategies in recent past make the difference between numerical superior and inferior militaries blur. Therefore, the increasing possibility of winning a war against a superior military being outnumbered is a rising concern in military world. It is more applicable for Bangladesh as she is neither an invader, nor can go for an arms race with her numerically superior adversaries. The purpose of the study is to examine the challenges of Bangladesh Army to win a war being outnumbered

against her superior adversaries and devise suitable strategies based on key enablers to increase the success probability. Using mixed-method approach, this exploratory research analyzed suitable strategies to mitigate the challenges to fight being outnumbered and thus increased the success probability. From the study, it was found that the success probability of BD Army while fighting being outnumbered can be increased by the adoption of strategies based on key enablers. The research definitely answers the questions related to suitable strategies for mitigating challenges and win against the superior adversaries being outnumbered. The strategies were constructed upon a few key enablers like training, doctrine, innovation, leadership, equipment, and logistics etc. were studied through a mathematical model based on different scenario. Further studies are needed to analyze the possible strategies to devise suitable strategies for all three services in a joint environment to win a war being outnumbered.

Keywords: Fighting Being Outnumbered, Success Probability, Fighting Smart, Shuai-Jan Strategy and Enablers.

VIRTUAL TRAINING PLATFORM WITH VIRTUAL REALITY AND AUGMENTED REALITY FOR PEACE TIME TRAINING: A FEASIBILITY STUDY FOR BANGLADESH ARMY

Lieutenant Colonel Md Khalid Saifullah, afwc, psc, Sigs

This research focuses on two military training related leading-edge issues: feasibility study of the potentials of Virtual Training Platform (VTP) with Virtual Reality (VR) and Augmented Reality (AR) pedagogy for peacetime training in the context of Bangladesh Army and examining the possibility of blending the inhabitant existing training and VTP to make training more effective and efficient. In conjunction with inhabitant training, VTP is intended to replicate conventional training experience through direct learning methods. In consensus, the researcher identified problem statement as 'Potentials of VTP-with-VR and-AR pedagogy in preparing more effective peacetime training are not ascertained in the context of Bangladesh Army'. Concerning the problem statement, core objective of this research was to delineate the method of adoption of VTP for enhancing Bangladesh Army's peacetime training. This is exploratory research with causal relation, where a mixed method has been adopted. Initially, the researcher explored the gamut of VTP's conception and found that it will be able to enrich soldiers' cognitive domain, can augment the peacetime training requirement and aid in dealing with capacity constraints. It can provide adequate change in knowledge from learning point of view (self-paced, self-stimulation and action-reaction). Cost-Benefit Analysis (CBA) also indicates

that it would comply with organizational needs and impact on organizational change implications on training. Adoption of this training pedagogy will have various challenges in implementation process, like, IT competency, IT culture, economy of effort, consensus/mind-set of making change and security. This study evident that Bangladesh Army is also interested to reap maximum benefit out of this dynamic pedagogy to meet its training challenges. Besides, a blended environment combining present inhabited training and VTP would be more viable option for Bangladesh Army. Finally, a road map has been proposed with milestone goals to implement the plan by spanning time framework of short, mid and long term. Here, ARTDOC must play a pivotal role in coordinating with other training organizations and stakeholders. However, its implementation will require a visionary approach and sheer dedication at all levels.

Keywords: VTP with VR and AR, Peace Time Training, Bangladesh Army, Blended Training Environment.

LESS CAPABLE LARGER UNITS VIS-À-VIS MORE CAPABLE SMALLER UNITS FOR BANGLADESH ARMY

Lieutenant Colonel Mohammad Farid Uddin, SUP, afwc, psc, Engrs

The operational environment as well as the defence policy of Bangladesh with 3D demand a credible Army for deterrence, military diplomacy and defeating hostile design. However, the operational efficiency of Bangladesh Army (BA) is in question due to larger units with less fighting power. To fight and win against the potential adversaries, BA needs units with cutting edge hybrid capabilities which will be smaller in size but highly adaptive, flexible, efficient, and effective. In quest to find the answers, the objective of the research is set, 'To suggest the restructuring of the units with a view to enhancing the fighting power of Bangladesh Army'. In the course of research, it was revealed that there are critical shortfalls and weaknesses in the fighting power of the units of all arms and services which needs due attention. Within limited scope, only Infantry and Division Engineer Battalions are analyzed in details to propose the new structure. In the process, the study established positive correlation between more capable smaller units and fighting power of Bangladesh Army. The research proposed that the units of Bangladesh Army may be reorganized and implemented as stated in this study. Additionally, skill oriented, effect based, small group and sub-unit level operational training should be introduced in Bangladesh Army which will ensure deterrence and 'fight to win'.

Keywords: Restructure of Forces, Modernization, Deterrence, Hard Core and Soft Core Capability, Fighting Power.

**PSYCHOLOGICAL OPERATIONS BY BANGLADESH ARMY
IN CHATTOGRAM HILL TRACTS: CHALLENGES AND
WAYS TO INTEGRATE ELEMENTS OF NATIONAL POWER
IN CONFLICT RESOLUTION**

Lieutenant Colonel Golam Mohiuddin Haider, afwc, psc, Inf

Chattogram Hill Tracts (CHT) is a diverse region of Bangladesh in terms of ethnicity, culture and topography. Since the birth of Bangladesh, CHT has always been disquiet over the identity quandary of the Ethnic Minority Groups (EMGs) and their subsequent indulgence in active insurgency. After twenty one years of atrocious insurgency, CHT Peace Accord was signed on 02 December 1997. Since then, the region has observed relatively stable security environment except sporadic miscreant incidences at infrequent intervals. Presently, Bangladesh Army is aiding Government agencies and conducting conventional form of tasks along with limited Psychological Operations (PsyOps) in CHT under the mandate of 'Operation UTTARAN'. On the contrary, Propaganda Campaign of the EMG appears to be more effective at times. EMGs' propaganda activities are desperately attempting to generate commotion amongst the common mass of CHT which is likely to have deleterious insinuations on the peace and security of the region, if not addressed with urgency. In solving such complex phenomenon, although various 'elements of national power' of Bangladesh had been working since long, presence of discontent in the region justifies that the employed efforts were not at all synchronized or integrated. Absence of synergy amongst various 'elements of national power' seems incoherent and not meeting the ultimate objective of conflict resolution. It demands an 'Integrated Wholesome Approach' encompassing relevant stakeholders of 'elements of national power' on board. This is a causal study which followed both quantitative and qualitative methodologies using surveys, interviews and focus group discussions as major tools. Initially, it analysed the effectiveness of ongoing PsyOps activities by Bangladesh Army and GoB agencies on contrary to the propaganda campaign of the EMGs. Subsequently, it considered contemporary strategies related to PsyOps along with the success stories of Malaysian and Sri Lankan insurgency. Thereafter, it explored the ways and means to integrate various 'elements of national power' in the overall PsyOps effort of CHT. Furthermore, it also revealed the challenges of such integration and suggested plausible measures to develop an 'Integrated Wholesome Approach' towards CHT conflict resolution. This paper certainly has policy connotations; however, it is envisaged to contribute to a great extent while enhancing overall PsyOps scenario of CHT.

Keywords: Psychological Operations, Propaganda Campaign, Ethnic Minority Groups, Integrated Wholesome Approach, Elements of National Power, Conflict Resolution.

STUDY ON COUNTERING MARITIME HYBRID THREAT AT SEA: A COMPREHENSIVE APPROACH BY BANGLADESH NAVY

Commander A K M Ikramul Hossain, (G), afwc, psc, BN

The ‘Hybrid War/Warfare’ describes the ‘blurring character’ of contemporary conflicts which is predominantly asymmetric, multi-domain and multimodal forms of war. However, as of now, there is no single and agreed-to meaning of it. Besides, no significant research on hybrid warfare in the maritime domain could be found that describe the roles and efficacies of maritime forces during such a situation. Geopolitically sited in a hybrid environment, getting involved in a conflicting situation with hybrid characters is not unlikely for Bangladesh. In such condition, the maritime domain being highly porous would suitably benefit any aggressor whether ‘state’ or ‘non-state’ to manifest hybrid threats. Thus, the ‘Maritime Hybrid Warfare’ (MHW) is a distinct possibility in the maritime front of Bangladesh. Bangladesh Navy (BN) presently does not have any doctrinal guidelines or strategies to counter likely MHW threats in maritime front. Thus, finding an appropriate approach to counter such threats was taken as the objective of this study. Though none of the literature could directly suggest a suitable method, dealing with such multi-domain and multimodal form of MHW would necessitate a comprehensive approach involving all relevant instrument of national power was the hypothesis of the study. A ‘Mixed Method Approach’ featuring both ‘Theory and Data Triangulation’ an ‘MHW countering model’ was constructed as a fundamental mechanism to detect, deter and respond against any hybrid threat. Identifying the gaps in the capabilities of stakeholders in effectuating the model, the study as a novel endeavour proposes a set of approaches which collectively devises a ‘framework of comprehensive approach’ against the MHW threats. Realising such a framework through proper analysis and study, BN would develop particular capabilities to identify, resist and respond to likely MHW threats in the maritime front of Bangladesh.

Keywords: Maritime Hybrid Warfare (MHW), Maritime Hybrid Threat, Hybrid Actor, Comprehensive Approach, MHW Countering Model, Stakeholders’ Essential Capabilities, Capability Gap, Whole-of-Govt. Approach.

CHALLENGES AND PROSPECTS OF SMALL AIR FORCE IN THE 21ST CENTURY: BANGLADESH AIR FORCE PERSPECTIVE

Group Captain Md Muktasim Billah, afwc, psc, GD (P)

Throughout the last century, uncountable technological changes have influenced the aviation sector in general and Air Forces in particular. Besides, the new security environment in the 21st century has ushered in a compelling paradigm shift globally in security concept and defence. Air Forces being technology-based are facing many challenges to cope with the same pace. However, these changes have also brought opportunities and prospects. These challenges and prospects are even more significant for the very effectiveness of smaller Air Forces in particular due to inherent limitation of their capability and budget, Bangladesh Air Force (BAF) is no exception. The purpose of this research is to find out the security challenges of the 21st century being faced by small air forces, vis-a-vis their prospects and options to remain effective by mitigating those challenges, particularly for BAF. A mixed-methods convergent parallel approach is used to achieve the best result. The primary data are collected through survey method and interview. Whereas content analysis from publications, books, periodicals, open sources on the internet have been used as secondary sources. It is found that due to limited natural resources, economic constraints, evolving geopolitical situations, environmental degradations etc. Bangladesh faces huge challenges to maintain its armed forces, especially effective Air Force. Innovative trends in science and technology have put additional challenges on acquiring novel platforms and compatible gadgets. BAF may adopt a comprehensive modernization plan in three phases, “Preserve, Promote and Procure”. Besides, BAF is to continue its supports for HADR and UNPSO. For future implications BAF may choose to incorporate UAVs, asymmetric warfare capabilities, invest heavily in R&D, Soft power, defence indigenization, and space programme. For a small air force, it is more viable to integrate and grow airpower holistically with other services and organizations of the state.

Keywords: The 21st Century, Technological Challenges, Small State, Small Air Force, Bangladesh Air Force (BAF), Modernization, UAV, Asymmetric Warfare, Synergistic Approach.

POLICY OPTIONS FOR TECHNICAL PROFESSIONALIZATION OF EME CORPS – TANGIBLY AND INTANGIBLY

Brigadier General S M Zia-Ul-Azim, ndc, afwc, psc

Introduction

Corps of Electrical and Mechanical Engineers (EME) was born during the Second World War to meet the battlefield challenges of maintaining, recovering, and re-circulating the equipment to the battlefield. It was born out of necessity at the very crucial moment to keep the punch in the army's fist. Corps of EME, Bangladesh Army is inherited from the British Army through Indian via Pakistani Army. This corps provides effective and efficient technical support to all military equipment through repair, recovery, and inspection. Bangladesh Army is being restructured according to its 'Forces Goal 2030'. To meet this goal, all Arms and Services of Bangladesh Army need 'Professionalization'. Similarly, the Corps of EME also needs 'Technical Professionalization'. Through this research, an in-depth study has been carried out on the technical professionalization of Corps of EME, Bangladesh Army. In doing so, both tangible and intangible aspects have been scrutinized to suggest the formulation of necessary 'Policy Options'.

The future army will be more mechanized and technologically heavy. Modernization of army doesn't mean buying modern military hardware only-if these can't be operated and maintained effectively these are of no use less being liabilities. The Corps of EME is a technologically capable service of Bangladesh Army as far as present maintenance load is concerned. But it has to be strengthened further to meet the forthcoming challenges of increased load envisaged to meet 'Forces Goal 2030' and beyond. Thus comes the obvious necessity of dynamic and innovative policy intervention for deriving the maximum benefits out of EME Corps.

In 1999 and 2008 on behalf of the Bangladesh Army, the EME Corps took over and restarted ‘Bangladesh Machine Tools Factory’ (BMTF) and ‘Bangladesh Diesel Plant’ (BDP) limited from layoff states and made them operational. So restructuring, capacity enhancement and modernization of EME Corps have to be undertaken through analysis of the present capability and weaknesses pursuing a comprehensive ‘Perspective Plan’. Thus, it is essential to determine the future need/goal of the Corps of EME, including the ways and means to prepare tech-savvy Engineers and Technicians, to maintain Bangladesh Army as envisioned in the ‘Forces Goal 2030’.

Review of Literatures

There are a number of literatures available in connection with professionalization, training methods, training policy, management techniques, capacity building and so on. Brigadier General Shameem Ahmed in ‘Director Electrical and Mechanical Engineer’s Training Instruction 1/2020’, March 2020 gave the prime training guideline for the officers and men of EME Corps for ‘Training Year 2020’ with a view to ensure battle-worthiness of Bangladesh Army. In Army Training and Doctrine Command’s ‘ATM 00-0201; Manual of Qualification 2016 (Revised)’, November 2016, technical training and promotion criteria for JCOs, NCOs and ORs of the Corps of EME are included in a separate specified chapter. Meaningful guidance for this research work could also be obtained from Ruth Colvin Clark’s book: ‘Evidence-Based Training Methods: A Guide for Training Professionals’, Second Edition’, Association for Talent Development (ATD), Virginia 22314, USA, 2017 (ISBN: 978-81-309-3014-5). Brigadier General A I M Mustafa Reza Noor in his Individual Research Paper of National Defence Course 2000: ‘Adoption of Modern Management Techniques in Bangladesh Army’, August 2000 also searched for the possibility of introducing modern management techniques in Bangladesh Army to optimize achievements towards national objectives. Finally, Individual Research Paper of Brigadier G R H Dias of National

Defence Course 2013: ‘The Need for an Effective Training Policy for Military Officers in South Asian Region: The Case Study of The Sri Lanka Army’, August 2013 provides the philosophy of professionalization that also stands good for technical training applicable in EME Corps, Bangladesh Army.

Research Methodology

This will be exploratory research following interpretive approach of a qualitative research. Textual scrutiny of both primary and secondary sources of related information to arrive at deductive explanation will be the main focus of the paper. Primary sources include Focused Group Discussion (FGD), Participants Observation and In-Depth Semi-Structured Interviews. FGD conducted at Army Headquarters EME Directorate who work at decision making level of the Corps of EME. Participants Observation includes the researcher’s own experience as Commandant EME Centre & School, the premier training institute of EME Corps. A total of Thirty Two (32) officers have been interviewed out of an in-depth semi-structured questionnaire. It included policy makers, Brigade Commanders, Commanding Officers and senior/experienced serving EME Officers. The secondary sources include content analysis of relevant books, research papers, manuals (including Manual of Qualification), organograms, training syllabus, related policies etc. It also included case studies of Corps of EME/technical support providers of a number of allied countries. Analyzing all these, efforts have been made to formulate policy options for technically professionalizing the Corps of EME to extend optimum support to Bangladesh Army in the days to come.

Discussion

In-Depth Semi-Structured Interviews. The world is experiencing a whole new set of experiences due to COVID-19 pandemic situation. It is offering us new opportunities and hinting to change our habits of work.

This is becoming a new normal that we work from our home. At this backdrop, due to lockdown situation, ‘In-depth Semi-Structured Interviews’ were conducted via e-mail and cell phone. The researcher first mentally shortlisted the possible respondents according to their appropriateness and access. To get versatility of response, COs and Brigade Commanders were selected from Corps of Infantry, Artillery, Armoured and Engineers. Suggestions were also collected from 14 officers senior in rank and/or in service experience from Corps of EME. These officers have given best of their time of service life in making the Corps of EME what it is today. Policy makers due to their position and placement view from the top and holistically, not in bits and pieces. With their professional acumen and experiment they view any issue from various angles and decide to take the most appropriate action for overall benefit of the organization. Thus suggestions were collected from 09 senior ranking officers who served at different capacities in the policy making level through ‘In-depth Semi Structured Interview Questionnaire’.

Suggestions from DGMS about Army Medical Corps. At the backdrop of specialist doctors’ acute shortage and increased patients entitlement, AMC is recruiting specialist doctors as ‘Special Purpose Direct Entry Officers’ directly as Majors beside the Regular Officers. Candidates having less than 40 years of age with post-graduation degree (FCPS, MS, MD, PhD) in any sub specialty are of this kind. This may be an important takeaway for Corps of EME in addressing the issues relating to acute officers shortage and specialist service. Thus this instance has been included in this research taking suggestions from the horse’s mouth. Out of DGMS’s suggestions and instances of AMC, the takeaways for Corps of EME may be ‘Recruitment of Specialist Officers’, ‘Specialization and Super Specialist Trainings’, ‘R&D including Research Publications’ and ‘Close Monitoring by the EME Leadership’.

Case Study on Corps of EME, Bangladesh Army vis-à-vis Few Other Armies. A comparative study was done on EME Corps, Bangladesh Army and a few other Army’s EME Corps (Indonesian EME, Egyptian

EME, Indian EME, Sri Lankan EME and Nigeria EME) through a case study. It was done keeping in view that these armies are different having different sizes and different kinds of modernization and above all different sizes of budget. Finally the points we may consider to adopt in our army are summarized. A comparison of this kind of exposition reveal a few interesting realities and facts. Organization, structure, systems and approaches vary differently to accomplish the same mission similar to our one. What we have developed through 5 decades is noteworthy, even then some points may leave scope in formulating our policy options.

Training Packages of Navana Limited (Toyota) and Pacific Motors (Nissan). Both of these are distributors of famous brand of Japan automobiles Toyota and Nissan. They have their integrated training cells to impart quality training to their technicians on ‘Light Vehicles’ (‘B Vehicles’ as per category used in Bangladesh Army). Thus their training packages’ examples were scrutinized to tally with technical training imparted on ‘B Vehicles’ at EME C&S on which maximum repair and maintenance support is required in Bangladesh Army. Only takeaway may be ‘Refresher Trainings’ and ‘Train the Trainers’ training. For other technical trades of EME Corps beyond Technician B Vehicle (TBV), ‘Talent Hunt’ may be carried out from Vocational and Youth Technical Training Centers. Say 1st, 2nd and 3rd in the merit list graduating from these institutes may be recruited in EME Corps on a preferential basis.

Technical Professionalization of EME Corps: Tangibles and Intangibles

- **Rank Up-gradation of Field Workshop Officers.** A Field Workshop is the basic Unit of EME Corps and it is also the backbone of EME support system. Reality is that, there is acute shortage of officers in the Field Workshops let alone technically experienced officers. Currently, a Field Workshop is commanded by a Major who is the only mainstay of technical support system. Other than the Officer Commanding (OC) Major, hardly one or two Subalterns are usually

available in the Field Workshop, but their utility as far as technical matters are concerned is very limited. More so the OC remains so much committed to the unit administration that he hardly gets any time to exercise technical leadership. This badly affects the technical efficiency of a Field Workshop. Thus ensuring the presence of technically experienced and qualified officers in a Field Workshop is of utmost importance for providing quality EME support to the user units. On account of this, the rank structure of an Officer in an EME Field Workshop may be revised. Thus all Field Workshops may be upgraded with one Lieutenant Colonel in the command with 2 Majors and 2 Captains/ Subalterns to ensure quality support with technically qualified and better experienced officers. Such example already exists as 46 Independent Infantry Brigade is effectively and efficiently supported by 157 Field Workshop in Dhaka Cantonment.

- **Improving EME Officers to Soldiers Ratio.** For any Technical Arms/Service, Officers to Soldiers (Technicians) ratio needs to be high for ensuring efficient technical leadership resulting in quality output. Justifying this reality, among all the Arms and Services of Bangladesh Army, at the moment Army Medical Corps (AMC) ranks number One (01) having an Officers (Doctors) to Soldiers (Health Technicians) ratio of 1:7. On the other hand, as a matter of extreme concern - scenario in the Corps of EME ('Doctors of Military Equipment') is exactly the opposite. Because Bangladesh Army's equipment inventory is constantly enriching in terms of number, variety and updated technology, without increasing the capacity of Technical Service Providers. The number and types of equipment used by the Bangladesh Army has already outnumbered the available specialists and repair facilities to much of disproportion. This will ultimately improve EME Officer to Soldiers ratio and serve Bangladesh Army much better.

Table 1: Officers to Soldiers Ratio in various Arms/Services of Bangladesh Army			
Serial	Arms/Service	Officer to Soldier Ratio	Rank
1.	AC	1 : 16	2
2.	Artillery	1 : 20	3
3.	Engineers	1 : 31	7
4.	Signals	1 : 29	5
5.	Infantry	1 : 27	4
6.	ASC	1 : 29	6
7.	AMC	1 : 7	1
8.	Ordnance	1 : 38	8
9.	EME	1 : 44	10
10.	CMP	1 : 41	9
Army Average		1 : 24	

- Ensuring Better Intake of EME Officers.** Quality of ‘Officers’ Intake’ is extremely important for any Corps to flourish and provide quality leadership. For a highly technical Corps like EME, Officers are ‘Military Engineers’ who have provided both ‘Military Leadership’ as well as ‘Technical Leadership’ simultaneously. In doing so along with constantly facing the challenges of rapid technological advancement, quality officers’ intake is even more important. But in reality this issue is often ignored affecting the relative performance of EME Officers. Thus for the overall benefit of Bangladesh Army, ensuring better officers intake from BMA in the Corps of EME is a must. It has to be done through coordination between BMA, MS Branch and EME Directorate by distributing vacancies from various engineering disciplines to the potential EME Cadets.

- **Comprehensive Training Plan and Budget.** A Comprehensive Training Plan may be formulated by EME Directorate in conjunction with Military Training (MT) Directorate in terms of attaining vacancies and with Military Secretary (MS) Branch for selection of the appropriate trainees. This training have to be more focused and equipment-specific imparted to adequate number of officers and technicians. These should include Advance Training on major platforms already existing in Army inventory and Capacity Building Training for base overhauling. EME Directorate to ensure Long Duration Technical Training Abroad followed by Local Training for all ranks of EME Corps. The contract must also include one piece of the equipment as a Training Aid for large scale procurements or One Simulator for small scale procurement both for EME C&S. Tendency to curtail expenditure during procurement mostly affect procurement of ‘Spare Parts’ and provision of ‘After Sales Service’. It puts tremendous pressure on EME Corps to ensure timely repair though it saves some money temporarily. To avoid such long term negative impact, there must not be any compromise in these two aspects by expenditure curtail from procurement budget.
- **Early Attainment of Technical Qualification.** There is a well-designed plan and schedule for formal technical training of ‘EME Technicians’ through Courses and Cadres all around the year and every year. Throughout the year EME technicians undergo On the Job Training (OJT). But the earlier the technicians can be provided with formal technical trainings at EME C&S, the earlier would they be technically equipped, the better would be their quality of technical support and the sooner would they be able to serve. From this perspective, a ‘Comprehensive Training Plan’ may be formulated so that EME technicians can complete Basic Trade training (BTT) within first 3 years of their career and Advance Trade Training (ATT) within 6-7 years. To implement this plan, necessary revision of Manual of Qualification (MOQ) may also be done for the greater interest of quality EME support.

- **Separate Training Cell for Civilian Technicians.** In the Corps of EME, besides the military technicians, there are also a large number of Civil Technicians who serve in the Central, Medium and Combined Workshops. These technicians serve in one unit for a quite long duration and are hardly posted within these 3rd and 4th line workshops. Though there is well-structured and well-planned technical training curricula for the military technicians of EME Corps, there is no such organized training for this large number of ‘Civilian Technicians’. Thus it is a need of the time to establish a separate ‘Training Cell for Civilian Technicians’ working in huge numbers at the Central, Medium and Combined Workshops. In this aspect reference of Military Engineering Services (MES) may be followed.
- **Reducing Varieties and Brands of Military Equipment.** One of the major impediments to quality technical support by EME Corps is existence of too many varieties of multinational equipment with diverse models/technologies in military inventory. It is humanly impossible to grow expertise on all of those and support so many diversified equipment by insufficient technicians. Here EME Officers (Engineers) and Soldiers (Technicians) struggle to acquire required proficiency on each of these. Thus, to ease up repair support and spare parts management, reduction of military equipment Varieties and Brands in Bangladesh Army up to a manageable level is a need of time.

Results

Focus Group Discussion (FGD) Outcomes. Focus Group Discussion (FGD) was conducted with all the Takeaways for EME Corps, Bangladesh Army Discussable in FGD from suggestions of Brigade Commanders and COs, EME Officers, Policy Makers and the Case Study on Corps of EME, Bangladesh Army vis-à-vis Few Contemporary Armies. After scrutiny through this Focus Group Discussion (FGD), the Logically Reasoned Takeaways are short listed at the end of this Research Paper under the

head ‘Policy Options’. These are put forward as recommended inputs for Policy Options Formulation to Technically Professionalize EME Corps.

Takeaways from Case Study on Corps of EME, Bangladesh Army vis-à-vis Few Contemporary Armies (Indonesia, Egypt, India, Sri Lanka and Nigerian EME). Conducting Technical Interactive Forums (IF) by Corps Zone Workshops, Seminars and Conferences by AHQ EME Branch. Besides, induction of technical qualified tradesmen beside the main stream.

Takeaways from Policy Makers’, Brigade Commanders’/ COs’ and EME Officers’ Suggestions

- **Scopes of Improvement for EME Corps.** The crucial proportionality of manpower and the need for specialists has been highlighted here. Specifically these are as followings:
 - Specialized repair expert technicians to be retained in the service for longer period.
- **Tangible measures to Technically Professionalize EME Corps.** Out of all takeaways, the feasible and discussable tangible measures to technically professionalize Corps of EME are as follows:
 - Ensuring one Field Workshop to support one Infantry Brigade as per standard authorization. Up-gradation of all Field Workshops with one Lieutenant Colonel, 2 Majors and 2 Captains to ensure quality support with experienced officers.
 - One Combined/Medium/Area Workshop per Area to support Division units, Area Units and static installations including C&S.
 - Decentralizing of Base repair support by raising 4 more Central Workshops at Bogura (for 11 and 66 Division and Area), Jashore (for 7 and 55 Division and Area), Chattogram (for 10 and 24 Division and Area), Cumilla (for 17 and 33 Division and Area). Existing 901 Central Workshop will support Logistics Area, 9 Division and 19 Division including Savar and Ghatail Area.

- Raising One Marine Workshop and One Electro Medical Central Workshop to support all Marine and Electro Medical Equipment of Bangladesh Army.
- Issuing one equipment inducted newly in Bangladesh Army (at large scale) as training aid to EME C&S. This may be catered for during procurement.
- Intangible measures to Technically Professionalize EME Corps. The feasible and discussable tangible measures to technically professionalize Corps of EME are as follows:
 - Provisioning, Procurement and Supply of Spare Parts may be done by EME Corps (or following Army Aviation/UN procurement model). This needs further study by EME Directorate.
 - Trained technicians may be posted at appropriate places (where the equipment on which they are trained are available). This would enable them to develop expertise further. This is being done as far as possible.
 - Technicians may be kept in one unit for longer duration to develop expertise. EME Directorate is studying the possibility of Inter Division Rotation of Field Workshops which if implemented will solve this problem.
 - Rank structure in TO&E may be flexible, to promote maximum technically qualified people to next higher rank.
 - A fear free environment may be created to encourage technicians' initiative and innovations.
 - There is a need to prioritize technical skills over other general requirements. This may be ensured through appropriate reflection of their technical proficiency in APR.

Conclusion

Dimensions of ‘Tangibles Measures needed for Technical Professionalization’ are thought to be ‘Need for Restructuring Corps of EME’, ‘Need for Appropriate Infrastructures’, ‘Need for Workshops Modernization’, ‘Modern Diagnosis and Repair Edges’ and Appropriate Training Aids. Whereas the ‘Dimensions of Intangibles Measures needed for Technical Professionalization’ are thought to be ‘Specialization’, ‘Career Planning’ and ‘Training’ for EME officers and men, ‘Motivation’, ‘Rewards’ and ‘Penalties’.

Policy Options

- **General Appraisal.** All Arms and Services of Bangladesh Army need ‘Professionalization’ to achieve Forces goal 2030. Similarly, Corps of EME also needs ‘Technical Professionalization’ as projected army expansion will be undoubtedly mechanized and equipment oriented. All armies are virtually slaves to modernization where masters are the persons who know the tricks of the trade to keep them up and running i.e. the Corps of EME.
- **Policy Options Formulation.** Corps of EME aims at supporting our beloved Bangladesh Army meaningfully. This would require some restructuring and policy formulation. These are the final outcomes of Focus Group Discussion (FGD) and Researcher’s deductions sorting out proposals as minimum implementable for Bangladesh Army out of all the accumulated takeaways from ‘Interviews’ and ‘Case Studies’.
- **Proposed Restructuring and Infrastructural Development.** Restructuring and infrastructural requirements for EME Corps would encompass capacity enhancement of existing units and raising of new units proportionate to the predicted load of Forces Goal 2030 and Vision 2041. Parallely, acquiring modern test equipment, tools and repair facilities for all of these units is also proposed. As an outcome

of this deliberate research work, dimensions of Tangibles Measures needed for Technical Professionalization are thought to be:

- **Restructuring Corps of EME**
 - **Reorganization/Up gradation of Existing Workshops:** Ensuring one Field Workshop to support one Infantry Brigade as per standard authorization. Up gradation of all Field Workshops with one Lieutenant Colonel, 2 Majors and 2 Captains to ensure quality support with experienced officers. Medium/Combined Workshops by Colonels. Creating post of Deputy Commandant in Central Workshops.
 - **Workshops Already Proposed:** One Corps Workshop for each Corps, 903 Central Workshop for Bogura and Rangpur Areas, Air Defense Artillery Brigade Workshop for 7 ADA Brigade and One Composite Workshop for Bangladesh Army.
 - **Workshops Newly Proposed for Forces Goal 2030:** One Marine Workshop and One Electro Medical Central Workshop for Bangladesh Army.
 - **Other Workshops Proposed through this Research:** Three more Central Workshops at Jashore (for 7 and 55 Divisions and Areas), Chattogram (for 10 and 24 Divisions and Areas) and Cumilla (for 17 and 33 Divisions and Areas).
- Appropriate Infrastructures to be developed encompassing Multipurpose Academic Complex at EME C&S, Modern Electronic Laboratory, and Multipurpose Repair Sheds in all Workshops etc.
- Workshops Modernization, Modern Diagnosis and Repair Edges and making appropriate Training Aids available are also proposed through this research.

Proposed Policies to be Formulated. Followings are the proposed policies which may be formulated and implemented by the ‘Policy Makers’ and also need to be strictly adhered to:

- Capacity enhancement of existing units and Raising of new units proportionate to the predicted load of Forces Goal 2030. Acquiring modern test equipment, tools and repair facilities for all.
- Increasing EME Officers authorization through proposed Restructuring. This will ultimately improve EME officer to soldiers’ ratio which is 1:44 at the moment.
- Ensuring Better Officers Intake from BMA for ensuring quality support to the Army. It may be done through coordination between BMA, MS Branch and EME Directorate.
- Mitigating EME technicians’ deficiencies by Personnel Administration (PA) Directorate immediately by increased recruitment. One of the recruitment considerations may be ‘Talent Hunt’ from ‘Vocational and Youth Technical Training Centers’. Say 1st, 2nd and 3rd in the merit list may be recruited in EME Corps on preferential basis.
- Comprehensive Technical Training Plan by EME Directorate in consultation with MT Directorate. It should include long duration training during procurement of modern equipment.
- Reducing military equipment ‘Varieties’ and ‘Brands’ up to a manageable level. This is a major impediment to quality technical support by EME Corps.
- Establishing a separate ‘Training Cell for Civilian Technicians’ working in huge numbers at the Central, Medium and Combined Workshops. In this aspect reference of MES may be followed.
- Enrolling few ‘Direct Entry’ Officers (MSc/PhD) and JCOs/NCOs (Diploma/Post Diploma) like AMC. EME Directorate is already working on this.

- Issuing one piece of equipment inducted newly in Bangladesh Army as training aid to EME C&S. This may be catered for during procurement at AHQ level.
- Ensuring ‘Long Duration Technical Training’ and no curtail of expenditure for spare parts procurement and after sales service during procurement.
- Putting Ordnance Supply Store (OSS) under command of supported workshops by AHQ order. This would be similar to command structure of Workshop Sections and UROs (as under command of supported unit/installation).
- Putting appropriate emphasis on technical skills by ensuring proper reflection in APR and Quality Based Promotion.
- Conducting ‘Technical Interactive Forums’ by AHQ EME Directorate through Video Tele Conferencing (VTC) like ‘AHQ Study Periods’. Besides, ‘Technical Study Periods’ conducted by EME Workshops at various formations may also be attended by all EME officers and technicians through VTC.
- Keeping Technicians in one unit for longer duration to develop expertise. EME Directorate is studying the possibility of Inter Division Rotation of Field Workshops which if implemented will address this issue.
- Retaining Expert Technicians at a limited scale and for a justified period. This would help getting expert technical support for the Army a little longer.
- Upon improving training infrastructure and attaining increased capacity, EME C&S may conduct Refresher Training and Train the Trainers packages.

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Author

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RECENT CYBER ATTACKS AND CYBER SECURITY STRATEGIES OF BANGLADESH: A CRITICAL ANALYSIS

Brigadier General A B M Humayun Kabir, ndc, psc, te

Introduction

Extensive use of the internet and social media has opened a new horizon called cyberspace. An offensive maneuver in this space is termed as a cyber attack that targets information systems, infrastructures, and associated devices. This may be planned for stealing, altering, destroying information, blackmailing, harassing, cheating, etc. A cyber attack can be employed by individuals or groups or organizations or an anonymous source. They may also be state actors or non-state actors or state sponsored actors as outsiders or insiders. Only a trained set of manpower following defined process and using appropriate technology can effectively fight against cyber-attacks. The Government of Bangladesh has leveraged the use of ICT to achieve the vision of 'Digital Bangladesh'. A Study of the few mentionable cyber attacks that took place in Bangladesh in recent past indicates that Bangladesh is in a vulnerable state in the cyber domain.

To ensure cyber security, the Government of Bangladesh has already published several statutory documents like ICT Act 2006 (Anon., 2006), National ICT Policy 2009 (Anon., 2009), National Cyber Security Strategy (NCSS) 2014 (Anon., 2014), Government of Bangladesh Information Security Manual (GoBISM) 2016 (Anon., 2016), Digital Security Act 2018, etc. Act No 46 of the Year 2018 (Anon., 2018) is dedicated to addressing the wider area of cyber security recommending preventive measures to block undesired data and also the formation of national computer emergency response team (CERT), digital forensic lab, national cyber security council (NCSC), etc. Despite enormous efforts, Bangladesh is yet

to curb increasing trend of cyber attacks. This necessitates conducting a detailed study on the recent cyber attacks and cyber security strategies of Bangladesh.

The objectives of this study are summarized as follows:

- To investigate the recent cyber attacks, analyze them to find their dynamics and trends, and identify the reasons behind their occurrences.
- To study the cyber security strategy guide, acts, laws, standards, and best practices available across the globe with special emphasis to Bangladesh.
- To identify apparent weaknesses of cyber security strategies and their application in Bangladesh.
- To suggest ways for Bangladesh to mitigate cyber security threats.

Literature Review

A Systematic Literature Review approach was followed to identify, evaluate, and interpret all available works relevant to this issue. It listed out the related books, articles, publications, previous research works, and then key concepts are derived. From the literature review, it is identified that an insignificant amount of study was conducted focusing Bangladesh on cyberspace vulnerabilities, the pattern of attack, technical competency and validating the enacted cyber security strategy in detail.

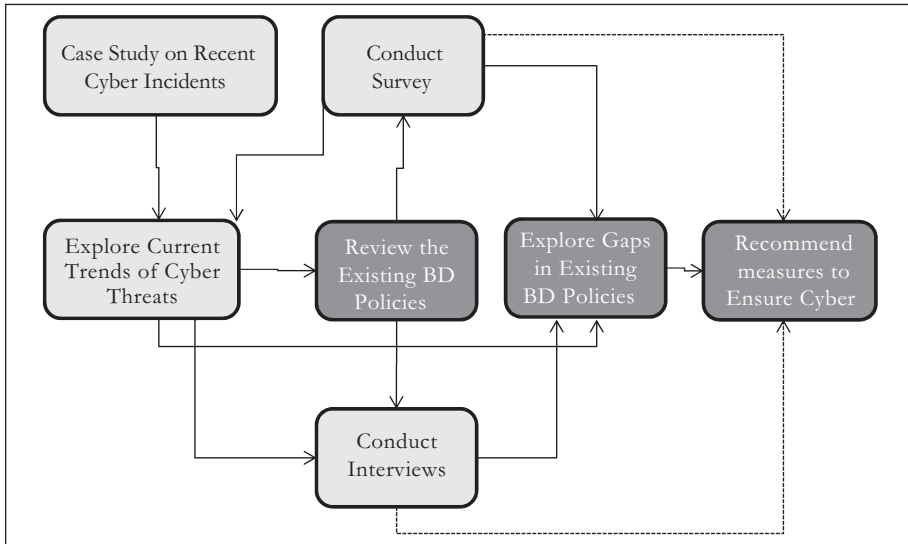
Seemma, et al (Seemma, et al., November 2018) made an endeavor to define cyber threats, cyber criminals, cyber security and explained the need for cyber security. Rohit, et al. (Rohit, et al., 2019) discussed the significant trends of cybercrimes and the consequences by analyzing gathered information and data of different attacks of the last five years. Haque (Haque, February 2019) analyzed the common vulnerability issues. Bhuiyan (Bhuiyan, et al., January 2016) analyzed the government initiative according to ITU guidelines. Ahmed, et al (Ahmed, et al., December 2017)

identified a low-level public awareness of standard practices and drills after an in-depth survey both online and offline. Nabi & Islam (Nabi & Islam, August 2017) presented the major challenges of cyber security initiatives and the effectiveness of current Acts & Laws. Cyber security has emerged as a national policy matter rather than a pure computer security issue. The Australian Cyber Security (ACS) Guide put emphasis stating that ensuring a secure and successful environment is the ultimate responsibility of every government, industry, intellectual institution, and entity around the world (Anon., November 2016).

Research Methodology

The research is carried out following the qualitative method and analytical approach: web exploration, journal paper studies, data analysis, case studies, field survey and key informant interviews (KII). The study suggests not any technical solution but mainly a national approach to address the cyber security. The research methodology predominantly employs secondary research techniques in collecting data and information. These include content analyses of reports of the government, non-government and international organizations, previous research works, books, journal papers, newspaper articles, etc relating to the topic concerning Bangladesh.

The case studies are performed on a number of recent cyber attack incidents in Bangladesh and field survey is carried out on ICT firms/industries to assess the weaknesses of existing security arrangement, state of awareness amongst the users, identify the areas of vulnerabilities and trend of recent threats in Bangladesh. KIIs of the concerned government agencies and cyber security analysts are also carried out to get the expert opinion on the findings. The study of legislative documents, strategy guidelines, standards, and best practices of international body like International Telecommunication Union (ITU) on the subject including their concerns are also taken into consideration to find out the apparent weakness of our strategies. The process is shown in the diagram.



CASE STUDIES ON RECENT CYBER ATTACKS IN BANGLADESH

Bangladesh Bank Cyber Heist by Malware

In February 2016, the attackers committed an unprecedented cybercrime exploiting the security weaknesses of the Bangladesh Bank. The attacker requested the New York Fed to send money from Bangladesh Bank through 35 payment orders worth \$1 billion (Hill, 2018). The New York Fed stopped 30 of the payment orders and requested Bangladesh Bank for clarification. Meanwhile, they have processed 5 orders. Worth \$101 million was stolen by the hackers. Bangladesh Bank could retrieve \$15 million so far from the Philippines. One of the orders that went \$20 million to Pan Asian Bank in Sri Lanka with misspelled account holders name as “Fandation” instead of “Foundation” and was not successful (Anon., 17 April 2019).

Defamation and Hate Speech in Social Media

A violent mob carried out a synchronized attack on the minority community based on fake news of defaming religion on Facebook in Bangladesh. In September 2012, at Ramu Upazila, Cox's Bazaar, at least 6 Buddhist temples and nearly 20 homes were damaged in the hate attack (Anon., September 2012). At Bonogram, Pabna in November 2013 more than 25 Hindu houses and several idols in temples were damaged. At Homna Upazilla, Cumilla in April 2014 at least 28 Hindu houses were ransacked (Anon., April 2014). At Nasirnagar, Brahmanbaria in October 2016 more than 150 homes, at least 15 temples were damaged. At Thakurpara, Rangpur in November 2017 one person was killed, and at least 30 Hindu houses were burned (Minar & Naher, March 2018). At Bhola, in October 2019 at least 4 people were killed, and a hundred others were injured (Anon., October 2019) .

Hacking of Websites

In 2016, the attacker gained control of the Website of Department of Printing & Publications and defaced the website. In 2017, attacker hacked the Website of Civil Aviation & Tourism (Anon., 17 June 2017), Jashore Board of Intermediate & Secondary Education, Safety Net System etc. In 2018, the attacker attacked the Website of BSMMU and National Curriculum & Textbook Board. The attacker successfully breached the database and was able to perform read/ modify /delete operation on the website database.

Impersonation of Top Officials of Bangladesh

In recent years, attackers targeted the top officials by impersonating, creating a fake Facebook accounts, email hacking, spreading fake news to defame the personality, etc. Using the social media platforms, criminals find it easy to defame the top officials without much hindrance.

Cyber Attack at National Data Centre

The attacker attacked the National Data Centre number of times in recent years. Some of the notable incidents are shown in table-1:

Table 1: List of attackers at National Data Centre		
Ser	Year	Means of Attack
1	2016	System root privilege, Ransomware, SQL injection, Remote Command Execution vulnerability, etc
2	2017	Email spam, Shellshock vulnerability, Sudo privilege escalation vulnerability, etc
3	2018	Brute-force, Local File Inclusion vulnerability, SQL injection, etc

The attackers were able to perform read/ modify/ delete operation on the website database and compromised the secret keys to encrypt the content of the file.

Findings from the Field Survey and KII

A field survey, web exploration, study on related materials and KIIs were conducted to assess the actual state of vulnerability, security arrangement, trends & statistics of cyber attacks, state of awareness and competency of LEAs in Bangladesh. Field survey on 30 diverse categories of ICT industries were selected.

Vulnerability of Organizations against the Best Practices

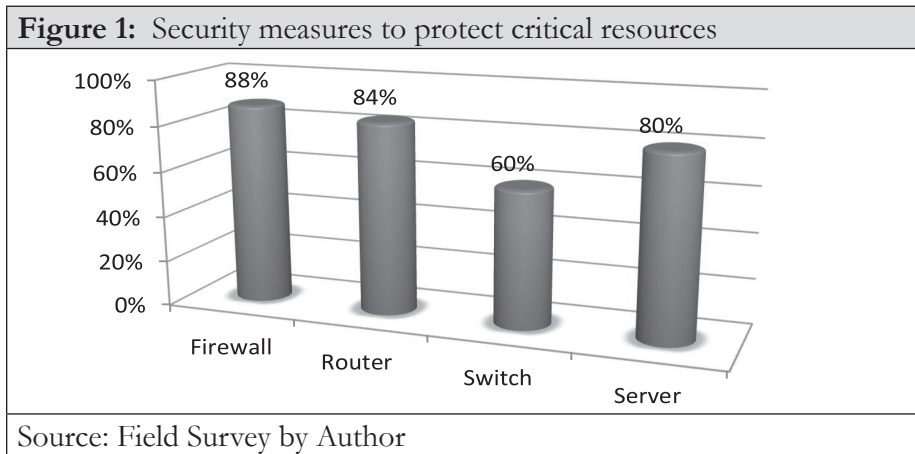
A recent study by the author found that 36% organizations do not use licensed operating system (OS) in their server and desktops/ laptops.

Linux OS has the potential to be better secured than Windows OS. In a survey, it is found that 62% of the companies use Windows Servers which makes the organization more vulnerable, 33% use Linux and 5% use other servers.

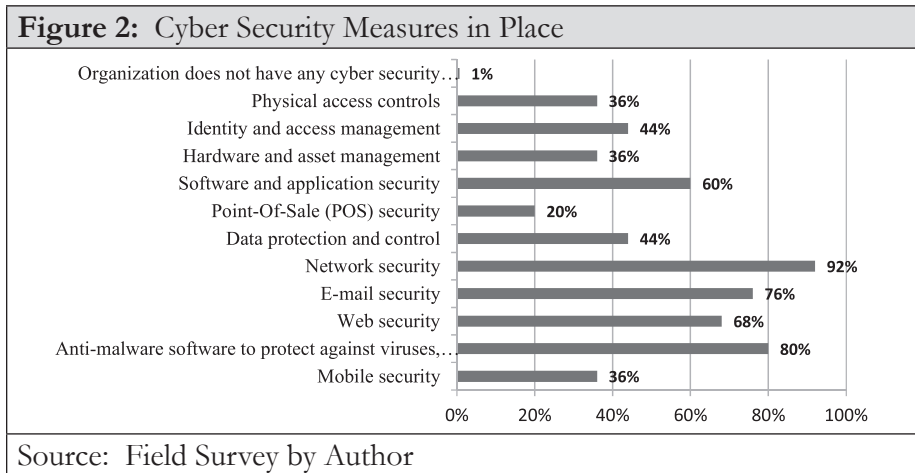
It was found amongst best-reputed companies that only 52% users occasionally change their login password within a year and 48% users change their log in password frequently in every month.

Existing Security Arrangement against Cyber Threat

Many financial and IT companies ignored the required level of protection against cyber threat (Figure 1).

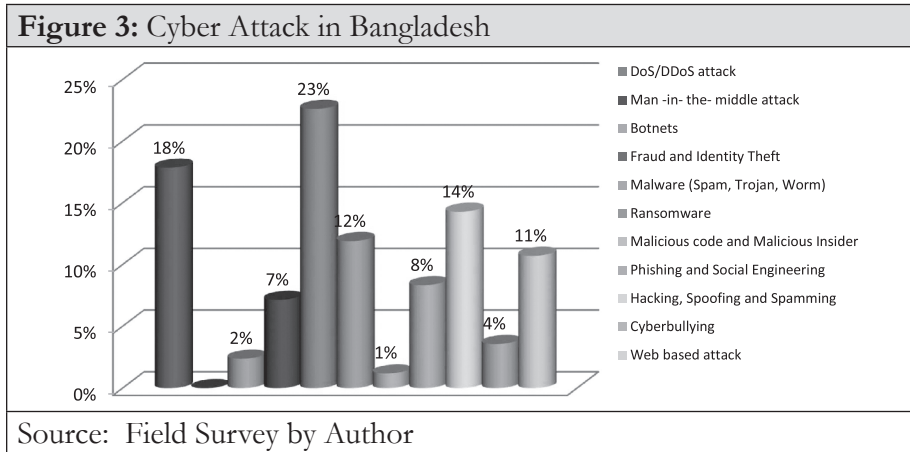


Many of the important security areas are not well protected due to a lack of awareness and initiative (Figure 2).



Trends of Recent Cyber Attacks in Bangladesh

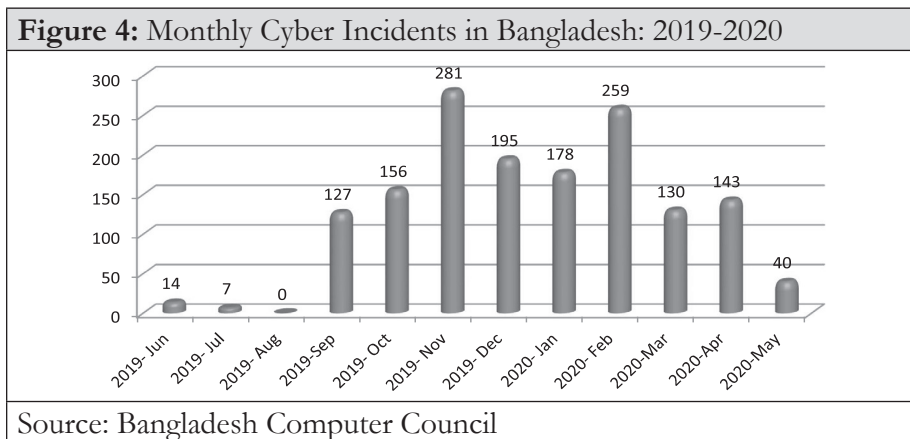
Different IT firms/ industries faced the highest attacks by malware (Figure 3) portraying the incapability of systems to protect.



the survey shows that 63% of participants have experienced phishing emails. Others experienced attack on their Facebook/ WhatsApp account.

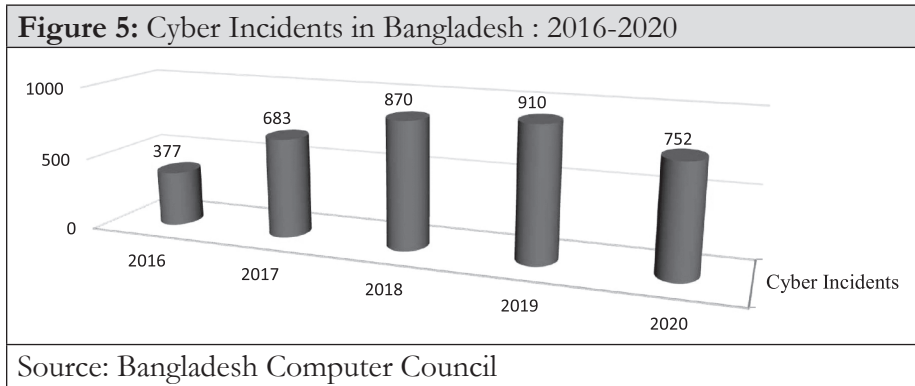
Statistics of Monthly Cyber Incidents in Bangladesh

According to BGD e-GOV, the highest threat was in November 2019 (Figure 4). However, February 2020 is seen a spike in the attack.



Statistics of Yearly Cyber Incidents in Bangladesh.

The trend of cyber incidents is in the inclination (Figure 5) according to BGD e-GOV. It is evident that incident in 2020 has already surpassed 2017 account within 6 months only.



State of Awareness

Due to lack of cyber security awareness, 30% of companies, despite using licensed OS, do not update regularly which leaves the organization vulnerable to attackers, 15 % using at least once a month and 55% using occasionally.

Internet users too often “blindly” trust ICT and Internet services and take it as guaranteed the online fake news. This indicates the lack of awareness, ignorance, and unwillingness towards verification of the authenticity of such defaming posts/ activities.

National Technical Competency

The only established Computer Security Incident Response Team (CSIRT) in Bangladesh for handling incidents within the public sector is the BGD e-GOV CIRT. The e-GOV CIRT has initiated a project namely “cyber gym” whose main task is to create a platform where CII can simulate attacks on

their network, enabling a range of exercises for crisis management (Anon., 2018). Government has recently completed a project titled ‘Cyber Threat Detection and Response’ (CTDR) (Anon., 08 October 2018). Cyber defence capacity in Bangladesh is at the formative stage. Competencies of LEAs to combat cyber threats were identified in infant stage. There is also lack of coordination amongst LEAs, Intelligence Organizations, BGD e-CERT, CII Owners, Regulatory Bodies, etc.

CYBER SECURITY STRATEGIES IN BANGLADESH

Existing Cyber Security Strategies of Bangladesh

Every country requires a stable, reliable, and resilient ICT infrastructure to protect itself from cyber related crimes. The NCSS 2014 is published (Anon., March 2014) which outlines a framework of a few strategic areas focusing on national cyber security framework development, securing government infrastructure, cyber security skills & training development, and establishment of the public private partnership.

Comparison of NCSS of Bangladesh against ITU Guidelines

The template proposed by ITU ‘Strategy Guide’ only articulated the first three priorities and suggested rest of the two (Capacity Building and International Cooperation) or any additional ones could be adopted depending on national conditions, local needs and cyber security priorities (Toure, May 2007). In its NCSS, Bangladesh also adopted the first three priorities. A summary of the above is given in table 2:

Ser	NCSS of Bangladesh	The ITU NCSS Guide	
		Heading	Section
1.	Executive Summary	Statement of Purpose	21.3
2.	Strategic Context	Strategic Context	21.4
3.	Goal	Example of a Generic End	21.5.1.1
4.	Purpose of Strategy		
5.	Ways - Priorities	Ways – Priorities	21.6
6.	Cyber Security Priorities	Cyber Security Priorities	21.6.1
7.	Priority 1: Legal Measures	Priority 1: Legal Measures	21.6.2
	Action 1: Cybercrime Legislation	Action 1: Cybercrime Legislation	21.6.2.1
	Action 2: Government Legal Authority	Action 2: Government Legal Authority	21.6.2.2
8.	Priority2: Technical and Procedural Measures	Priority 2: Technical and Procedural Measures	21.6.3
	Action1: National Cybersecurity Framework	Action 1: National Cybersecurity Framework	21.6.3.1
	Action 2: Secure Government Infrastructure	Action 2: Secure Government Infrastructure	21.6.3.2
	Action 3: Critical Information Infrastructure Protection	Action 3: Critical Information Infrastructure Protection	21.6.3.3

Table 2: Comparison of NCSS of Bangladesh against ITU Guidelines

Ser	NCSS of Bangladesh	The ITU NCSS Guide	
		Heading	Section
9.	Priority3: Organizational Structures	Priority 3: Organizational Structures	21.6.4
	Action1: Government’s Cybersecurity Role	Action 1: Government’s Cybersecurity Role	21.6.4.1
	Action2: National Cybersecurity Agency	Action 2: National Cybersecurity Agency	21.6.4.2
	Action3: National Incident Management Capacity	Action 3: National Incident Management Capacity	21.6.4.3
	Action4: Public-Private Partnerships	Action 4: Public-Private Partnerships	21.6.4.4
	Action 5: Cybersecurity Skills and Training	Action 5: Cybersecurity Skills and Training	21.6.4.5
	Action 6: National Culture of Cybersecurity	Action 6: National Culture of Cybersecurity	21.6.4.6
10.	Not Addressed	Means- Actions	21.7

Comparison of NCSS of Bangladesh with few Technologically Developed Countries

Different countries have taken different measures to make their NCSS. Few of the basic criteria of the selected countries (USA, UK, Australia, Japan, Malaysia, Singapore, and India) are chosen for cross-comparison (Table 3) as the comparison vector (Sarker, et al., May 2019).

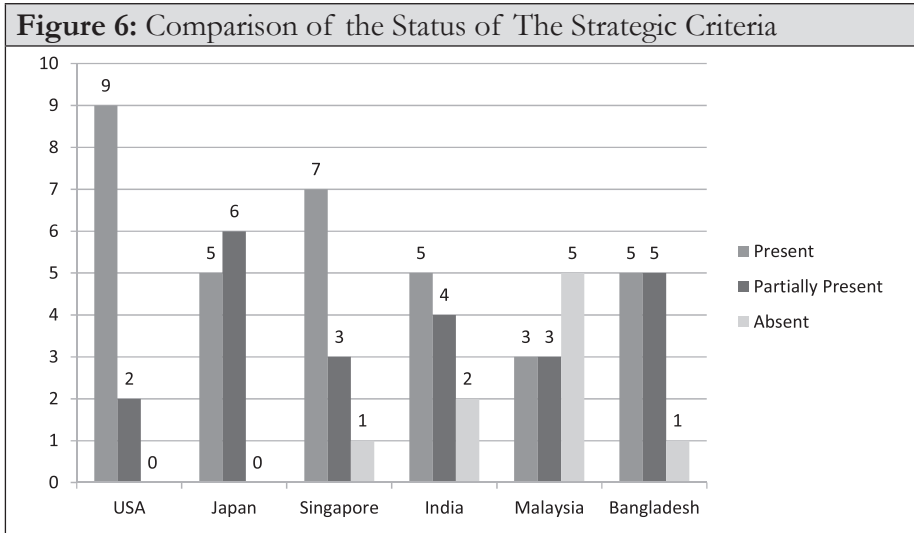
Table 3: Comparison of NCSS based on a few selected Criteria

Comparison criteria	Status	USA	Japan	Singapore	India	Malaysia	Bangladesh
1. Promote Cyber Security R & D	Present	√	√	√	√		
	P.present				√	√	
	Absent						
2. Promote Cyber Security Education	Present	√	√	√	√	√	√
	P.present						
	Absent						
3. Ensuring ongoing Risk Assessment	Present	√		√			√
	P.present	√		√	√		
	Absent						
4. Promote counter Cybercrime Policy	Present	√					
	P.present	√	√	√		√	
	Absent				√		
5. Promote Cyber Security in International Law	Present	√					
	P.present	√				√	
	Absent		√	√	√		
6. Forms of Regulation and Institutional Aspects	Present	√	√	√	√	√	√
	P.present						
	Absent						

Table 3: Comparison of NCSS based on a few selected Criteria

Comparison criteria	Status	USA	Japan	Singapore	India	Malaysia	Bangladesh	
7. Balancing Cyber Security with Civil Liberties	Present	√	√	√				
	P.present					√		
	Absent			√	√			
8. Types of Cooperation	Public Private Platform	√		√			√	
	Inter govt Cooperation	P.present		√		√		
		Absent				√		√
	Regional Cooperation	Present				√		
		P.present	√	√	√		√	
	Intra-Govt Cooperation	Absent		√	√	√	√	√
Present		√	√	√	√	√	√	
P.present								
Absent								

The chart below (Figure 6) shows the status of 11 categories and subcategories of the strategic criteria of six countries” (Anon., n.d.).



Weaknesses and Limitations in Applicability of NCSS in Bangladesh

Our NCSS 2014 is of global standard and it is following the GCA by ITU. Despite having good strategy, the study identified a few limitations as discussed below:

ICT Dilemma

In Bangladesh, ICT Division deals with IT policies, Post and Telecomm Division (PTD) deals with telecommunication policies, and BTRC controls the networks and services. Until well-coordinated, efforts are duplicated or even triplicated in some areas, and void prevails in some; both are detrimental to progress.

Framework for Implementation of NCSS

A national level cyber security framework is in place according to the strategy action point, but still now there is no such framework formulated to materialize the strategy. Without a well-thought-out framework, it is very difficult to achieve the target.

National Cyber Security Coordinator (NCSC) and Role of National Cyber Security Council (NCC)

The NCSS suggests a Senior Aide perform as the NCSC who would report to NCC, have direct access to the Head of the Government, and provide strategic leadership to ensure coherence of cyber security activities across the government. The position of NCSC has been created but none is appointed yet to address the challenges. On the other hand, the NCC is expected to plan and coordinate the security of infrastructures, provide incident response capacity, as well as act as the National Technical Authority. If this is to be the Apex Body for cyber security, it may be difficult for the NCC to perform at both policy and functional levels as a policymaker, planner, coordinator, and executer.

Coordination Mechanism between and among Different Entities

The key role players in Bangladesh include the Ministry of Home Affairs, ICT Division, PTD, BTRC, LEAs, Intelligence Agencies, Service Providers, and the User Agencies. There are definite efforts by all, but in absence of a wider coordinating platform (sort of Cyber Command), most are working in relative isolation, and the efforts are falling short in achieving synergy. This dearth of coordination may be considered as the single most important shortcoming at present.

Public Private Partnership and Collaboration between & amongst Stakeholders

Though our strategy set a specific action point on public private partnership, more detailing is missing here. The specific ways of collaboration between those stakeholders might boost up the execution of strategy which seems to be absent. Cross regulatory and cross industry collaboration is an effective way to secure the cyber space which is missing in our cyber security strategy.

Cyber Defence, Cyber Police and Cyber Court

Though in the NCSS, Cyber defence effort is highlighted, but no detailed framework is outlined to protect the cyber space in Bangladesh. There is no indication of ‘Cyber Police’ and ‘Cyber Court’ in the strategy. Though police and judicial system have separate cyber division, conventional policing and judicial system may not be always instrumental to handle cybercrime.

Mapping out of CIIs and their Vulnerability Assessment

The NCSS recognizes CIIs but there are no official procedures in place to identify which infrastructures are key and should be considered as CII. Coordination within CII owners and between CII owners & the government, in relation to cyber security threat and vulnerability disclosure is absent.

CIRT and CTDR

In absence of the vulnerability assessment, any comprehensive and effective plan to prevent cyber incidents and respond to those is yet to be articulated. National CIRT is still in formative stage and CTDR has limited capability of filtering ‘http’ content only.

Governance and Legislative Framework

Only 15 / 495 cases were proven in Cyber Tribunal at Dhaka since February 2013 and the conviction rate is about 3%. Weak enforcement of prevailing Laws & Acts is contributing to failing to safeguard the recent cyber attacks in Bangladesh.

National Cyber Security Education Framework

The government has not yet materialized the action item of the NCSS, and a coordinated Cyber Security Education Framework is not yet in place. In the primary and secondary school level students have one subject on ICT which does not cover cyber security, despite many children and teenagers use smartphones, tab, laptops, etc.

Mass Awareness Program

Awareness raising programs regarding cyber security are very ad-hoc and not specified for different target groups. Local government unit, different ministries, organizations, universities, and the educational institutions are missing the action plan to perform a role to aware the mass people, younger generations, civil society, and the private sector.

Regional and Global Alliance

No country can ensure cyber security all by itself. Bangladesh is yet to engage with any such agencies significantly and meaningfully.

Research and Development (R & D)

In case of R & D, Bangladesh has taken a more generalized approach than a specified one. Lack of specific approach limits the initiative and innovativeness on R&D in the cyber domain.

Recommendations

- The NCSS may be materialized as soon as possible with a well-articulated implementation plan including the employment of National Cyber Security Coordinator.
- A wider coordinating platform like Cyber Command may be established for effective and meaningful collaboration and coordination between & among different Stakeholders.
- Identification and Mapping out of CII's need to be completed soon. A well-defined coordination mechanism needs to be set within & between CII owners and the government.
- CIRT and CTDR may be made fully functional delineating specific responsibilities and emphasis may be put on establishing adequate number of sector specific CIRT.
- The Government may plan to prepare a skilled set of Cyber Security Professionals/ Workforce and create a continuum of job opportunity for the experts to encourage talents to step into cyber security profession. A Cyber Defense Academy for cyber training including certification courses may be throughout.
- Lessons on cyber security may be included in the national education curriculum starting from the secondary level. A single online portal may also be set up to disseminate materials for educational curriculum, ICT literacy courses and cyber security awareness program.
- BGD e-CERT should develop global and regional alliance by developing meaningful cooperation & collaboration with global and regional cyber security outfits.
- R&D effort may be enhanced both in public and private sectors with specific aim and objectives. A central government owned R&D Cell may collaborate the efforts.

Conclusion

Several cyber-attacks slackened our cyberspace due to poor security features of the system and software vulnerability. In Bangladesh, digital culture is not deep enough amongst the common mass and a low-level public awareness of standard practices and drills exists. The most comprehensive approach for us would be ‘Top-Down Coordination, Bottom-Up Collaboration’ to ensure cyber security. We need to establish a Cyber Command by integrating government, military, LEAs, and private industries. Finally, heavy investment on research and development may gain strength to combat impending cyber threat in the coming days.

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SOCIAL MEDIA ADDICTION IN THE ARMED FORCES: BRINGING TOGETHER OR DRIFTING APART, CHALLENGES AND WAY FORWARD

**Brigadier General Mohammad Kamrul Hasan, SGP, ndc,
hdmc, psc**

Introduction

The world has experienced significant progress in information and communication technology where social media has assumed a fundamental role in today's society all over the world. Technology has advanced so much that with a fraction of a moment we are connected with people around the globe through the internet and social media. Nowadays, people starting from youngsters to mid-ages pass a considerable time on social media. The Armed Forces are also affected by the same phenomenon as the officers over a period have become more dependent on social media. While there are numerous other negative aspects of social media, one point is generally not understood clearly is; are we connecting or disconnecting by the overuse of social media? If the officers become heavily dependent on social media or in other words become addicted to it then this will have serious implications which will significantly degrade interpersonal relationships among officers posing serious leadership challenges in turn.

Due to technological advancement, people can instantaneously reach out to other people far away from them to connect over different issues. Instead of geographical separation, people are indeed separated by screens and gadgets. No doubt that people are more connected than ever, but they are more disconnected and lonelier than ever too. In the Armed Forces, the group is more important than the individual. That's why in the leader-led framework, interpersonal relationships among officers play a very

vital role, which is unfortunately affected by the extensive use of social media or in other words social media addiction. Therefore, it becomes pertinent to identify the negative effects of social media, especially on the interpersonal relationship among officers in the Armed Forces. Researching on the subject is significant because unless the problem is addressed, the Armed Forces as credible forces and institutions will fall short in displaying required professionalism and meeting the expectation of the nation. The main objective is to determine the leadership challenges faced by the Armed Forces due to the negative effects of social media addiction among officers.

Literature Review

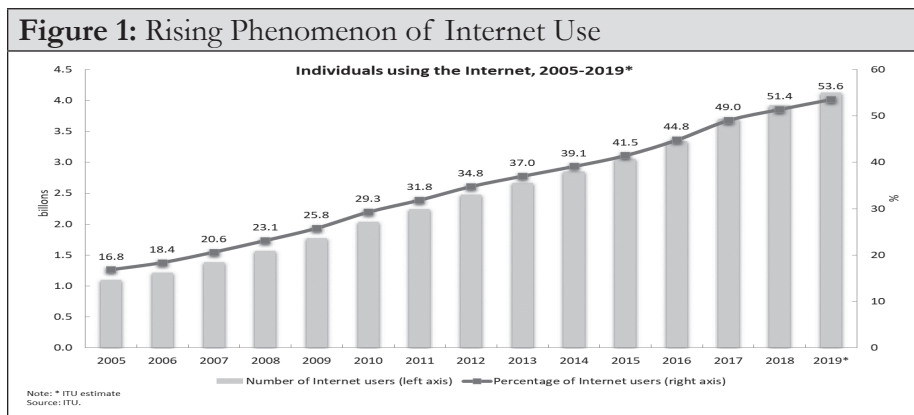
For conducting this research, a number of relevant literatures have been reviewed to get a clear insight into this topic. In addition, different pieces of literatures available in open domain i.e. online journals, thesis papers, articles and other relevant literatures have also been studied. Analyses and references of social media guidance by different Headquarters were also taken into consideration. For better comprehension, the subject matter is defined and some statistical data from the open sources were analyzed to identify the root of social media in the society and the Armed Forces. Literatures review is carried out following a combined thematic and chronological approach i.e. Social Media and Society, Social Media Trend, Social Media Addiction, Social Media and Military Profession, Social Media Usage Regulation.

General Findings

The literature review revealed the interesting fact that social media is becoming more and more essential for us to remain connected in the current world. Up to a certain limit the use yields positive outcome but past that point it becomes counterproductive by imbibing our precious time and energy. No doubt that social media has penetrated well in society and

there is no exception for the military as well. The nature of social media itself in most of the time is addictive because social media attracts people in such a way that at times, it becomes difficult for people to extricate from its addiction, which is seriously hampering better purposes like social activities, developing interpersonal relationship, acquiring knowledge and pastime activities. The same addiction is also pronounced in the Armed Forces. Important areas of concern revealed from the literature review are given below:

- Addiction to social media is a general phenomenon which is on the rise (Figure 1).
- Social media has its impact on soldiers.
- Social media seriously affects social life.
- Young officers have tendencies to overuse social media.
- Social media increases interpersonal communication.
- Social media has a substantial impact on society also.
- The use of the internet affects individual performance.
- The use of the social media affects moral values.
- Control of the use of social media contributes to organizational security.
- Addiction to social media affects the relationship between officers and men.



Research Gap

After a methodical study of available and related literatures, it was found that researches were mostly carried out on the effects of social media relating to professional knowledge, moral values and national level of security etcetera. Not many studies were carried out on identifying the negative impact on interpersonal relationships among officers due to addiction of officers to social media vis-à-vis leadership challenges faced by commanders at various levels.

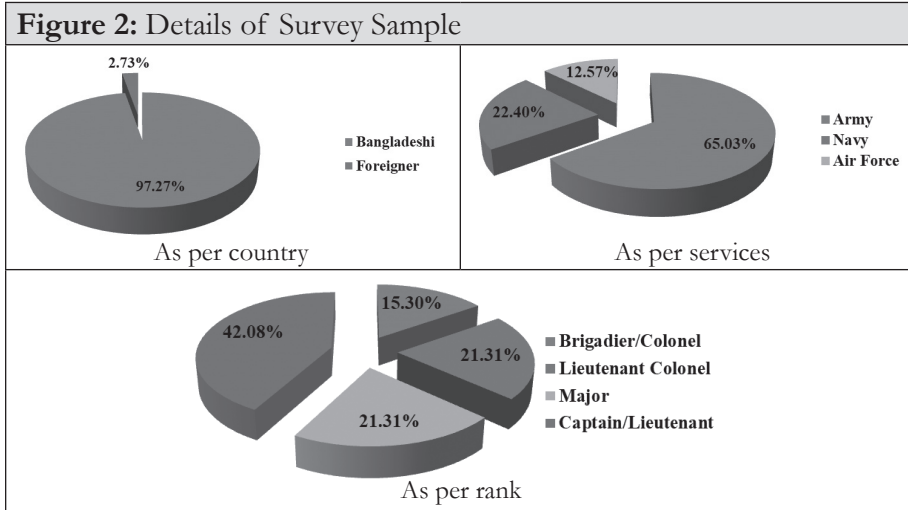
Research Methodology

Research Design

The research was conducted following a combination of quantitative and qualitative approaches using cross-sectional descriptive design. The research was based on a mixture of Survey, Content Analysis, Interviews and Case Studies, which were used extensively for both quantitative and qualitative process. Questions/Statements were designed to measure the use of internet, its addiction, negative impacts, and functional challenges on leaderships.

Sampling Design

Officers of Bangladesh Army, Navy and Air Force with different age groups and service lengths were taken as population sample with the aim to obtain a comprehensive '360 Degree View' on the subject. But, due to the pandemic situation, only 183 responses could be obtained (Figure 2).



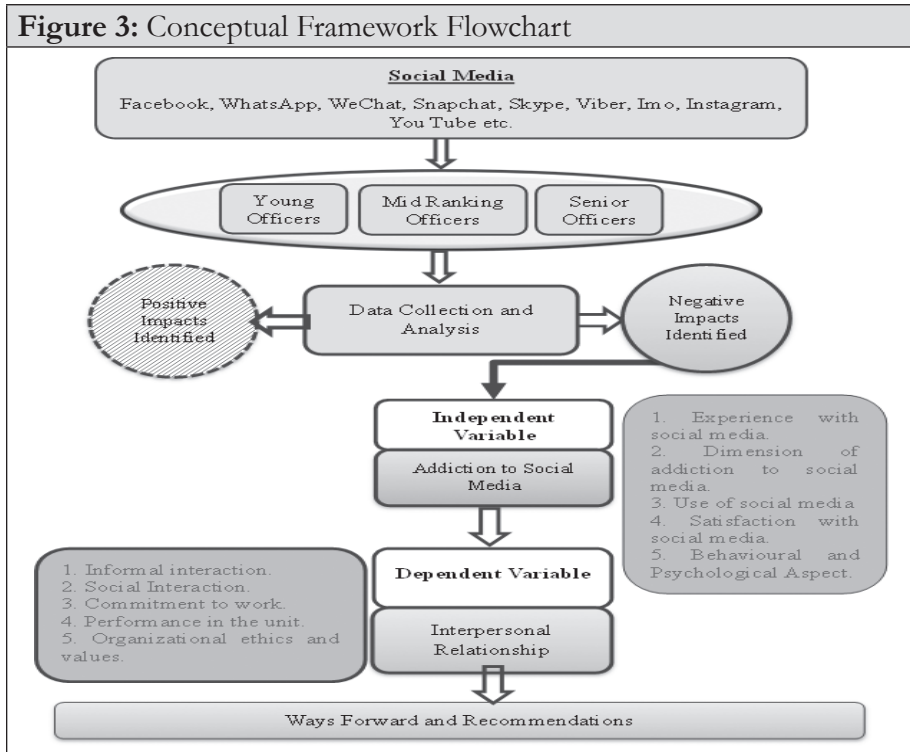
Data Collection Method

A quantitative method was adopted, as was best suited to measure the correlation between the variables. And, a qualitative method was adopted to find out the challenges and ways forward. Five-point Likert scale (1–5) was used with respect to 5Qs Model of Impacts where questions scores ranged from 1 for ‘Strongly Disagree’ and 5 for ‘Strongly Agree’. The data was collected in Google form which was circulated to the concerned sample personnel via social media. To obtain world view and expert opinions on the subject, interview/interactions were conducted during different phases of the study. Interview with Brigade Commanders and Commanding Officers of the field brigades/units were conducted over telephone to find resonance with the surveyed data. Besides, Textual Analysis was also used to identify opinions given during the survey and interviews.

Conceptual Framework

The conceptual framework of this research is hinged upon the “Leadership challenges faced by the Armed Forces due to negative effects of social media addiction among officers”, which essentially form the concept of the research. The independent parameter is “Addiction in social media among

the officers of Bangladesh Armed Forces,” while the dependent parameter is “Interpersonal Relationships among the officers in Bangladesh Armed Forces”, which essentially form the constructs. The conceptual framework showing the relation of Concepts, Constructs and Measures is given in figure below:

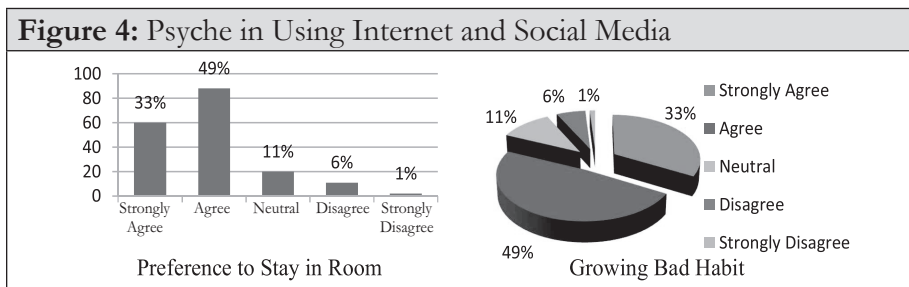


Social Media Addiction in the Armed Forces

Thinking about life without internet or social media is extremely difficult and certainly not practical. Social media not only offers positive things to mankind but also becomes the cause of many disadvantages in our lives (Anderson, 2018). Habitually many people use social media, but not too many are genuinely addicted. If someone is addicted then it is a very serious problem for the organization because the organization suffers when its member tend to use internet or social media unusually.

Perception about the Usage of Internet and Social Media

- Perception Gap.** There exists a gap between the perception and reality of internet use. In general, Armed Forces members perceive more than the reality about the rising phenomenon of the use of internet and social media. Even young officers who are thought to be spending more time using internet and social media also agree that the use of internet in the Armed Forces is on the rise.
- Current Trend.** In Armed Forces, most of the members for about 82% believe that the use of social media by officers is increasing day by day and the current trend is to get addicted. Interestingly 100% of Senior Officers think that use of social media has increased and the trend is on the rise while 90 % of mid ranking officers believe the same and as opposed to that 75% of junior officers agree with it. But the usage pattern suggests that junior officers use internet and social media more than the mid-ranking and senior officers.
- Psyche in Using the Internet and Social Media.** Most of the officers' psyche is to remain connected with internet or social media instead of going out and explore, which is increasing day by day. They are growing bad habit of using internet and social media beyond the limit, and the tendency is to overuse and ultimately get addicted. As a result, many of them find difficulties to logically allotting time and priority in daily activities, which cause extra stress on them. The majority of officers think that instead of going out to interact with others, officers mostly prefer to stay in room and browse internet (Figure 4).



Reality about the Usage of the Internet and Social Media

- **Pattern of Use.** The pattern of use suggests that about 71% officers use internet and social media almost for no good purpose rather for passing time. Alarming, about 15% use internet for 3-4 hours or more where about 25 % use it very often, 47 % use it moderately and 3% even use it extremely often. But it could also be revealed that about 33% officers lose sleep due to late-night use of internet.
- **Pattern of User.** The pattern of user indicates that junior officers are more prone to the use of internet and social media who are usually found to stay longer in the social network. Junior officers feel that life is unworthy and boring without internet or social media due to lack of maturity and too much of expectation by comparing the life outside the garrison.
- **Overuse and Time Management.** Overuse/addiction to the internet or social media has an impact on time management, quality concentration and meaningful interpersonal communication, which is likely to substantially affect the standard of the organization. About 53% of officers feel stressed for time management in daily activities due to excessive involvement in social media activities.
- **Cognitive Dimension.** Internet and social media have significant impact on the mindset of officers, especially the junior officers. About 63% of officers say that often they stay longer than they intended. Because of preoccupation, some of them even cannot disengage from internet or social media timely which ultimately gives an impression of either overuse or addiction. About 52% feel life without internet would be meaningless and 42% feel happy to use it, but surprisingly 18% feel depressed.

Interpersonal Relations: Connecting or Disconnecting

In an organization, the interpersonal relationship works as conflict resolution and increase effectivity and productivity. Indeed, the way we

can be happy for the connectivity, knowledge enrichment and professional enhancement, in the same way we can be unhappy by the negative impacts i.e. disconnecting from close people, viewing unhealthy things, and most importantly getting addicted and becoming isolated from others.

Officers Performance in Unit

The standards of units are generally getting affected by the tendency of overuse of internet and social media by unit officers. In reality, about 24 % felt that due to overuse of internet and social media, officers' commitments to unit affairs are hampered literally. The number even if not large, is enough to affect the overall performance and standard of the unit including organizational values and ethics.

Connected to Virtual Friends

Majority of the officers lack the scopes to remain well connected to their peers in the units, brigades or divisions due to remaining virtually connected with people staying far away from them. Even for official purposes or programs when they remain present physically in the units lack quality engagement. Therefore, relation is likely to be very formal which certainly affects the effective interpersonal relationship. By using the social media apps, about 37% of the officers give more time to virtual friends than colleagues.

Self-centeredness

In the Armed Forces, a substantial number of young officers are tending to suffer from the symptom of self-centeredness. Excessive use of internet and remaining involved in social network tend to make officers self-centered, which is definitely not good for the organization. About 66% believe that, for surfing internet quietly, officers mostly prefer to remain inside their rooms rather than going to officers' mess.

Socialization

Socialization an essential process of the Armed Forces which lays opportunity of interacting each other is generally affected by the trend and tendency of overuse of internet and social media by the officers. About 78% believe that officers are even remaining busy with their gadgets instead of mixing and mingling around with other colleagues and families during social programs. Physical presence does not help get better social life if individuals cannot get rid of gadgets.

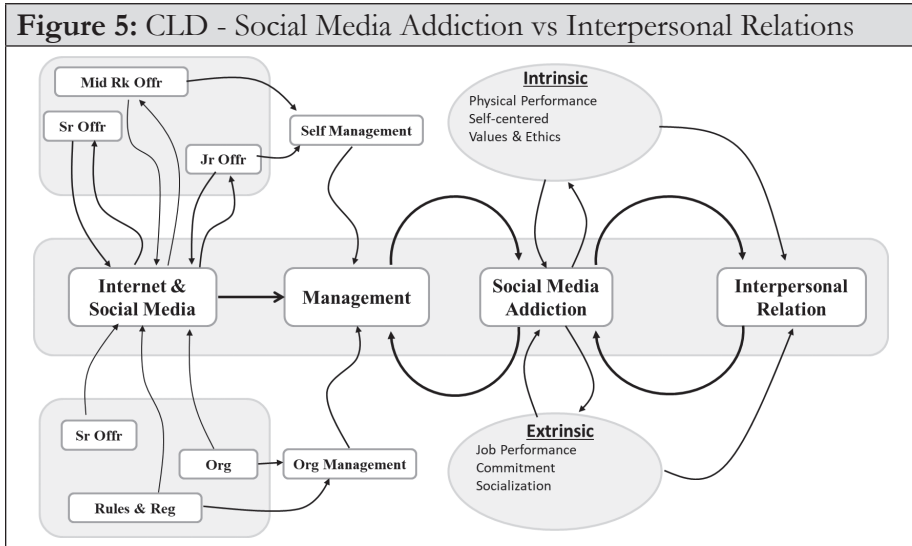
Does it Affect Interpersonal Relations?

The pros and cons of the use of internet and social media at workplace are widely debated, though many would say that the pros are more than the cons. While the use of internet is essentially required for any organization to function properly, but excessive personal use of internet by the members of the organization will affect not only the organization but also the individuals. This makes the individuals isolated and creates mental and physical gap among peers which will affect the team building within the organization. About 71% of the officers opined that excessive use of social media affects interpersonal relationship among officers.

Causal Loop Diagram (CLD)

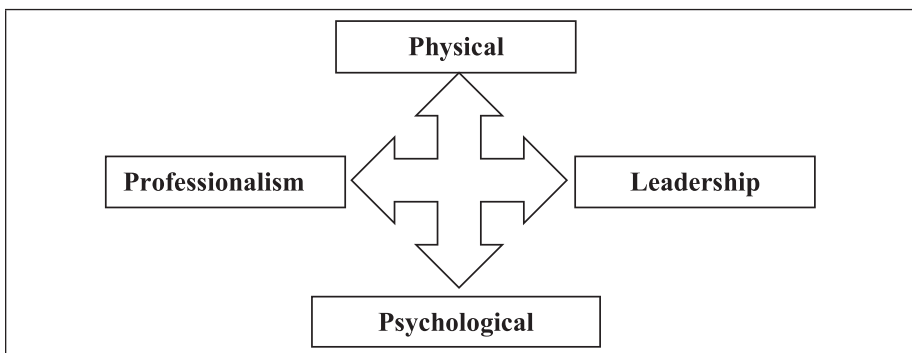
CLD analyzes the cause and effect model to find out the correlation between the ‘Social Media Addiction’ and ‘Interpersonal Relation’. Armed Forces officers are prone to use internet and social media like others in the society where such uses are supposed to be regulated by concerned authority/organization through proper rules and regulation. Senior officers also have responsibility in influencing the use of internet and social media. However, state of management of both organization and self ultimately dictates the trend of the use of internet and social media i.e. normal use or overuse/addiction. CLD also shows that social media addiction has both intrinsic

and extrinsic impact and lack of proper management is adversely affecting interpersonal relations (Figure 5).



Challenges Faced by the Armed Forces

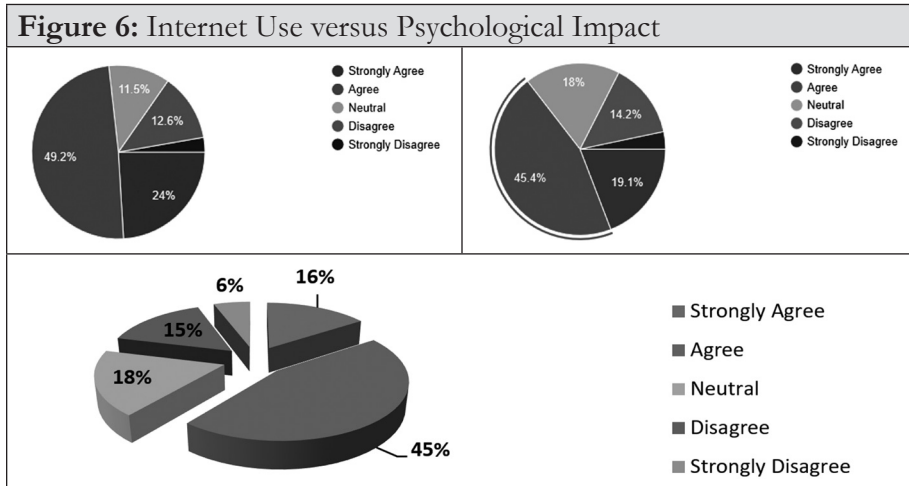
Despite numerous advantages offered by internet and social media, overuse or addiction to internet and social media causes serious impact on physical dimension, psychological dimension, professionalism and leadership arena of both the organization and individuals, which need to be overcome in order to be viable and effective.



- **Physical and Psychological Dimensions**

While social media platforms have their benefits, using them too frequently can make people feel increasingly unhappy and isolated (Addiction, 2020). It is responsible for poor physical standard and mental health, and low self-esteem. Case Study of 12 × Officers of 16 Cavalry shows how the physical standards of officers are related to the use of internet (Table 1). It also causes unusual emotional reaction, makes people unhappy, and affects individual behavior and rationality of thinking. About 73% officers believe that overuse of social media makes officers self-centered and isolate them from others. On the other hand about 75% officers think that overuse of social media causes irate behavior of officers and affects their psychology. About 61% officers believe that ethical and moral values of officers are degraded due to overuse of social media, which affect esprit-de-corps (Figure 6).

Table 1: Internet Use versus Physical Performance				
Ser	Rank	Internet Usage	Purpose	IPFT Performance
1.	Major (6-15 years)	30-40 minutes	Official/personal	Excellent
2.	Captain (3-5 years)	2-4 hours/day	Official/personal	70% passed in 1 st Chance 20% passed in 2 nd Chance 10% passed in 3 rd chance
3.	Lt (2-3 years)	1-1.5 hours/day	Official/personal	
Source: Case Study of 12 × Officers of 16 Cavalry				



- **Professionalism**

Alongside physical and psychological dimensions, overuse of internet affects the professionalism of officers. Spending more time with internet and social media causes individuals of time paucity for essential as well as routine activities of the unit/establishment/organization. Individuals, especially junior officers in the units fail to develop required ability of organizing and making prudent decision due to poor commitment and lack of initiative. Inconsistency was observed in their commitment and they do not go in depth of jobs. About 58% officers think that social media is affecting negatively the professionalism of officers.

- **Leadership**

Military traditions and values being conservative may face serious challenge ahead due to techno based social media where security of men, material and information remains under serious threat. Over reliance on technology may reshape/ challenge the leadership concepts/ theories practiced in military. A serious challenge is looming large presaging to leadership vacuum in near future where a complete new generation is likely to come up without developing interacting relations with peers or under commands. About

55% officers believe that overuse of social media by officers adversely affect leadership at the formation level.

Challenges and Ways Forward - Neighboring India

- **Trends**

Neighboring India also faces similar challenges like Bangladesh. Members of Armed Forces also cannot keep away from the technological revolution which has become national addiction and thereby became equally affected like the civilians. Indeed, social media is urgently needed for various social interactions, administrative functions and organizational improvement. The Army Chief, General Bipin Rawat said that members of Armed Forces cannot be prevented from using the social media and smart phones, so it is best to allow and educate them on the best practices (Karanbir, 2018).

- **Challenges**

The main challenges are the overuse of internet, leakage of information, becoming prey to honey-trapping and phishing etcetera. Despite strong mechanism and well laid out procedures to prevent such incidents of honey-trapping, still, there are some people to fall prey to it. “Recently, in several occasions suspicious information was being circulated on WhatsApp groups of the Armed Forces personnel. Senders of that information were identified and taken to the task. Now, everyone in the army is being under scanner for use of social media,” (Patel, 2019).

- **Measures Adopted**

The Indian Armed Forces has a very robust social media policy and there is a particular department, which is dedicated to monitor social media engagement of respective personnel. Against ‘honey trapping’ or ‘spear phishing’, Army headquarters is constantly making efforts to make its social media policy more stringent (Sagar, 2018). Strict DOs

and DON'Ts are outlined for necessary compliance. Officers are strictly prohibited from forming part of any group especially with foreigners, exposing official identity, watching porn, posting photographs in uniform etcetera. In addition, the Armed Forces regularly organize motivational sessions at different levels for the members to be aware of pros and cons of social media. The Indian Armed Forces developed own e-platform for communication and internet, which ensures safety and security of information, materials and personnel. Besides, personal gadgets are not allowed in the offices, training areas and during active patrolling or operational activities. According to the new 06 June policy, all Indian Army personnel have been ordered to delete their accounts from Facebook, Instagram and 87 other applications.

Ways Forward to Mitigate the Challenges

The use of social media platforms cannot be stopped completely, but the use can be regulated and restricted. The Bangladesh Armed Forces when faced with this unique challenge of social media, the first response was to ban its use for the soldiers and discourage for the officers. However, its popularity, advantages and usefulness seem to outweigh the disadvantages. That's why it is important to define the approach first and then develop the suggested measures.

Approach to Ways Forward

Looking at the issue critically, it is imperative to perceive the problem first and then think about how to go about it? In fact, these are all about approaches to the problem to derive plausible measures. The matter needs to be looked into holistically with 360° views. More so, the impact of the technological domain cannot be denied but striking a balance between the need versus controlled use is required to be worked out for a pragmatic, plausible and satisficing solution.

Word Cloud Analysis

Word Cloud Analysis of suggestions for ways forward asked in survey reveals that ‘motivation’ was the most referred word and other frequent words were ‘awareness’, ‘positivity’, ‘professionalism’, ‘policy’, ‘family’ etcetera. While looking at motivation, it should be viewed both from intrinsic and extrinsic point of view.

Suggested Measures

Considering the implementation, applicability and effectiveness suggested measures are grouped under three different scopes i.e. Institutional Programs, Individual Initiatives and Active Measures, which may be considered and incorporated as applicable for improving the situation in the Armed Forces.

Institutional Programs. It is always the organizational responsibility to groom, guide and monitor its members appropriately.

- **Organizational Responsibility.** The range of actions may include setting out policies, arranging appropriate training, guiding as necessary, issuing appropriate Dos and Don'ts, ensuring its implementation etcetera.
- **Grooming Young Officers.** About 85% of officers believe that mentoring/counseling/grooming up of young officers properly in the initial days of military career will help them remain regimented throughout. Commanding officers should play pivotal role for proper grooming of the newly commissioned officers and they have to be motivated on a regular basis.
- **Awareness Program.** More than 80% officers feel that creating awareness among young officers about the adverse effect of internet obsession will help improve interpersonal relationships. Therefore, respective Headquarters should take necessary steps to make the

officers aware of Social Media Policy and the usage of social media, which will guide them for appropriate actions to dealing with internet and social media.

- **Training on Ethics and Values.** About 80% officers think that formal training organized at formation level by respective services on ethics and values to the young officers will help making them respectful to social norms and help individuals to remain within acceptable limit of behavior and conduct.
- **Developing Unique Platform for Bangladesh.** Blocking all other social media apps, Bangladesh should develop its own social media apps like YouTube, Facebook, WhatsApp etcetera under direct supervision of ICT ministry. Besides, special mobile sets should be developed with approved and preinstalled essential apps designed for military use only. The facilities of Bangobondhu satellite must be utilized to develop a common Intra-net platform for official use of both civil and military having similar but separate WWW for the use of internal calling and emailing.
- **Metered and Monitored Internet System.** The use of internet and social media should not be left alone only with the individual's ethics. Uses should be metered and monitored. Adult content including any games that has nudity and violence should be totally blocked in Bangladesh internet domain.

Individual Initiatives. Individual Initiative is very important because self-help is the best help. Unless someone is willing then nobody can rectify him. That's why positive mentality should be developed first before undertaking any motivational tasks to prevent getting succumbed to the negativity of social media. Someone might even develop addiction to internet and social media without understanding. Therefore, to grow required ability in self-regulation one needs to be mentally strong, possesses positive mindset, and pay due respect to rules and regulations. In addition, power of religion should be used to control and guide individual behavior, conduct and actions

because addiction is not permitted in any religion. About 71% officers argue that motivations from religious point of view will ensure officers to refrain from the over use of internet and social media.

Active Measures. Merely an instruction of few Dos and Don'ts related to social media may not be enough. Rather, a range of actions specifically required to be undertaken to guide, direct and monitor officers and their actions related to use of social media. Indeed, everybody should understand the purpose of using internet and social media, and know the limit of using it, and thereafter make judicious use. Regular motivation is the key; therefore, headquarters at different levels should look for organizing motivational sessions at a regular interval. Besides, establishing regulatory system will ensure controlled use of social media. Efforts must be made to increase ways and means of effective interactions i.e. informal gathering on weekend/ holidays, organizing additional cultural programs, games and other interesting activities. Junior officers are to be motivated first to understand the gamut of harmonious balance between personal and professional life and then acquire the art of balancing.

Rcommendations

Media Policy should be reviewed periodically to address the latest changes in the context of technological advancement, which should be aimed at reducing associated risks. Discussion between junior and senior ranks on social media should be facilitated to help develop guidelines and best practices.

Young Officers should be mentored/counseled/groomed up properly in the initial days of their military career, which will help them remaining regimented throughout. Commanding officers should play a pivotal role for proper grooming of the newly commissioned officers.

Awareness programs at different tiers should be organized to help raise general consciousness of safe and ethical use of social media, and help the officers to learn and remain aware of the controlled use of social media.

A training curriculum on 'Optimum Usage of Internet and its Security Aspects' may be formulated for all, which needs to be regularly updated using recent case studies. Young generations should be educated about the ICT and its significance in today's perspective.

Mechanism of monitoring the activities of social media in the Armed Forces may be established to develop more responsive and flexible management models. An outfit at Army level and a supervisory board at formation level may be established to ensure strict compliance of the directives, instructions and policies in vogue regarding the use of social media.

Under direct supervision of ICT ministry, unique internet and social media platform may be developed for Bangladesh to facilitate its own dedicated website and social media apps like WhatsApp/ YouTube/ Facebook for the Armed Forces and a common Intra-net platform for official use of both civil and military by using Bangobondhu satellite.

Conclusion

In the era of technological advancement, thinking about life without social media is extremely difficult. But, it is to be realized that social media not only offers positive things to mankind but also causes many disadvantages. Coming from the same society, officers of the Armed Forces are also equally sufferer from the overuse of social media. Generally, the trend of using the internet and social media is found to be on the rise. Indeed, tendency is to overuse and ultimately get addicted where majority officers are found using internet to pass time only. Besides, junior officers were found using internet more than the senior officers. If the officers become heavily dependent on social media or become addicted then it will have a negative impact on interpersonal relationship among officers posing serious leadership challenges. Therefore, it becomes obligatory to look for three-pronged plausible and satisficing solutions i.e. Institutional Programs, Individual Initiatives and Active Measures.

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THE UNITED NATIONS PEACE OPERATIONS: OPPORTUNITIES FOR BANGLADESH

Brigadier General Md Aftab Hossain, BSP, ndc, afwc, psc

Introduction

United Nations Peace Operations (UNPOs) are considered to be the most effective tools for establishing peace and stability in the world. In last 72 years, United Nations (UN) has conducted 71 UNPOs around the globe and has confronted with evolving challenges as the nature of conflict around the world has gradually changed (UN Background Note, 2020). With the end of Cold War era, the strategic context of peacekeeping drastically has changed and the UNPOs have transformed from ‘traditional’ peacekeeping involving only military tasks to complex ‘multidimensional’ peacekeeping that involves different stakeholders in addition to military and police (Coning, C, d. & Peter, M. 2019). According to the constitution, Bangladesh is committed to maintain international peace and stability. She has started contributing in the UN missions since 1988 and in next 32 years has emerged as one of the leading Troops/Police Contributing Countries (T/PCCs). However, she is now facing multifaceted and multi-dimensional challenges to enhance contribution due to evolving nature of the UNPOs despite having potentials and three decades of experience in peacekeeping. The recent trend shows that numbers of troops/police contribution from Bangladesh is shrinking and in last 10 years (from 2010 to 2020) it is reduced by about 40% (UN Archive, 2020).

After the Cold War era the context of the UNPOs have changed and the UN missions have focused on peacebuilding activities to strengthen the capacity of the war-torn nations (HIPPO Report, 2015). But it seems that Bangladesh remains focused mostly on peacekeeping operations with a lenient approach to other element of the UNPOs especially in

peacebuilding activities. As a result, Bangladesh is yet to explore other opportunities offered by the multidimensional UN missions and returned home right after termination of peacekeeping phase. For example, despite being the largest contributors in Sierra Leone, Bangladesh could not extend her peacebuilding effort and returned to Bangladesh by 2007, whereas some nations continued with peacebuilding activities until 2014. Repetitions were also observed in case of the UN mission in Liberia, Ivory Coast, Sudan and Darfur. At this backdrop, this research aims to study how to enhance her role by exploring the opportunities offered by evolving nature of the UNPOs in present day's context.

Literature Review

A plethora of literature on the UNPOs originated from the organisations and institutions work for global peace such as UN, International Peace Institute (IPI), Norwegian Institute of International Affairs (NUPI), and Centre on International Cooperation (CIC) etc. were reviewed to crystallize the idea and broaden the horizon of knowledge. The legendary reports like 'An Agenda for Peace (1992)', Brahimi Report (2000), HIPPO Report (2015) and Cruz Report (2017) about management, conduct and improving security of the UN personnel are also reviewed. The End of Assignment Reports of the Force Commanders and experts were analysed too. The research of academicians and practitioners of Bangladesh Armed Forces/ Police have been given due importance in addition to those mentioned above. The literature review focused on changing nature of conflicts, changing trend of the UNPOs, involvement of regional organisations and other stakeholders, modus operandi peacebuilding activities etc. Literature on challenges and complexities of the UNPOs viz-a-viz preparation of Bangladesh to overcome those challenges were also reviewed.

Research Gap. There is hardly any mention about the salient opportunities that the UNPOs have brought for the developing countries in contributing more peacekeepers which is the focus of this research. Though the literatures have encompassed many challenges of the UNPOs but those

are generic in nature from global perspective and not specific to any T/PCCs or Bangladesh. This research attempted to cover the gaps by identifying the opportunities of Bangladesh based on her potentialities, investigating the challenges and analysing the prerequisite preparation needed by Bangladesh to overcome those challenges arising from evolving nature of the UNPOs.

Research Methodology

This is a qualitative research and the methodology of the study consists of an analytical framework. The focus was to collect data on the evolution, trends, characteristics and challenges of the UNPOs which was sifted, analysed and deduced to arrive at conclusive remarks and recommendations. The study comprised of analysis of the primary and secondary data. The sources of primary data were Key Informant Interviews, Focus Group Discussions (FGDs), UN Secretary Generals' Report and other official reports, End of Assignment Reports of different UN leadership etc. The secondary sources of data were books, journals, other researcher, statistics collected from different stakeholders and websites etc. A substantial source of information was from several years' personal experiences of the researcher on the UNPOs for his service as staff at the UN Secretariat and Army Headquarters, Bangladesh. However, the personal understanding and views were validated through interviews, discussions and comparison of notes. In-depth interviews were conducted and the information as provided by the interviewees are interpreted neutrally. One of the limitations of this research was conducting interviews of the overseas respondents although were communicated by emails.

Evolving Nature of The UNPOs and Change of Actors

Evolution of the UNPOs. In last 72 years, the UN peacekeeping efforts have come across many turns and twists due to the variation of global power, dramatic changes in nature of conflict, rise of non-state actors and involvement of the regional organisations (Cliffe & Novosseloff, 2017).

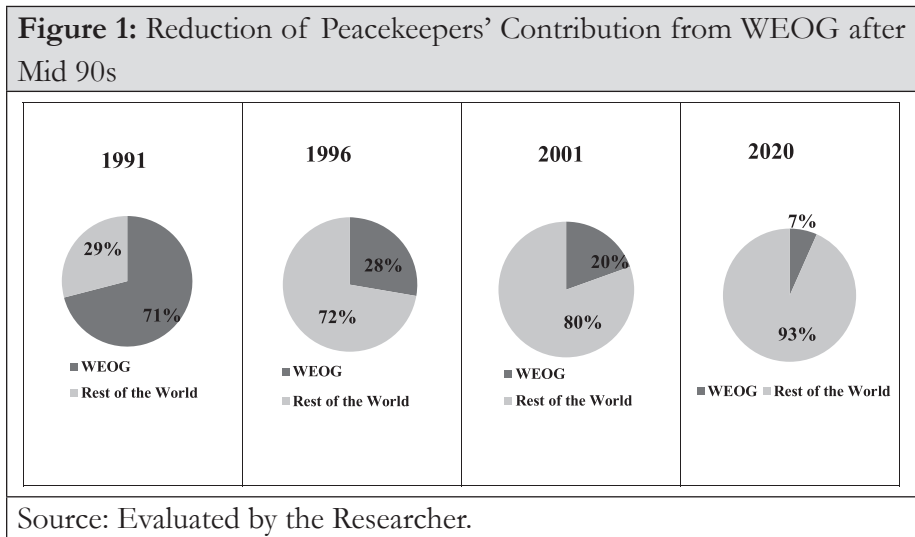
By and large, in last six decades, the UNPOs have had many successes of providing the essential security and support to millions of people but not without the failure of mid-90s in Rwanda, Somalia and Bosnia (Ahmed, 2014). 72 years experience shows that the trend of the modern UNPOs have transformed from ‘traditional peacekeeping’ to ‘multidimensional peacekeeping’ for capacity building of the war-torn nations (Smidt, 2019). The changing pattern of conflict, changing great powers relations, peacekeeping by regional arrangement under the UN Charter VIII etc. are affecting UN peace effort. Though the situation is offering opportunities for developing countries like Bangladesh but are inviting challenges and affecting scopes of contribution by the leading T/PCCs. However, due to increased terrorist attacks, organised crime and other asymmetric threats, the rate of casualties of the UN peacekeepers has increased significantly in recent years.

Changing Trends in UNPSOs: Traditional to Multidimensional and Increased Peacebuilding Tasks. The UNPOs were debut in 1948 and in last 72 years, total 71 UN missions were commissioned, of which 13 missions are now ongoing. To keep pace with the rapidly changing security environment, the UNPOs are changing their trend. Analyzing the journey of six decade, the most notable trend identified is transformation of the UNPOs from merely monitoring and reporting ‘Traditional’ missions to complex ‘Multidimensional’ missions. It was initiated through the then Secretary-General Boutros-Ghali’s ‘An Agenda for Peace 1992’ report. The most significant contribution of the report to the modern understanding of peace which introduced the concept of post-conflict peacebuilding. It is required to support the structure to strengthen and solidify peace in order to avoid a relapse into conflict again. However, over last 72 years, peacekeeping has faced several challenges at strategic level due to the absence of political solutions, improper priorities, lack of commitment of all the stakeholders etc. To respond against those challenges, UNSG António Guterres has launched the A4P initiative in March 2018 for ‘Collective Action to Improve UN Peacekeeping Operations’ (UN, 2020). Both ‘An Agenda for Peace’, and ‘Action for peacekeeping’ initiative focused on

peacebuilding activities and partnership of the UN, host countries, troops contributors, finance contributors and other stakeholders.

Change in Actors

Decline of Western European and Others Group (WEOG) from Troops Contribution. Setback of the UNPOs in the mid-1990s in Rwanda, Somalia and Bosnia-Herzegovina brought about stillness in the UN peacekeeping. The developed countries declined to contribute troops to the UNPOs since then, though they maintained their representation through leaderships, staffs and observers. In 1991 western countries provided 71% of the total peacekeepers but at present provide only 7% (Global Peace Operations Review, 2016). The vacuum created by the developed countries were quickly filled up by the developing countries from Asia and Africa. Gradual declination of WEOG in contributing peacekeepers to the UNPOs for last 30 year is shown in Figure 1.



Increase in Troops Contribution by Global South. Following the declination of developed/Western countries, the developing countries of Africa, Asia, and South America started providing troops for the

UNPOs from the Mid 90s. At present, T/PCCs of commonly known as Global South provide around 91 % of all uniformed peacekeepers of the UNPOs whereas their financial contribution is only about 15% (Thomas & Goivanna, 2019).

Potential Areas of The UNPOs and Opportunities for Bangladesh

Potentiality of Bangladesh for the UN Peace Effort in Different Sectors

The changing trend of the UN peacekeeping from traditional to multidimensional is offering opportunities that can be utilised by one of the largest TCCs – Bangladesh – with her huge potentialities in different fields and treasured experience in contributing to the UNPOs for last three decades. In addition, Bangladesh has the experiences of frequent deployment ‘In Aid to Civil Power’, pacification activities in Chattagram Hill Tracts, preparation of electoral roll, disaster management and humanitarian assistance etc. Therefore, Bangladeshi peacekeepers are likely to perform much better in the peacebuilding activities (Interview, 2020). Bangladesh also has significant experiences of performing the role of establishing peace in Sierra Leone, Liberia, Ivory Coast and other missions which would also be instrumental in performing better for peacebuilding activities in other multidimensional missions. The peacebuilding/peacekeeping tasks and the potential participants are shown in Table 1.

Table 1: Tasks and Potential Participants of Bangladesh	
Tasks/Sectors	Potential Peacebuilders / Participants of Bangladesh
1. Security Sector Reform.	a. Armed Forces personnel
2. DDR of Ex Combatant.	b. Police personnel: Prison Police, Correction Officer (Former Peacekeepers).
3. Clearance of Mine Action.	c. Ammunition/explosive technicians of different agencies.
	d. Administration personnel and Correction Officers.
4. Establishing Rules of Law.	a. Police and Armed Forces personnel
5. Electoral Assistance.	b. Election Commission personnel.
6. Support to the restoration and execution of States Authority.	c. Judiciary and Legal Experts
7. Extending State authority and assisting transition to stable government.	d. Public Administration Officer.
	e. Personnel worked for preparation of electoral roll in 2008 in Bangladesh (data entry operators, software/hardware providers).
8. Restoration of Basic Service (water supply, sanitation, reconstruction).	a. Engineers.
9. Infrastructural Development like construction of roads, bridges, buildings etc.	b. Experts from different utility services like water, electricity etc.
	c. Sanitation and cleaning workers and volunteers.
	d. Skilled labourers.
10. Socio-economic development Project.	a. NGOs (like BRAC, ASA, Grameen Bank etc.).
	b. Concern department of Bangladesh.
11. Employment of opportunities for Bangladeshi nationals in the UN system.	a. All eligible persons (Female and Male).
	b. University students (for Internship Programmes).
Note: For the UNPOs under the UN umbrella, only serving personnel need to be employed. However, for bilateral cooperation both serving and retired personnel of different sectors may be employed.	
Source: Evaluated by the Researcher (the comments/suggestions of different Interviewers are also considered).	

Likely Opportunities for Bangladesh

Considering the demand of peacebuilding tasks, it can be assumed that the Bangladeshi peacekeepers can support in almost all the sectors based on the previous experiences both at home and abroad. However, some of the sectors need special attention for its importance and sensitivity that are described in subsequent paragraphs.

Security Sector Reform (SSR) Support. SSR is very essential for the countries recovering from conflict or making transition from authoritarianism, fragility or collapse. SSR is considered as the mainstay in state-building policy and practice. Bangladesh Armed Forces and Police both can perform better provided they are employed during peacebuilding (Bhuyan, 2013). SSR process can continue even after completion of missions under government to government arrangement (Interview, 2020). Bangladesh needs to pay more attention in this sector in future.

Electoral Assistance. UN electoral assistance is provided only at the specific request of the Member State concerned, or based on a mandate from the UNSC and General Assembly. In all circumstances, DPPA handle the issues of electoral assistance. The UN provides assistance in the form of technical assistance, election monitoring, organizing and supervising of election etc. Since 1991, the UN has provided electoral assistance to more than one hundred countries, and the demand is increasing day by day. Besides providing support for conducting elections, Bangladesh Armed Forces has experience of preparing electoral roll in 2008 along with Election Commission with the financial support of UNDP. This is a unique potentiality of Bangladesh, which can be instrumental in gaining confidence of the UN to participate in the UN assisted electoral process. It may be materialised with a team comprised of civilian and uniform personnel. However, diplomatic venture as a part of the overall effort, convincing the UN and local stakeholders about the efficacy of the model should be the first step in this regard (Interview, 2020).

Participation of Women in the UNPOs. Mandated tasks of the UN missions demand involvement of more female and without participation

of sufficient women that makes it “virtually impossible” (Interview, 2020). At present 16.7% of female officers (UNMOs, SOs and Others) and 4.7% contingent members (troops) are deployed in the UNPOs (SG Report, 2019). The roadmap of DPO targeted to deploy 25% officers and 15% contingent members by 2028 (Chief of Defence Conference, 2019). It clearly indicates that there are huge opportunities for deploying more female in the UNPOs. Bangladesh has 4.3% female in military/police contingents and yet to meet the demanded percentage.

Socio-economic Development of Host Nations and Possible Involvement of NGOs from Bangladesh. NGOs can further contribute to return, resettlement, reintegration and rehabilitation of IDPs and refugees. According to BRAC (the largest NGO of the world), programmes may include provision of social services such as agriculture, education, health, and social welfare; and enhancing economic growth and development through financial inclusion, skills development, and employment generation. BRAC has experience of working in rural areas of Afghanistan for over 30 years in conflict-prone and post-disaster settings (Interview, 2020). Such programmes and initiatives can be replicated in the field of socio-economic development of other interested countries where Bangladesh has participated in the UNPOs.

Probable Fields of Bilateral Cooperation beyond the UN Peacekeeping

Importance of Bilateral Cooperation. Peacebuilding activities focus on the fields which are necessary for state building of the war-torn nations and for this reason, the peacebuilding activities are set based on the priority as needed by the host nations and it continues for long time. Therefore, it has been observed that in addition to the UN and regional organisations the host countries’ preference play a vital role in selecting T/PCCs especially for peacebuilding phase of the UN peace process which normally takes place after peacekeeping phase. The positive image created by Bangladeshi peacekeepers offer some opportunities of establishing and

extending bilateral relation beyond peacekeeping missions. Enhancing bilateral cooperation is of paramount importance and an all-encompassing relationship with the host countries is expected (Interview, 2020). Bilateral relationship should not be seen through myopic conflict prism but must be seen as an investment for the future (Interview, 2020).

Fields of Bilateral Cooperation. Every country is unique with its own characteristics, resource, foreign policy and other associated issues of bilateral cooperation. However, some of the common probable fields of bilateral cooperation is military to military training cooperation which may be implemented by offering to attend training activities in Bangladesh including higher level of training at National Defence College and Defence Services Command and Staff College. Once initial cooperation starts, Bangladesh being agro-based economy, the cooperation may further extend the field of agriculture and other sectors with mutual interest between two countries. Furthermore, the scopes for trade and commerce can also be explored based on the positive image created by Bangladeshi peacekeepers. It may be mentioned that African war-torn countries need different day-to-day commodities, agricultural instruments, construction materials etc. Bangladesh business communities opined that it has potentialities in sectors like food, fast-moving consumer goods, health and sanitisation and garment industries. African region can be a prospective field for agro-based product also from Bangladesh.

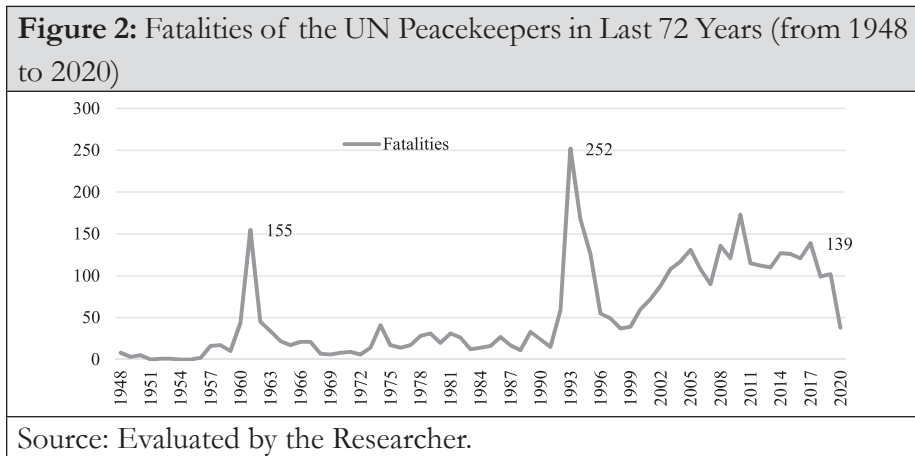
Challenges of Bangladesh for Enhancing Contribution in The UNPOs

The UN encounters number of challenges to implement its agenda especially conduct of the UNPOs as it is depended on member states for both force and fund of the UN peacekeeping. Due to the current change in global order, peacekeeping is encountering new challenges. At one side the UN is weakening its impartial image and struggling with budgetary issues, on the other hand peacekeepers are encountering multi-faceted challenges on ground. Complexity of command and control system also sometimes

pose difficulties in employing the force as the UN leaderships have only tactical control but not the full command. Side-by-side, Bangladesh is also facing multidimensional challenges in maintaining her leading position by effective contribution to the UNPOs. Bangladeshi contingents are mostly deployed in land lock countries of African region - far away from home. To maintain about 27 contingents with heavy equipment and thousands of troops is a major logistic challenge. However, in persuading her national interest, to keep the tempo on and to maintain the already created positive image, Bangladesh should now respond effectively to UN's requirement. The most significant challenges Bangladesh is facing are as follows:

Hostile Operational Environment and Increased Fatalities

On-going UNPOs are inviting serious security challenges including terrorist attack and asymmetric threat for the peacekeepers (Karlsrud, 2018). In addition, persistent 'Improved Explosive Devices (IEDs)' threat highly restricts the freedom of movement of the UN forces in Mali. Contingents are often tasked to conduct operation beyond mandated parameters which is a serious concern also. Alongside the UN Forces, there are troops from other regional organisations like AU, G5 Sahel Force and Forces from other nations (UN Peacekeeping, 2020). Due to increased terrorist attacks, organised crime and other asymmetric threats, the rate of casualties of the UN peacekeepers has increased significantly in recent years as shown in Figure 2.

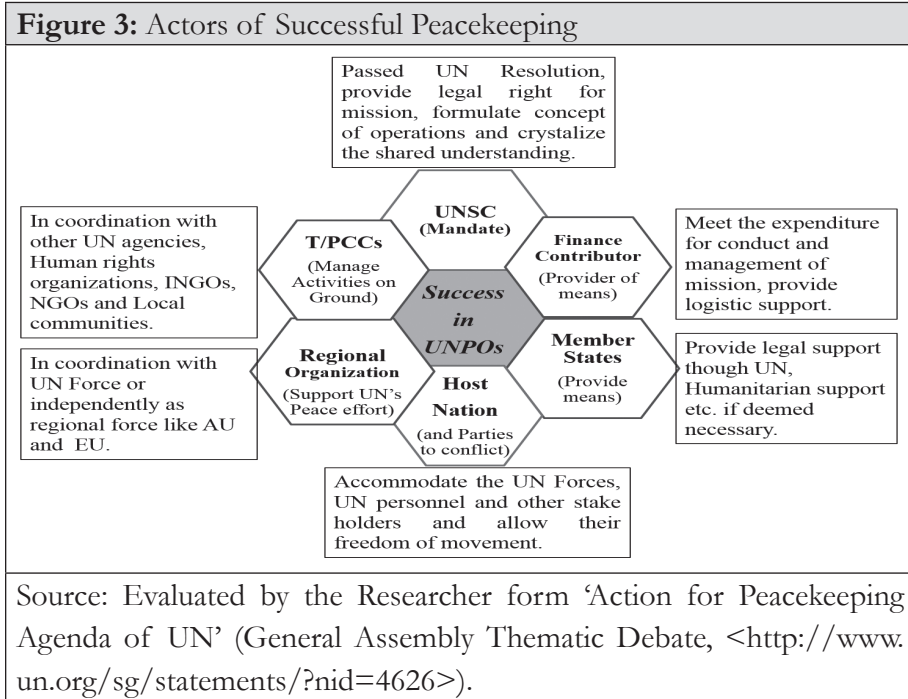


Language Barrier. Bangladeshi peacekeepers are really struggling to acquire skills on local languages as most of the countries hosting the UN missions (Mali, Central African Republic, Democratic Republic of Congo, and South Sudan) that are French or Arabic speaking. Though the skills of Bangladeshi officers' in English is good, but the levels of communication of both officers and troops lack in French and Arabic. Due to the lack of skills in French language, Bangladeshi candidates sometimes do not get shortlisted/ selected for posts in the UN secretariat and field missions. In addition, around 6456 personnel are participating in 'Operation Kuwait Punorgothon' (OKP) that also demands skills in Arabic language. There are growing demand from Saudi Arabia, Oman, Qatar, and other Middle East countries where skills on Arabic is required.

Responses of Bangladesh

Strategy of Bangladesh to Participate in the UNPOs

More Initiative in Shared Responsibilities. The UNPOs are widely accepted vehicle for world peace and security where the different stakeholders take shared responsibilities. Bangladesh needs to understand the complex phenomena involved in the contemporary UNPOs for seeking the shared responsibilities along with other partners in order to achieve peacekeeping excellence. Hence, Bangladesh, as one of the leading T/PCCs should take initiative to share her part of the responsibilities spontaneously. Figure 3 shows the different stakeholders who shared responsibilities of the successful UN peace efforts.



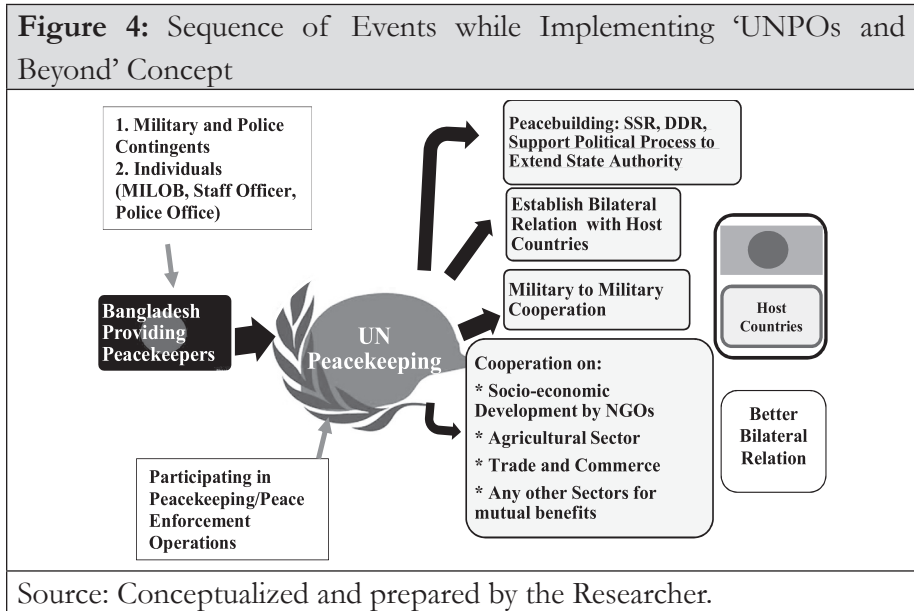
Approach to Participation in the UNPOs. 32 years of experiences in the UNPOs, vast experiences in nation building activities including partition in Chittagram Hill tracts peace accord and managing the Rohingya people are the main strengths of Bangladesh to contribute more in the UNPOs. Therefore, Bangladesh should have three-pronged approach; firstly, as part of mandated tasks, Bangladeshi peacekeepers should gain confidence of the political leaders and hierarchy of the host nations. Secondly, beyond mandated tasks, Bangladeshi peacekeepers should conduct different health/medication camps, humanitarian activities, socio-economic development programmes, organising games and competition among the locals which would take Bangladesh close to the heart of the people of host countries. Alongside, construction and renovation of roads, culverts, schools, and religious institutions should continue. Thirdly, the positive image should be utilised to establish bilateral relations with the host countries which should continue even after the termination of the UN missions.

Preparation at Strategic Level

It has to be remembered that peacekeeping is not a military issue rather deployment of peacekeepers is the reflection of Bangladesh's foreign policy. Therefore, for enhancing contribution in the UNPOs and other fields, formulation of appropriate policy at national level is very essential. MOFA should enhance diplomatic capacity by establishing embassies in different countries of Africa Region. Bangladesh should pursue higher level posts in the UN system both at the secretariat and field missions (Interview, 2020). Besides conducting training, the premier institutions like BIPSOT and Bangladesh Peacebuilding Centre should continue organizing international seminar, workshop, dialogues and exercises on international peace initiative. Bangladesh should emphasise at strategic level preparation to overcome the identified weaknesses which in turn will support different departments to overcome the upcoming challenges.

Embracing 'Peacekeeping and Beyond' Concept - Persuasion of Peacebuilding Effort and Bilateral Relation with Host Countries.

In last three decades, Bangladesh has earned credible position around the world especially in Africa region for contributing in world peace and security. But, footprint of Bangladesh is fading away due to the absence of bilateral relations with those countries which should be pursued to reap benefit through mutual cooperation. Therefore, Bangladesh should embrace the concept to continue more with government to government bilateral cooperation during and even after termination of the UN missions utilising the created positive image of her peacekeepers. The Figure 4 shows the idea of 'UNSOs and Beyond' Concept and fields of cooperation which should be pursued.



Preparation to Meet the Operational Challenges

Peacekeeping today is a complex affair that requires adaptive and capable forces to meet the challenges (Interview, 2020). Alongside training the peacekeepers and equipping the contingents, logistics, equipment, and technology should be priority while preparing the contingents as the flexible, mobile, and tech-savvy peacekeeping will increasingly come to dominate future peacekeeping missions (Zaman & Biswas, 2019). Bangladesh needs to gain skills of French language as most of the missions are now in francophone countries (Rasul, 2011). The paradigm shift of the UNPOs from traditional to multidimensional necessitates a radical change in the mind-set of the peacekeepers as well. The Bangladeshi peacekeepers need to come out of ‘Chapter VI’ mind-set as current missions are mostly peace enforcement operations under Chapter VII of the UN charter (Interview, 2020). They should be prudent enough to utilise their right of ‘Use of Force’ for self-defence and defence of the UN mandate, but must not be a ‘trigger-happy’ Force following the dictum of our foreign policy ‘friendship to all and malice to none’.

Recommendations

In light of the aforementioned discussion and the findings brought thereafter, few recommendations are as follows:

- **Formulation of National Policy for the UNPOs.** A 'National Policy' on the UNPOs may be formulated to enhance contribution of Bangladesh to world peace and security with a view to strengthen Bangladesh's international profile.
- **Establishing More Diplomatic Missions by MOFA.** To peruse national interest, MOFA should open new consulates/embassies in different countries of Africa with the current and the closed UN missions.
- **Persuading for Higher Posts in the UN System.** Bangladesh should enhance diplomatic approach for securing posts at the hierarchy of the UN system in UN secretariat and in field missions.
- **Persuasion of Bilateral Relation and Trade and Commerce.** Utilizing the positive image, Bangladesh should establish bilateral relation with host countries.
- **Modernisation of Contingents/ Peacekeepers.** Bangladeshi peacekeepers should be equipped with equipment and communication gadgets.
- **Learning at Least One of the UN Languages.** Learning French and Arabic languages should get top priority for peacekeepers/ peacebuilders.

Conclusion

The roadmap of Bangladesh for a deep engagement with the global peace is firmly pronounced in her constitution. Since 1988, in last 32 years by participating in 54 UN missions to 40 countries, she has emerged as a

leading T/PCCs of UN. At present Bangladesh is the 2nd largest T/PCCs among 122 countries with 6,543 peacekeepers which is about 8.01 % of total globally deployed UN Force. Bangladesh has glorious success and positive image in the UNPOs which in turn have facilitated and enabled her to build up diplomatic relationship with different countries and organisations. However, Bangladesh is experiencing gradual reduction of her troops contribution to the UNPOs and it is reduced by about 40% in last 10 years, which has become a major concern for Bangladesh. However, in the present days the UN missions are focusing on peacebuilding activities and with her huge potentialities, Bangladesh should be able to prudently utilise those opportunities.

Since the independence, Bangladesh has achieved laurels in many fields of which her role in the UNPOs are noteworthy. The image created by Bangladeshi peacekeepers in the field of world peace and stability has enormous contribution for strengthening, the Bangladesh's profile in the international environment which has multifaceted positive impacts on the development of the country. Every effort should be made by all relevant departments so that the hard-earned reputation is upheld, and focus is more on qualitative representation and contribution to reap dividend from the UNPOs. For this, Bangladesh should have national policy and appropriate strategy in addition to adequate preparation to face the challenges of hostile operational environment in the field. Bangladesh should also embrace 'Peacekeeping and Beyond' concept to enhance bilateral and regional corporations which would be supportive for the envisioned development plan of Bangladesh.

End Notes

1. *The term United Nations Peace Operations (UNPOs) encompasses all the activities undertaken for implementing UN peace process, but for this research it especially refers to peacekeeping and peacebuilding activities for sustainable peace of the war-torn nations.*

2. *WEOG is one of the five UN's regional groups which composed of 28 Member States from Western Europe, Oceania, North America, and Western Asia. USA is not formally a member of any regional group, but is considered to be a member of WEOG for electoral purposes.*
3. *Global South refers to the countries of Africa, Latin America and developing countries of Asia including the Middle East. It also includes Brazil, India, China and Indonesia. Japan is not included in Global South.*
4. *Bangladesh Rural Advancement Committee (BRAC) was established in 1972 which is an international development organisation based in Bangladesh. It is the number one non-government development organisation in the world, ranked by NGO Advisor - an independent Geneva-based media organisation.*
5. *'Peacekeeping and Beyond' is a concept thought of by the Researcher to enhance bilateral relations with those host countries where Bangladesh has participated and created positive image.*

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ADAPTATION TO CLIMATE CHANGE: AN ANALYSIS OF STRATEGIES TAKEN TO ADDRESS THE ADVERSE EFFECTS OF CLIMATE CHANGE IN BANGLADESH

Additional Secretary Khorsheda Yasmeen, ndc

Introduction

Climate Change can be stated as the alteration in the Earth's global climate or regional climates that happened for a long time. It is well known that the geographical location of Bangladesh has made this country one of the greatest vulnerable countries in the globe to climatic variation. It is a low heightened, coastal state in South Asia and about 80 percent of the land is placed on the deltas and floodplains of the Ganges, the Brahmaputra, and the Meghna (GBM) rivers. Bangladesh has been experienced more than 200 types of climate-related disasters like cyclones, floods, heavy rainfall, drought and extreme temperature. The consequences of these events have been affected by killing of large number of people, destroying living places, livestock, plants and occupations, which cost billions of dollar in damages almost every year (Asia Foundation, 2012). As the adaptation history of the people of Bangladesh is not a new phenomenon rather it has a long historical inherent quality that they carry on since the civilization flourished in this area. The Intergovernmental Panel on Climate Change (IPCC, 2014) stated adaptation as: "the process of adjustment to actual or expected climate and its effects. In human systems, adaptation seeks to moderate or avoid harm or exploit beneficial opportunities".

Paris Agreement emphasized more on adaptation issues and countries are to report on their alteration actions which have also been focused. As the long-term goal of Paris agreement is to keep the increase in global average temperature to well below 2°C above pre-industrial levels; and to pursue efforts to limit the increase to 1.5 °C. It may be mentioned that prior to this

agreement, the Government of Bangladesh (GoB) and the international development partners have given due emphasis on strengthening human resources to adapt to climate change.

As there is a very little (0.36 percent) influence of Bangladesh to climatic variation but due to huge emission of greenhouse gases by the industrialized nations, this country has become the worst victim. The Government of Bangladesh has already undertaken many adaptation activities to address different sectors like agriculture, forestry, health, water and infrastructure. So far many strategic policies have been formulated and a huge number of projects, programs have also been implemented by the utilization of local and international resources. This study has described the types of adaptive strategies taken in terms of policies, programmes and monetary flows, their prospects and the challenges. Based on existing research and a little on the primary data, this research paper is prepared.

Review of Literatures

Ahmed, N. et al (2019) in a report titled “Assess the Monitoring, Evaluation Procedure of BCCT and the Impact Assessment of CCTF Projects” stated that 27 projects with the fund received from Bangladesh Climate Change Trust (BCCT) were evaluated. The study analyzed the concerned policies, acts and rules, also critically evaluated the projects. Especially, it pointed out some bottlenecks which were found during the implementation of projects and provided some recommendations accordingly.

Mozumder, M. et al (2018) reviewed on adaptation options in “Response to Climate Change: Bangladesh Perspective” to address coastal inundation. Based on adaptation approaches how Bangladesh applied different mechanisms like protection, accommodation and retreat to make people resilient have been elaborated.

Khan, M. (2012) stated on “A Climate Change Adaptation Strategy for Bangladesh-2050” in terms of strengthening the institutional capacity of government to face the adaptation strategy. The report projected a future

trend of climate change up to 2050 by reviewing the historical pattern of climate change.

By reviewing literatures, it can be said that there is very few literature existed which specifically highlighted on the recent research on the adaptation strategy. The trends of effectiveness or any challenge which hampers the success of the strategies need to be examined; this study gives a direction highlighting the need of in-depth study on the vulnerable areas of Bangladesh.

Methodology of the Study

The following methods are applied:

- Literatures on climate change issues and programming especially for adaptation perspective in Bangladesh have been reviewed;
- Policy documents, relevant publications and unpublished papers on climatic variation and programming in Bangladesh have been reviewed;
- Key Informant Interview (KII) from the Ministry of Environment, Forest and Climate Change (MoEFCC), Bangladesh Climate Change Trust (BCCT), Department of Environment (DoE), Department of Forest (DoF) and Palli Karma Sahayak Foundation (PKSF) have been taken into consideration.

Climate Change and Vulnerability of Bangladesh

Defining Climate Change and its Effects

Climate is simply a weather pattern that prevails in a certain region; it highlights the temperature, precipitation and wind directions.

The influencing factors of climate are mainly the global atmosphere, sea currents, tree coverage and temperatures, which cause the local weather.

However, the human induced greenhouse effect, which mainly comes from burning of fossil fuels and the addition of Chlorofluorocarbons (CFCs) gases affect the natural system in the atmosphere. From the few decades the dimension of climate change has become more concern to the scientists because of emission through human activities are identified as responsible for this climatic change globally. More industrial processes create huge pollution and lavish lifestyles are directly effecting the climatic variables of the earth. A group of gases like Carbon Dioxide (CO₂), Methane (CH₄), Tropospheric ozone (O₃), Nitrous Oxide (N₂O), Chlorofluorocarbons (CFCs) and water vapour called as greenhouse gases in the atmosphere block this infrared radiation from escaping directly from the surface to space (Williams 2002).

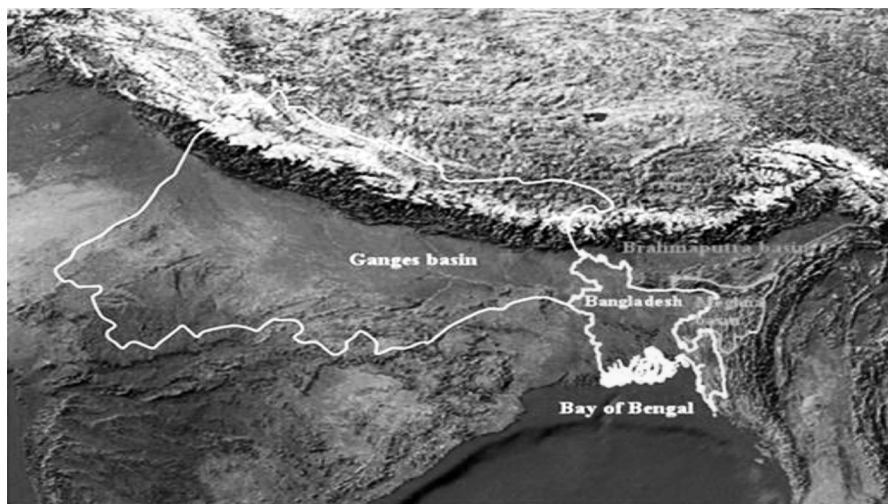
These gases act as a blanket and trap some of the infrared radiation making the Earth warmer.

As prediction indicates that by the year 2100, global temperature may rise between 1.8° C and 4 °C in average, even though it could also be possible as high as 6.4° C (Pender, 2008).

Vulnerability of Bangladesh to Climate Change

This country is mainly located on the deltas and floodplains of the three principal rivers named the Ganges, the Brahmaputra, and the Meghna (GBM). A number of hydrological, geological, social and economic factors are responsible to expose Bangladesh to high susceptibility to climatic variation (Ahmed, 2006). The high size and density of population (1200 per sq.km) put the country at risk of the societal exposure to climate change. The climatic characteristics of Bangladesh such as high temperatures, heavy rainfall, high humidity, and fairly marked seasonal variations make the country more prone to the natural disasters. It has been ranked 7th in Global Climate Risk Index 2020, as the most vulnerable country around the world to climate change (TBS, 2019).

Map 1: Location of Bangladesh in the GBM Basins



About 80 percent land of Bangladesh is a floodplain, and only elevations in the northwest exceed 30 metres above mean sea level. All three river systems originate outside Bangladesh. Almost 57 are trans-boundary Rivers out of 230 rivers in the country and Bangladesh is situated at its lowest points. The IPCC (2005) predicted that in case of sea level rise of 1 meter, 21% of the country will go under salt water. Thus, the agriculture, mangroves, flora-fauna, biodiversity and ecosystems of the coastal region and the flood plain area are under risk. The agro based economy of this country mostly depend on climatic variables and others prime needs of the population are directly or indirectly linked with the agricultural output. There will be a severe negative impact on food and water security which ultimately affects the national security

Impacts on Significant Sectors and Areas

Agriculture and Food Security

Crops are highly affected by the frequent occurrence of floods, droughts, cyclonic storms and associated storm surges. Every year about 22-30% of the country is generally flooded. Two-thirds or more of the country may inundate by a major flood event; for example, about 70% of the country

was inundated in 1998 flood. Droughts of different magnitudes also affect three to four million hectares of crop land almost every year.

Migration and Displacement

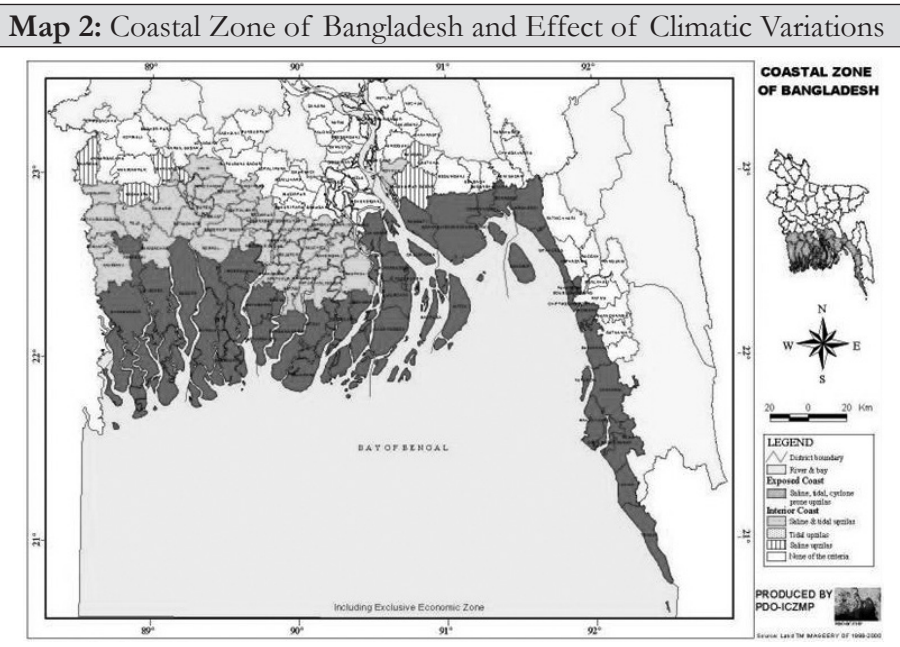
Due to the adverse effect of climate change in different location of the country, many citizens are to migrate and 6.5 million people had already been displaced by 2013 (Afrin.A, 2015). The capital city of the country and other urban area are also targeted by the displaced people.

Health Sector

Human health is severely affected and at risk due to the frequent changing of climatic variability. The changes in exposure to heat and cold waves, increases in inundations, storms, droughts, increased air pollutants and aeroallergens like spores and molds are all considered to have direct impacts on the health sector in terms of lives lost, injuries, and disease outbreaks.

Coast of Bangladesh

There are 19 districts out of 64 and 32 percent of the country comprised of coast, basically these areas are extremely fertile and very much exposed to multiple natural disasters. Nearly one-third of the total population of Bangladesh live in the coastal districts. Coastal districts are rich with natural and mineral resources like gas and oil, not only this zone also accounts for 1.95 million ha or 41% of the total national agricultural land (TNC, 2018).



However, this zone is particularly exposed to the cyclone, storm surge, tidal flood, coastal erosion, water logging, variations in temperature and precipitation, entering saline water, and rise of aquatic level.

Adaptation Strategies

There is huge land scarcity in Bangladesh as it provides the main basis for human livelihoods and well-being. IPCC predicts that Bangladesh is in line to lose 17 percent of its land and 30 percent of its food production by 2050. As a result, extensive damage to infrastructure, housing, agriculture, and livelihoods once in every three to five years will have occurred. The incidence and magnitude of cyclone and storm surges are also increasing and the communities of the coastal areas are also at severe risk. To save land and people from degradation, several initiatives have already been taken and different sizes of projects also implemented so far on the basis of local needs. Some of initiatives are described below based on matters got priority for adaptation in Bangladesh:

Table 1: Adaptation Priorities for Bangladesh	
1	Improving warning systems for cyclones, floods, and drought
2	Construction cyclone shelters
3	Climate resilient infrastructure, housing and communication
4	Repairing and rehabilitating of infrastructure
5	Research and knowledge management
6	Adaptation on the basis of local knowledge at local level
7	Adaptation to climate change to impacts on health
8	Improving capability structure at all level
Source: TNC, MoEFCC	

National Adaptation Programme of Action (NAPA). National Adaptation Programme of Action (NAPA) was made in 2005 provided a process for LDC like Bangladesh to recognize significant areas. It had been responded to their crucial and instant needs to adapt to climate change so that belated response could not increase vulnerability and cost (UNFCCC 2009). Prioritized adaptation events and projects, short identity of individual project has been designed in the NAPA to expedite the improvement of applications for execution. Following the guidance of UNFCCC, NAPA mainly focused on existing information but it did not emphasize on new research basis. As a result, the scope of it was more action-oriented and local community-driven as well as workable and built on compliance with national situations.

Bangladesh Climate Change Strategy and Action Plan (BCCSAP). Taking into consideration of the requirements of the poor and susceptible community, BCCSAP was adopted in 2009 for the duration of ten years (2009-2018). For successful implementation of this action plan, a fund was generated with the revenue budget of the Government following the guidance of the Honourable Prime Minister Sheikh Hasina. Bangladesh played a pioneering role by the formulation of such a holistic action plan and creating fund among the developing countries. The fund is being used for building capability and resilience in the country to face the challenges

of climatic variation given priority. It also emphasized on effective implementation of the action plan by the close monitoring of the National Environment Committee chaired by the Honourable Prime Minister.

The Perspective Plan (2010-2021). The commitment of Government for the persuasion of low carbon emission to be addressed in the development programme has been highlighted. The strategies for environmental management, addressing climate change and disaster risk reduction issues have also been communicated in the plan.

The 7th Five Year Plan (2016-2020). Several activities for Climate Change Adaptation have been proposed in this plan. It has stressed the need to take into account environment, climate change adaptation and mitigation in a broader development perspective.

Bangladesh Delta Plan 2100 (BDP 2100). The Bangladesh Delta Plan 2100 integrates all climate related sectorial plans to tackle the risk from climatic variation to the livelihoods in the delta and floodplain region. To address climate related risks, BDP 2100 has been aligned with national goals and outlines policies for six hotspots. These six hotspots are “Barind and Drought-Prone Areas; Chittagong Hill Tracts (CHT); Coastal Zone; Haor and Flash Flood Areas; River Systems and Estuaries; and Urban Areas”.

Country Investment Plan (CIP). This Country Investment Plan was developed in 2017, providing a strategic framework in order to establish an effective preparation and direction of utilization of monetary fund for protecting environment, forestry and climate change sectors. The timeline of this framework was settled for 5-year. Under this framework, the areas are considered in linking with the pursuance of Paris Agreement for investment and targets.

National Adaptation Plan (NAP). MoEFCC has taken initiative to develop a comprehensive National Adaptation Plan highlighting to chart its objective of becoming climate-resilient by 2030. All elements of research,

knowledge management, institutional management, integration, priority adaptation action will be taken into account to include in the document.

Financial Flows to Address the Initiatives

International Adaptation Finance. A financial mechanism for supporting the developing country parties in terms of adaptation activities was incorporated at the UNFCCC. There were three types of funds operated under the financial management wing of the convention; the funds are categorised as “the Special Climate Change Fund (SCCF)”, “the Least Developed Countries Fund (LDCF)” and Global Environment Facility (GEF). Copenhagen Accord was signed in 2009 and made a consensus to send \$100 billion per year through 2020 for assisting developing countries to inscribe climate change mitigation and adaptation. As a result, through continuous negotiation by the developing countries, another fund named the Green Climate Fund (GCF), was ultimately developed.

National Adaptation Funds. Government of Bangladesh has developed a national adaptation fund based on local revenue from the national budget. Outlines of adaptation funds are as mentioned below:

- **Creation of Bangladesh Climate Change Trust Fund (BCCTF)**

The most significant and effective initiative was the creation of Bangladesh Climate Change Trust Fund (BCCTF), which had a yearly national allocations from the government revenue budget. About US\$100 million of monetary funds has been distributed to the Bangladesh Climate Change Trust (BCCT) in 2009-2010, and a Board of Trustees was also established under BCCT to govern the fund BCCTF. The MoEFCC functions as the Secretariat for the BCCT.

Following the settled six pillars and 44 programmes in BCCSAP, BCCTF was created to finance projects for implementation. The projects undertaken

from BCCT include construction of embankments, protection of river banks, building cyclone resilient houses, excavation or re-excavation of canals. These initiatives will ensure to maintain the flow of water, building of water regulator structures including sluice gates, waste disposal and drainage structure, starter and distribution of pressure accepting crop diversities and seeds, afforestation and installation of solar panels.

- **Bangladesh Climate Change Resilience Fund (BCCRF)**

The government of the United Kingdom assured to provide £75 million (US \$117 million) as a grant to promote climate change adaptation in Bangladesh in 2008. Bangladesh Climate Change Resilience Fund (BCCRF) was created by this funding along with assistances received from other donors. An independent body Palli Karma Sahayak Foundation (PKSF) was assigned to govern small scale funds for NGOs in concurrence with the MoEFCC.

- **Climate Financing Budget Bangladesh**

Finance Division allocated climate change related budget for the twenty line Ministries and Divisions of the country, the cumulative amount was 45.84 percent of the total national budget of FY2018-19 and 8.82 percent was climate relevant. Climate financing budget report provided a view of vulnerability scenario due to climate change, concerned conventions, protocols and agreements, the state of climate financing and governance of climate funds in Bangladesh, including the climate fiscal framework.

Adaptation Practice in the Southern Part of Bangladesh

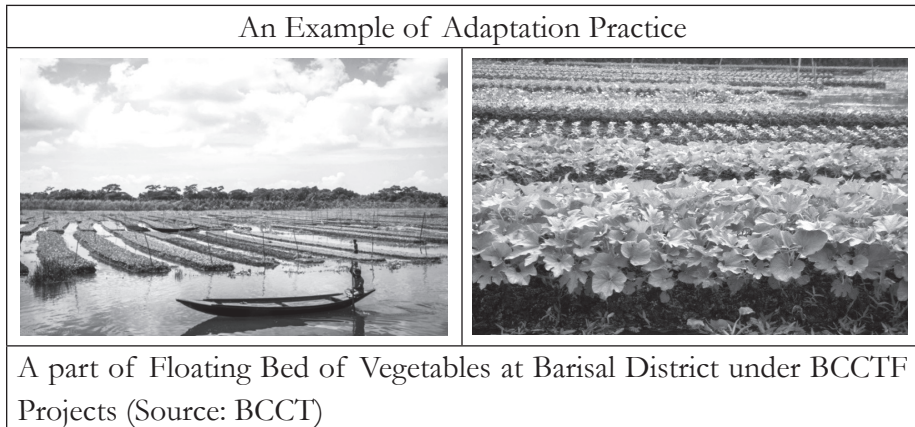
Intervention taken to Address the Effects Emerged by Climatic Change. By Addressing the first pillar of BCCSAP for ensuring access to basic services for the most poor and vulnerable group, a project was implemented; a brief description of that project is given below as an example:

Name of the Project: Promotion of Floating Garden under Agricultural Practices at the Water Logged and Flood prone Areas in Bangladesh as a part of Adaptation Technology.

Funding: USD 1.88 million by BCCTF

Executing Agency: Department of Agricultural Extension

Project Area: Part of Gopalganj, Pirojpur and Barisal Districts



The activities of this project was mainly executed at the wetland of above mentioned three districts. The livelihood of the wetland ecosystem based community was constrained by not getting farming land. Farmland always would have remained under water due to poor drainage system.

Farmers could not cultivate any crops on the submerged farmland, as a result, poverty and hunger was severe in that region. To overcome this situation, farmers developed the unique floating garden agricultural practice by using their own inherited knowledge with the support of the Department of Agricultural Extension. In this system, no soil was used for rearing plant and crops; only local natural resource based nutrient used as supplementary. The floating bed on the surface water had been utilized as farming land in which vegetables, spices, and other crops grow all the year round. By the implementation of this project, the socio-economic condition of that region had remarkably improved. This Project has got a National Heritage Award under the United Nations in 2016 for its towering success.

Analysis on Effectiveness of the Strategies

Findings

Key Informant Interviews (KII) from MoEFCC, DoE, DoF, BCCT and PKSf has been selected to know their opinion about the initiatives taken to face the adverse effects of climate change. A brief-expression is given below:

- In terms of policy document NAPA, BCCSAP, Delta Plan 2100 are considered in giving guidelines for adaptation towards climatic variation. The respondent from the MoEFCC emphasized that Bangladesh was pioneer in formulating BCCSAP in 2009 which was internationally acclaimed. The Government of Bangladesh has channelized financial support to execute 44 programs and 134 concrete actions outlined in BCCSAP by BCCTF.
- Regarding initiatives, most of the officials believed that policies were formulated mainly on urgent need basis of concerned community. However, all respondents expressed their opinion in favour of necessity of research to get better outcome in the long run.
- Regarding effectiveness they informed that projects were implemented in line with the objective of NAPA and BCCSAP, in this perspective targeted vulnerable population had been benefitted. However, some of them think that a comprehensive assessment is needed to examine the reality whether the concerned community getting benefit through those initiatives or not.
- About 62% respondent's perception is in favour of full benefit received by the targeted community from different implemented projects. On the other hand, 25% respondents think that a detail evaluation is needed for assessing the exact scenario of assistance coming from executed interventions. Moreover, 13% interviewee stated that a bottom up approach needed during the formulation of Policies; if the top down approach applies that would not bring desired outcome in

the long run. As a result, the expenditure of huge budget would not be cost effective in addressing the negative impact of climatic variation.

- From the above analysis, it can be said that considering the urgent need of climate affected community many initiatives had been taken. However, those were not research based and not much projected by visualizing the future challenges. As the morphology of the coastal and flood plain areas are gradually modifying due to changing effect of climatic variables. As the Government of Bangladesh has given proper attention to this issue, a huge amount of revenue budget has been channelized each year, so an integrated research based initiative is a must.

A Brief Analysis of the Strategies

Government of Bangladesh has given a sincere effort to address adverse effects caused by climate change across the country. Policy documents have been formulated following principles of UNFCCC, and the local needs of vulnerable area. On the basis of guidance, different Ministries, Departments and Agencies implemented huge number of projects. However, those projects were mainly designed for highlighting the adjustments to improve the viability of social and economic activities and to reduce their vulnerability to climate change. Policy guidelines such as NAPA, BCCSAP, 7FYP, CIP, Delta Plan 2100 are still at executing stage and some of them are completed by this time. It is true that communities of different locations of the country are getting benefit through the successful implementation of these projects. However, there are some questions raised in terms of longevity and getting long term benefit issue; as millions of dollar has already been expended especially in the coastal areas.

It may be mentioned that there are shortages in human resources in concerned department who are supposed to be directly involved for monitoring project activities. As severity and damages related to floods,

cyclones and sea-level rise are increasing day by day; strategies are taken to revisit and to re-think. If the research-based study were included in the proposal stage, the expected result would have achieved. As a result, expenditure of the revenue fund could bring a sustainable outcome for the community. To face the harmful effects of climate change usually small sized projects are implemented within a short period of time (1 to 2 years). Thus, activities did not get long terms positive impacts to the livelihood or locality. For getting long term positive outcome a large scale project implementation is essential which needs research based more investment.

In addition to that the United Nations Environment Programme (UNEP) gave recognition of Bangladesh Government's initiatives in facing challenges from climatic variation. For the visionary leadership towards environmental sustainability, Honourable Prime Minister Sheikh Hasina received the 'Champions of the Earth Award' from UNEP in 2015. The award was in recognition of Bangladesh's far-reaching initiatives in addressing problem induced by climate change under her government. This recognition has enhanced the image of Bangladesh in the field of adaptation capability by the resilient community. To uphold this image, a comprehensive research-based intervention by considering long term vision is essential.

Conclusion

Analysis of strategies taken to address the adverse effects of climate change in Bangladesh has been presented in this research paper. People of Bangladesh have learned to live with the altered climatic condition which indicates term "adaptation" since decades. The government, NGOs, individuals are working in line with policies developed. The illustration of the climate system is a complex system, which is being changed by the greenhouse effect has been discussed. The trapping mechanism of infrared radiation and making Earth's atmosphere warmer is a burning issue for the scientists and policy makers. The effect of climatic alteration is more concerned for Bangladesh because of its geographical location.

Most of the land of this country is situated on the deltas and flood plain areas of three main rivers. Due to the high dense populated country become more susceptible to the changing trend of climate. By this time, Bangladesh has made a significant progress in improving the wellbeing and financial development of the citizen of this country; however, the climatic risks are threatening the successes. Many important sectors like agriculture, migration, health and livelihood are extremely under threat.

By mobilizing the local resources, MoEFCC is playing a lead role in formulating policies, implementing projects with the support of different executing agencies to address the adaptation strategies. Various types of adaptation strategies are applied so far. Community people are being benefitted through these initiatives indeed. However, based on the urgent need of the community most of the initiatives have been executed; the long term effects are not much considered. Thus, frequent changing pattern of climate variables are posing serious threat to the vulnerable areas. The physical characteristics of the delta and flood plain are changing rapidly which needs comprehensive attention to face the future challenges emerged by climate change.

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Khorsheda Yasmeen is a member of Bangladesh Civil Service (Administration), currently working to the Ministry of Public Administration as Additional Secretary. Prior to her recent appointment, she had been working in the Ministry of Environment, Forest and Climate Change. Khorsheda received her undergraduate degree as well as Master of Science from the University of Dhaka in Geography. She also received Master of Science in Environmental Studies from the University of Newcastle, Australia. She also published a research article named "Role of Tropospheric Ozone in the Context of Photochemical Air Pollution" in the Daily Star and "Ramsar Convention and Conservation of Important Wetlands of Bangladesh" in the Environment Day Memorial. She participated in a range of training programmes in the country and abroad. She also presented various academic as well as research based paper at national and international conferences including "13th conference on Convention on Biological Diversity in Cancun, Mexico in 2016" Open Ended workshop on Hazardous Wastes at Nairobi, Kenya and Biosafety Conference at Hydrabad, India. In addition to her academic career, Khorsheda held several managerial positions in the 13th BCS (Administration) Association as Vice President and Australian Alumni Association as Joint Secretary.

PROSPECTS OF WIDER REGIONAL COOPERATION WITHIN THE AMBIT OF CPEC - OPPORTUNITIES AND CHALLENGES FOR PAKISTAN

Brigadier Muhammad Shareef, ndc

Introduction

Advancement in technology is shrinking the world into a global village. Affluent nations are finding ways to boost bilateral trade and economic cooperation to remain economically viable in the international arena. As a consequence, Geo-economics is fast gaining primacy as a driving tool towards the attainment of Geo-political objectives. The 21st century has seen the emergence of China as an economic giant and USA is facing challenge of Chinese drive to overtake as world's largest economy. Taking a lead role from its rich history to re-connect and revive the old Silk Route, an ambitious program of Belt and Road Initiative (BRI) has been launched with the vision to expand China's economic outreach through connectivity and positioning itself at the center of a re-drawn geo-political Eurasia; through combination of inter-connected land and sea routes (Chatzky, 2020).

China-Pakistan Economic Corridor (CPEC) besides a strategic marvel, does owe its conception from Chinese compulsions of overcoming "Malacca Dilemma" (Zahid, 2019) and execution of "Western Development Plan" (Venancio, 2018). While CPEC promises to bring economic prosperity, uplift of people, upgrading of its energy resources and increase in trade volume; true economic potentials of Pakistan will have to be amassed in integration of CPEC while, also looking beyond CPEC, in transforming Pakistan into a regional trade and transit hub by homing on the freshly recruited concept of "Zipper State" (Saleh, 2019). To capitalize on the economic potentials of the region and the geo strategic location of

Pakistan on the junction of various regions and energy corridors, it's apt time to place Pakistan on the path of success turning the country into a "Prosperous Pakistan" by fully exploiting the afforded opportunities.

Literature Review

The inherent potential of CPEC for promoting regional integration under the ambit of BRI has also been debated, however, no clear road map has been outlined for exploiting such a possibility. Rolland (Rolland, 2017) has analyzed the concept's origin, drivers, components, objectives both in geo-economics and geo strategic domains. Ishaque, Syed, and Adeel (Ishaque, 2018) have analyzed CPEC in geo-strategic, geo-economics and diplomatic domains while recommending policy options for Pakistan. Faisal (Faisal, 2019) has described that economic corridors can open up new avenues for instituting intra and inter regional linkages, have the potential to integrate economies and can function as the building blocks for wider regional economic integration while creating conducive environment between rival states. Imtiaz (Imtiaz., 2016) while emphasizing other aspects also highlights the need for sustainable peace in Afghanistan and proactive engagement with Iran for Iran-Pakistan Gas Pipeline for further enhancing economic integration. Amir (Amir, 2016) asserts that enhanced Chinese stakes in Afghanistan, Iran's exhibiting interest to join CPEC and the ever-expanding volume of trade between China and India are brighter aspects of regional cooperation. Khan, Changgang and Afzaal (Khan, 2019) have highlighted that CPEC provides a great chance for Central Asian Republics to increase their trade specially their untapped mineral resources through the new connectivity grid. Ali (Ali, 2016) has also stated that the CARs have always eyed on exploring regional markets including South Asia, China and East Asia for their products specially minerals and CPEC is providing them a great opportunity to pursue their desires. He further highlights that "CPEC and Bangladesh China India Myanmar (BCIM) can foster a new economic and trade beginning between the South, West, Central and East Asia".

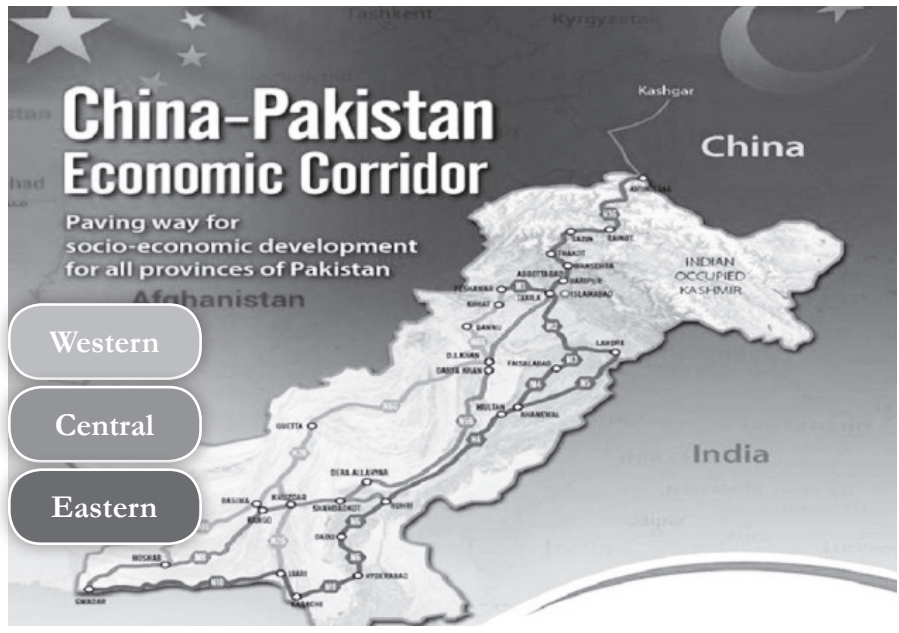
Research Methodology

A qualitative approach has been employed to carry out the research. Mainly descriptive research design has been used to analyze the issue at hand. The research is primarily based on secondary data from various books, official documents, formalized studies conducted and synonymous research carried out by different scholars on the subject from Pakistan, China and other South Asian countries.

Overview of CPEC

Concept. CPEC aims at connecting Western China with Gwadar through a corridor based on roads, railways and energy pipelines. “It is not only a ‘game changer’ for China and Pakistan but for the entire region as well. CPEC spatial layout includes One Belt; Core area Kashgar-Khunjerab-Islamabad-Lahore-Sukkur spreading on two routes, one to Karachi and the other to Gwadar, Three Passages; The Western, Central and Eastern routes, Two Axes; Lahore-Islamabad-Peshawar and Karachi-Gwadar development axes”. Five Functional Zones includes; Southern Xinjiang Zone (Kasghar-Atushi-Tumshuq-Khunjerab), Northern Pakistan Zone (Khunjerab-Islamabad), Central Pakistan Zone (Karachi-Sukkur-Multan-Lahore Islamabad), Western Pakistan Zone (Gwadar-Quetta-D.I.Khan) and Southern Pakistan Zone (Gwadar-Karachi) ” (MoPD, 2020)

Map 1: CPEC Routes



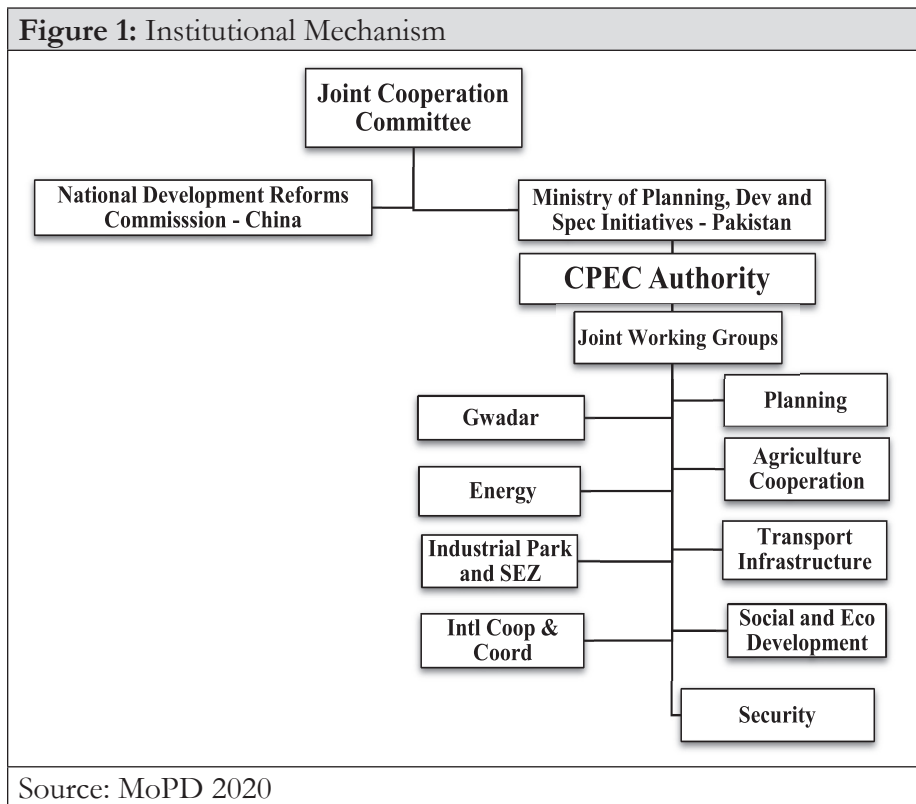
Source: National Highway Authority of Pakistan

Goals. By 2020, CPEC strives to take the initial shape, major bottlenecks to Pakistan’s economic and social development shall be basically addressed, and CPEC shall start to boost the economic growth for both countries”. By 2025, CPEC building strive to be basically done, the industrial system approximately complete, major economic functions brought into play in a holistic way, the people’s livelihood along with the CPEC significantly improved, regional economic development more balanced, and all the goals of Vision 2025 achieved”. By 2030, CPEC building strive to be entirely accomplished, the endogenous mechanism for sustainable economic growth in place, CPEC’s role in stimulating economic growth in Central Asia and South Asia brought into holistic play, and South Asia shall grow into an international economic zone with global influence” (MoPD, 2020).

Key Cooperation Areas. During President Xi Jinping’s visit to Pakistan in April 2015 Pakistan and China agreed to formulate a mechanism with a view to steer developmental activities under CPEC. Thus, Long Term

Plan for CPEC spanning from 2017 to 2030 was finalized. Key coop areas include connectivity, energy related projects, trade and industrial parks, agricultural development and poverty alleviation, tourism, financial cooperation and people to people exchanges encompassing governmental, civil society and non-governmental representatives.

Institutional Mechanism. Joint Working Groups have been formulated in each field by both the countries to recommend and oversee projects by the Joint Coordination Committee (Obortunity, 2020). National Development and Reform Commission (NDRC) of China and Pakistan’s Ministry of Planning, Development & Reform (MPD&R) are the focal ministries for undertaking projects under CPEC (Imtiaz., 2016). CPEC Authority with a dedicated Chairman is responsible for planning, coordination, implementation and supervision of all the projects.



Financial Structure. Financial layout of CPEC (Khan, 2019) related projects is as under: -

Table 1: Financial Layout of CPEC	
CPEC Component	Cost (US \$ Bn)
Energy related Projects	34.413
Communication Infrastructure (road, railway, aviation)	15.143
Gwadar Port related Projects	.793
Industrial and other Projects	1.817
Other Projects added	9.847
Total	62

Major Projects and Their Progress

Energy Sector Projects. There are 9 coal projects, 3 hydropower projects, 1 solar energy projects and 5x wind energy projects. Out of these around 9x projects with a capacity of 3790 MW have already been completed (MoPD, 2020).

Infrastructure Development

- **Road Infrastructure.** Most of the road projects along Western, Central and Eastern routes are likely to be completed by the end of 2018. Motorway from Hasanabdal – Shah Maqsood, Havelian- Thakot and Sukkur-Multan have been completed and made operational.
- **Railways.** Development projects encompassing railway infrastructure are likely to cost around \$ 8 billion including add-on of \$5.5 billion. Early Harvest Projects include the upgradation of ML-1 which has recently been approved by ECNEC. Orange Line Metro in Lahore has been completed and is fully operational.
- **Pipeline.** The envisaged gas and oil pipe line from Gwadar to Western regions of China spans over approximately 2500 Kms.

- **Optical Fiber.** Work on laying off 820 kms optical fiber was completed in July 2018.
- **Gwadar Port.** CPEC plans not to limit Gwadar to a connecting port only but enriches it as an economic hub that will cater to the local population by improving their livelihoods. Projects planned for the Gwadar Port City are aimed at capacitating Balochistan to its full economic, social, technical, and energy potential, and closely integrating it within the economic framework of Pakistan and China.

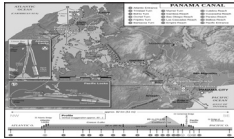


Industrial Cooperation. 9 sites have been identified as SEZs along CPEC routes with a varying cluster of industries based on the local economic and commercial potential. All these projects are aimed to be completed by 2025.

Prospects of Regional Prosperity through Integration/ Connectivity; Challenges and Opportunities

Regional Integration in the Context of BRI and CPEC. Enhanced connectivity with immediate neighbours and across the region is essential for furthering regional cooperation. Pakistan's geo-strategic location and emerging commercial attractiveness presents both opportunities and challenges vis-à-vis regional economic and security interests. BRI specially CPEC strengthen and activate Pakistan's place in the regional value chain with global outreach. This necessitates a pragmatic approach for promotion of not only regional stability but forging convergence of interests with other global and regional players.

Contemporary Connectivity Models

Salient Contemporary Models. Connectivity encapsulates cooperation through integration manifested in earlier contemporary models, i.e. Panama Canal, Suez Canal and European Union (EU). Salient Contemporary Models are shown in Table 2.

Table 2: Contemporary Models of Connectivity			
Salient	Panama Canal	Suez Canal	EU
Map			
Location	Panama	Egypt	Europe
Established	15 August 1914/ USA	17 November 1869/ French Company	1 November 1993/European Commission
Connectivity	Atlantic and Pacific Oceans	Red sea and Mediterranean Sea	European Countries
Length	82 Kms	193 Kms	National Road / Railway/Seaports
Distance Reduced	8000 Kms	7000 Kms	Connects EU Countries
Vessels per Year	Approx 13,500 per Year	Approx 17,000 per Year	-
Handed Over	1977 Joint management/ / 1999 handed over	1956 Suez Crisis/ 1962 handed over	Functional since 1993

Analysis - Contemporary Models. Comparative analysis of selected fields of economic indicators in addition to connectivity essential for economic growth are shown in Table 3.

Table 3: Comparative Analysis				
Economic Fields	Rankings / Statistics			
	Panama	Egypt	EU	Pak
Governance Effectiveness	91	132	10 x EU countries in Top 20	140
Corruption Perception Index	101	106	10 x EU countries in Top 20	120
Literacy Rate	95.41	71.17	7 x EU countries in Top 10	59.13
Human Resource Development Index	67th	116th	5 x EU countries in Top 10	152
Unemployment Rate	123	35	No EU countries in Top 10	143
GDP Growth Rate % (2018)	76th (3.6 %)	38 (5.3%)	46 (4.95%)	33th (5.8 %)
GDP Per Capita (US \$)	61st 11723	125th 2907	10 x EU countries in Top 20	157th 1197
Share of Manufacturing	126th	41st	8 x EU countries in Top 30	73rd
Population Below Poverty	22.1 %	27.8 %	No EU Cty in Top 30	24.3 %
External Debt US \$	22.9 Bn	109 Bn	Cumulative Debt 16.79 Trillion	106 Bn
Railways	128th	39th	7 x EU countries in Top 20	22nd
Roadways	-	73	5 x EU countries in Top 15	22nd
Export – US \$ Bn	74th – 15.5	57th – 47.5	8x EU countries in Top 20	70th – 27.6
Sources:(International, 2019), (CEIC, 2020), (Economy, 2020), (CIA, 2020), (HDI, 2019), (Bank, 2020) and (UNESCO, 2020)				

Connectivity Dividends for the Region and Pakistan

Economic Dividends of Connectivity

- **Enhanced Region-Wide Trade.** Connectivity will enhance region-wide trade between China, Iran, Afghanistan, Central Asian Region and Russia through Pakistan. Market potential offered and opportunities presented by countries along Belt and Road will benefit through job creation, enhanced investment and overall growth.
- **Shared Integration and Global Outreach.** The provision of connected land and sea routes promotes integration and shared prosperity. Ease in regional trade opens up business prospects with other world markets enhancing global outreach and attraction of foreign direct investment (Observer, 2019).
- **Energy Cooperation.** SREB not only envisions energy cooperation in countries along BRI but also secures access to much needed energy from CARs and ME to China, Pakistan and India (if it opts to join CPEC). Petro China alone has more than 30 overseas projects along the span including Sino-Kazakhstan Oil Pipeline, Amu Darya Right Bank natural gas project, Ahdab, Rumaila and Halfaya projects, Central Asia Gas Pipeline with Turkmenistan / Uzbekistan and the China-Russia crude oil pipeline (Marc, 2017).
- **Cultural Exchange and Economic Diplomacy.** Another realm of interaction presents enhanced people-to-people and cultural exchanges; promoting harmony, peace and promoting economic diplomacy (NDRC, 2015).
- **Enhanced Relations and Prestige.** Connectivity amongst countries would also contribute to enhancing foreign relations, international image and prestige. Pakistan stands to benefit the most, as it is set to become a trading hub for the region as well as for extra regional trade and transit.

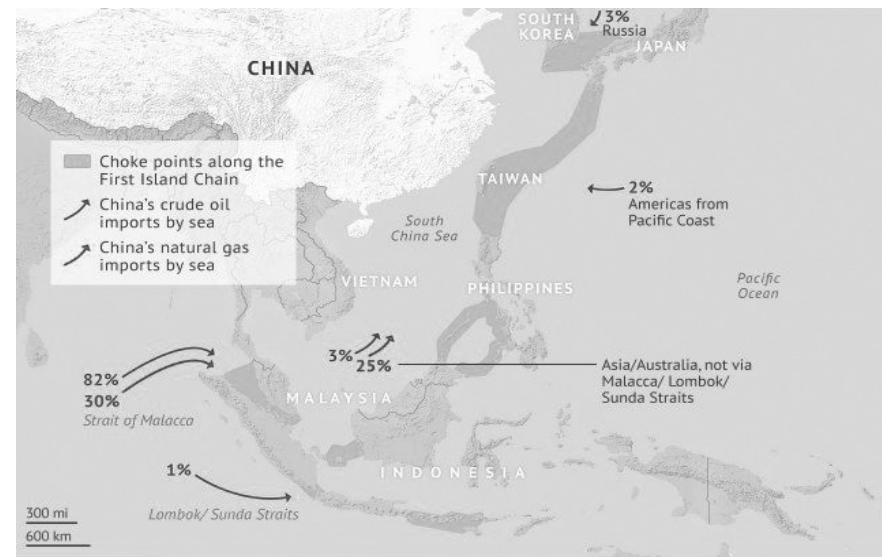
Conflict Resolution /Management through Connectivity. Connectivity with Afghanistan transforming it into a hub of trade with CAREC and South Asia shall prove to be a stepping stone for peace and stability (Khan, 2016). Moreover, consensus on bilateral connectivity with Iran shall enable to further regional cooperation. Post success and corresponding economic dividends of Westward connectivity shall then have its spill over impact for extending Eastward to India.

Opportunities for Prosperity – Region and Beyond

China. Trade through CPEC will help to bridge development gap in Chinese Western regions through investment, economic uplift and integration (Marc, 2017). China's expenditure of US \$ 18 million per day on import of 6.3 million barrels of oil from the Middle East, traverse over 9,912 miles. Transportation costs can be cut even if China uses CPEC for only 50% of its oil imports saving US \$ 6 million per day (Salman, 2015).

Afghanistan. Afghanistan stands to gain the most from connectivity by serving as a bridge between CPEC and CAREC bringing shared economic revival, integration, peace and stability. Enhanced trade, transit and economic interdependence will help in fostering mutual trust and open up avenues for lasting stability conducive for trade (Khan, 2016). Moreover, access to Karachi will be complemented by Gwadar Port through Chaman reducing trade route by 600 kms (Butt, 2015).

Map 2: China's Import Transit Routes and Maritime Chokepoints



Source: (ISDP, 2016)

Iran. Connectivity with Iran via Gwadar shall open avenues towards ME, Turkey and EU. This connectivity if materializes is set to expand trade by US \$ 600 billion with China through Pakistan. Moreover, expected Chinese mega investment of around US \$ 400 Billion in Iran shall greatly contribute towards boosting regional integration (Cohen, 2020). Gwadar can also harmonize trade in coordination with Chabahar port (Butt, 2015).

CAREC. Pakistan offers shortest land access to CAREC for establishing regional energy market promoting energy security. Connectivity with CARs through Pakistan takes only 2600 kms as compared to 4500 and 5000 kms through Iran and Turkey respectively (Masood, 2016)

India. Indian opposition of CPEC undermines prospects of East – West connectivity. Indian transit trade of oil/ gas through Pakistan is estimated around US \$ 10 Billion. Moreover, volume of Indian trade is expected to cross \$ 500 billion in next ten years. If only 1/5th of this trade passes through Pakistan it would likely be around \$ 100 billion annually (Masood, 2016).

Middle East. Trade between China and the ME has increased rapidly to 600 percent in the last decade to around US \$230 billion. With KSA showing investment interest in turning Gwadar into an oil city, trade with KSA in particular and ME in general through Gwadar – Kashgar link will enhance manifolds.

Eurasian Union. Thaw in Pakistan - Russia relations have prospects of Russia using Gwadar for trade with ME and Africa with possibility of linking Russian backed Eurasian Economic Union to CPEC (Masood, 2016). With likely inclusion of Iran, Turkey and Russian, vibrant EU markets will be accessible through Pakistan to China and ASEAN countries.

Challenges to Regional Connectivity and Prosperity

- **Balancing between China and US.** US strategic concerns to limit Chinese influence in Indian Ocean Region through its strategic alignment with India is a crucial challenge for achieving regional connectivity through CPEC.
- **Competing Interests.** Competing interests in the regional and global context pose a dilemma for Pakistan leading to covert hostilities. Quest for political space in Afghanistan and Gwadar vs Chabahar competition has added fuel to proxies in Khyber Pakhtoonkhwa / Balochistan.
- **Disrupting Relevance.** India considers Pakistan the hurdle in furthering its regional ambitions and East-West connectivity. Development of Chabahar Port and linking it to Afghanistan is all aimed at bypassing Pakistan and making it irrelevant (Ali, 2019).
- **Instability in Afghanistan.** The conclusion of peace treaty between US and Taliban is a positive development which has kindled a way forward for attainment of sustainable peace in Afghanistan. However, the smooth execution of peace shall remain a challenge.

- **Indian Antagonism to CPEC.** Growing strategic bondage between Pakistan and China is considered a threat by Indian security architecture. India has declared opposition to CPEC on the pretext that it is planned through the disputed territory of Gilgit Baltistan which has also struck a chord with the US (Ali, 2019).
- **Trade War and US Sanctions.** Ongoing US-China trade confrontation and US sanctions on Iran are likely to negatively impact CPEC vis-a-vis connectivity, wherein, US attempts to contain gains made by China.
- **The Chabahar Factor.** Indian involvement in development of Chabahar Port to counter the expected economic benefits through Gwadar remains a concern for Pakistan (Butt, 2015). Recent expulsion of Indian from Chahbahar-Zahedan Railway Project and likely mega Chinese investment in Iran are positive developments to neutralize inimical Indian designs.
- **Perception Management.** Anti CPEC perception on social media in general masses vis-a-vis contracts, debt trap and economic feasibility is a challenge. The negative trend needs to be addressed through effective media management; projecting it as “mega project” of “critical national interest” (Chatzky, 2020).
- **Security and Stability.** Internal security dynamics of Pakistan has remained a challenge in the recent past and served as a show stopper in the process of economic development and prosperity. Conflicting interests of regional and global players in the region and beyond has made the country a battle ground for many hostile actors (Ali, 2016).

Pakistan as a Transit and Trade Hub; Beyond CPEC

Regional Transit and Trade Hub-Fields of Prospects

Gwadar Port-Transit and Trans-shipment Hub. Gwadar Port provides an opening to three most commercially important regions. It would offer transit trade to the land locked Afghanistan, CARs and Western China

with a shortest route to the world market (Masood, 2016). The port has the capacity to transform into Oil and Petro Chemical Hub with the investment of KSA's in mega oil city of 80,000 acres. The energy resources of CARs will also find suitable storage at Gwadar due to its unique strategic location. Moreover, development of multifarious industries would be best suited at Gwadar due to deep sea port facility.

Industrialization and Export Promotion. Establishment of SEZs figure out as the corner stone of Pakistan's future outlook as an important transit and trade hub in the region. Ground breaking of Allama Iqbal Industrial City, Faisalabad has already been done in January 2020. Work on Rashakai Economic Zone, Nowshera and Dhabeji Special Economic Zone, Karachi are likely to commence in the current year. Planning work on remaining economic zones are also underway and in different stages (CPEC, 2020).

Logistic Industry. Completion of CPEC is expected to reduce the travel distance by 50-85 % for more than 33 % of China's current container traffic directed towards Europe (70 Mn Containers), Middle East and Africa, with trade estimated over US \$1 Trillion. "Pakistan's possibility of sharing 10-15 % of Chinese trade would however, depend upon its capacity to handle the volume of transit trade. Freight terminals planned along the corridor will facilitate Pakistan's logistic industry and transport sector would get a huge boost." (Masood, 2016)

Oil and Gas Exploration. Pakistan has healthy energy resources (51 trillion cubic feet - shale gas, 186 billion tones - coal reserves) in addition to on and off shore oil & gas reserves and renewable energy resources (Saleh, 2015). The basic need for the sustainable development is effort to minimize the oil imports and attempt to reduce from 85% to 25% in next five years through new explorations.

Mineral Exploration. Pakistan has the world's second largest salt mines, fifth largest copper and gold reserves and second largest coal deposits. Despite huge potential, contribution of mineral sector to Pakistan's GDP is around 3 % and country's exports are only about 0.1% of the world's total. In the year 2017, (Shah, 2018).

Agriculture Sector. “Agriculture contributes 18.5 % to Pakistan’s GDP and provides 38.5% employment to national labour force.” (Finance Division, 2018-19). Agricultural development has found renewed focus in the second phase of CPEC under LTP. The areas of focus include enhance yield, improve processing, storage and transportation. Moreover, adoption of modern irrigation techniques while conserving water resources and increasing production area are also on the cards.

Regional Transit and Trade Hub-Enablers

Political Stability/Consensus. Political stability and clarity of cause at the leadership level are imperative for the success and prosperity of the country. In Pakistan, there is a strong cross cutting general consensus amongst all the institutions about pursuing CPEC.

Governance System. Pakistan is included amongst the ten countries who implemented 1/5th of all the reforms recorded worldwide during 2018/19 and have been ranked at 108 in ease of doing business. However, much is still needed to attract FDI in the country.

Operating Environment

Energy Development. Economic Survey 2018-19 unfolds that Pakistan’s installed capacity has shown 30% growth in 4 years and electricity generation has surged up to 34, 282 MW by March 2019 with the addition of 12,230 MW. The energy demand shall surpass 80,000 MW by 2040 with medium growth rate of around 5.5 % (NTDC, 2019). The key requirement is continued focus on electricity generation capacity with a balance mix to ensure desired sustained growth in industrial, agricultural and trade sectors.

Foreign Investment. Investment in Pakistan is likely to be impacted adversely due to COVID 19 in short term, however, considering overall economic reforms and measures to improve ease of doing business it is expected rise in the mid and long term. Moreover, projects undertaken as part of CPEC shall continue to generate economic activity.

Human Resource Requirement. CPEC is likely to boost economic activities and create jobs. “The early harvest projects under CPEC have created more than 75,000 direct jobs and 200,000 allied jobs for Pakistanis while the mid and long term projects are poised to create more than 700,000 employment opportunities in the country.” (Finance Division, 2018-19). Skilled manpower such as engineers, economists, HR managers, technical workforce and interpreters of Chinese language shall be in great demand.

Security Challenges. Security situation has considerably improved; however, it remains a significant and perpetual challenge for realization of prosperity in Pakistan. Raising of Special Security Divisions has been vital in ensuring protection of CPEC related projects.

Conclusion

- Pakistan and China share a common vision, goal and broader conceptual contours of CPEC under the overall umbrella of BRI while focusing on their respective national interests. The strategic alignment of interests between the two countries has led to steady progress of projects despite resistance from inimical forces.
- Wholehearted support for CPEC in Pakistan across political, social and institutional spectrum enhances greater prospects of its sustainability and success.
- Success of CPEC is not only critical for the development and prosperity of Pakistan and Western regions of China but also vital as flagship project of BRI for branding to the world at large.
- Beyond CPEC; Pakistan by virtue of its geo-strategic location and trade transit opportunities, retains potential to transform the bilateral project into a regional initiative through connectivity.
- Regional connectivity and economic interdependence through CPEC have potential to foster political integration, peace, stability and conflict resolution with immediate neighbours.

- Competing interests of regional/ global players and resulting instability inhibits regional neighborhood connectivity and greater economic integration; warranting a prudent approach in diplomatic domain for forging convergence of interests with all stakeholders.
- Connectivity translates into sustained economic growth only if premium is placed on industrial development, enhanced production capacity and exports.
- Mere connectivity does not render economic progress unless backed by effective governance and development of human resource.
- Comprehensive trade and transit mechanisms are essential for developing a shared economic consensus with Iran vis-à-vis Chabahar and Gwadar.
- Industrial development while fully operationalizing SEZs along with commercialization of Gwadar Port holds the key to Pakistan's development.

Way Forward

- Enhance positive relevance of Pakistan through robust diplomatic maneuver principled on regional peace construct while focusing on bridging trust deficit and constructively engaging with regional and global players.
- Carryout perception building of CPEC as an inclusive rather an exclusive project while enhancing transparency and also proactively projecting the successes through all forms of medium.
- Develop Gwadar Port as regional transit and Trade hub in the stipulated timeframe while focusing on transforming Gwadar City into an international standard port city with all enabling facilities for enhancing trade and commercial activities.

- Promote and diversify investment in multifaceted development projects while attracting foreign direct investment through improved friendly business environment and timely establishing all the envisaged SEZs.
- Enhance public private partnership in development projects thus ensuring minimum reliance on external debt.
- Improving industrial base and competitiveness while incentivizing and diversifying export industry and increasing the spread of export basket.
- Improve productivity in agriculture industry and enhance agricultural exports while adopting modern farming techniques and appliances while exploring non-traditional markets specially in aspects like Halal Food.
- Prioritized westward connectivity complemented later by Eastward expansion while focusing on reinvigorating Afghan trade connectivity in short term and promote consensus on bilateral connectivity with Iran in mid term. Later, based on success and corresponding economic dividends, establish westward connectivity with India.
- Re-invigorate regional connectivity projects like CAREC, TAPI, TUTAP and CASA while integrating them with CPEC.
- Ensure security and stability while focusing on intelligence coordination and developing and efficient response integrating all law enforcement agencies.

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ASYMMETRIC WARFARE AT SEA: SRI LANKA NAVY MARITIME SECURITY STRATEGY, IMPLICATIONS AND WAY FORWARD

Commodore Mahamudalige Herby Nishantha Peiris, ndc

Introduction

Maritime Context of Sri Lanka. Over a period of time, it has been notified by the great strategists, that the importance of the ocean with different predictions and estimations of the great ocean such as peace and security, maritime threats, governance and harnessing of the resource etc. Admiral Alfred Tayler Mahan, the great naval strategist had anticipated the future of the IO in his book titled “Influence of sea power upon history” as mankind first sailed the great ocean has concerned over freedom of movements of the sea, which later transformed as a freedom of navigation. The principal conditions which affects maritime power of the country is its geographical position, size of the country with coastal belt which decides amount of sea borne trade and threats, maritime ambitions of neighbors. Non Traditional Security (NTS) threats in maritime environment is transnational and complex. However, majority of those threats are emerging in littorals. These littoral areas are typically a strategic areas and extremely vital for economic growth and social habits of the country. Hence, protection of these areas from threats pose by non-state actors are of paramount of important and mean time there is an obligation to protect maritime space by deploying its maritime force in effective and efficient manner. In the absence of strong security systems in maritime domain will result in favorable circumstances for non-state actors who engage with illegal activities. The threat occurred due to those activities can be measured in two folds; traditional threats and non-traditional threats in which traditional threats are dropping in

the maritime environment at present and non-traditional threats such as maritime terrorism, maritime piracy, drug trafficking, gun-running, human smuggling and illegal fishing are gradually increasing. The ability to deal with above threats will be a case scenario depending on potentiality of the country concerned. SL, because of its location, has a greater responsibility to maintain security in her maritime domain in order to provide security for Sea Lanes of Communications (SLOC) as it is key to world's maritime trade and economy. In addition, ongoing maritime disputes and power rivalry between regional countries has also impacted on maritime security at high.

Maritime Interest of Sri Lanka. The strategic concept and the strategic culture of Sri Lanka (SL) explains how to address maritime interest under element of national power using available potentialities and the abilities to achieve those elements using limited resources particularly under country's financial constraints. As per the world order today, most of the countries in the world are adhered to the international conventions and treaties which relevant to peace and security, hence are enhancing global security. In this context, the conduct of the SL in global and regional level is much more satisfied as country maintains cordial relationship between other nations. SL's critical geographical location is provided greater importance for SLOCs and also shows large role to play on securing vulnerable commons in IO. In doing so, immediate purpose of maritime strategy is to contest the vital maritime interest at least up to some degree. Hence, SLN being the forward defense line of the country, has a huge role to play to ensure maritime security whilst concerning the security from its territorial waters to Exclusive Economic Zone (EEZ) and beyond. Thus, SLN desires to be formidable navy ensuring peace and security on the ocean whilst ensuring country's maritime interest with healthy maritime strategy.

Literature Review

The literature review examines the maritime security of IO and challengers to maritime domain. Development of NTS threats in the region by non-

state actors as well as power rivalry between regional powers against ocean due to different ambitious has impact on other littoral nations like SL.

Maritime Security and Domain Awareness. IO has become a critical area for both trade and security related issues. Rear Admiral DMB Wettewa (Retd) has pointed out during Galle Dialogue Maritime Symposium in 2017, that “It is vital, that we set our sights as a region in particular and far beyond in general, so that stability and peace could be established through domain awareness” (www.galledialogue.lk, 2017) . The ‘activity’ in the IOR is defined by wide-ranging trade, oil transfer and a spectrum of power rivalry with political turbulence by regional and extra regional countries in one hand, to threats from NTS and low intensity maritime offences on the other. IO is vulnerable to lawbreakers and criminals associated with numerous cases such as smuggling of drugs, armed robbery, piracy, illegal fishing, human smuggling and marine pollutions (www.info@iasscore.in, 2020). With a rapid growing economy and ambitious of great power status, China seems to be entered to the IO by becoming an active player in the region. This is the strategic shift of China’s maritime focus from the long standing focus on the Pacific Ocean to IO. China and SL are strategic allies that enjoying mutual help under long-running friendship in various fields.

National Defence Policy. National Defence Policy of SL has identified the defence capabilities of the country and the modernization efforts of military infrastructure with future well-being of the defence forces. The purpose of defence policy is to ensure the attainment of its objectives in clear and conscious manner while respecting rules (Abegunasekara, 2019). National Defence Policy of SL has elaborated that, the safeguarding of huge water body in IO is a responsibility of a country because of its location and focus on the key maritime corridors and all the challenges. “Sri Lanka Navy’s Maritime Strategy 2025” is the strategy adopted in 2015 which came in to existence from 2016 onwards. Today, the role played by the SLN out at sea is obviously assist the internal security to a greater extent and to maintain regional security up to a certain extent.

Advance Technology for Maritime Warfare. The rise of new technologies, advanced sensors and system has evolved maritime warfare at a rapid pace. Cost effective submarines and small surface warships are shifting the balance of power away from fleets of destroyers, frigates and aircraft carriers. These new platforms have given prominence to new era of AW. An article written to 'Defence Connect' by Stephen Kuper, has elaborated that the importance of increasing proliferation of advanced technologies including unmanned and autonomous systems, cost-effective, high-speed, heavily armed surface combatants has hindered the activities of both state and non-state actors, ranging from extremist organizations to people smugglers and organized criminal organizations, by establishing and maintaining sea control (Kuper, 2019).

Neighbors, Attention and Concentrations. Attention and the concentration of the neighboring countries towards IO for peace and security as well as for maritime commerce are crucial at present days. IO is a life line for large portion of the citizens in the world as mostly world populous countries lies in this region. Hence, concentration and attention of those countries towards usage of ocean and related facilities are obvious in ever challenging geopolitical maritime environment. SL shares physical maritime boundary only with India, but maintaining healthy relationship with number of maritime nations in the region and beyond. SL does not have any maritime dispute with any of the countries and all the agreements made in related to maritime aspects in accordance with UNCLOS which facilitates maritime governance, legitimate use of sea. However, emerging power rivalry between India and China is one which region has change its shape towards power balance environment. Chinese engagement with small states in the region under soft power military diplomacy with economical architecture shows anti US- Indian friendship which emerged recent past. Struggle between India and China has become a matter of displeasure for some of the littoral nations in the region too.

Non-Traditional Maritime Threats. Non-traditional maritime threats in IO has been challenging subject as it has increased during past time period. Maritime terrorism faced by SL maritime forces in the region in early 21st century was classic example for all littoral nations to understand the danger, damage of which country faced. On the other hand illegal activities by non-stats actors like human and drug trafficking , Illegal, Unreported and Unregulated Fishing (IUU), gun running, maritime pollution by dumping waste and other means have threaten the security of the region and created a great impact on safe seas and threat to SLOC.

Maritime Terrorism. The Council for Security Cooperation in the Asia Pacific (CSCAP) working group has defined maritime terrorism as: “the undertaking of terrorist acts and activities within the maritime environment, using or against vessels or fixed platforms at sea or in port, or against any one of their passengers or personnel, against coastal” (info@iasscore.in, n.d.). Maritime terrorism can possess a serious danger to the IO. Merchant vessel carrying toxic material or inflammable would be a potential improvised bomb for the terrorist at sea or harbor. Hence the factor of terrorism is a great threat to the maritime security. It’s a well-known fact that the terrorist attack on the supply route of a country is a main drawback to that world economy as maritime silk route will be great economical push in maritime environment. The incident took place in April 2020, that 05 boats were blown up due to incendiary bomb explosion which ISIS claimed that the first ever attack in Maldives and responsibility for explosion has been taken by extremists group linked(Acton, 2020). Similar nature incidents in other areas also cannot be ruled out.

Maritime Piracy. Piracy is a serious problem possessing threat to vessels, crew and even economies of the affected country. Piracy in the Gulf of Aden, Horn of Africa and Strait of Malacca has presented a major transnational threat in the region. Statistics has brought to the notice that the pirate attacks, which had been rising for years, dropped and declined during past years due to the reasons of multinational and independent naval task forces working in the affected areas. However, as per the international

maritime bureau, piracy and armed robbery map of 2019 shows that piracy incident in IOR in 2019 has been almost diminished compared to 2018 (www.icc-ccs.org, 2019). Adoption of best-management practices by ships and the use of on board security team have also helped to decrease activities. Somehow it is noteworthy to mention that the piracy incident in the areas of Malacca strait is still existing in different levels even though the effort of mutual agreement like Regional Cooperation agreement on Combating Piracy and Armed Robbery against Ships in Asia (ReCAAP) make their mechanism to combat at their best (www.recaap.org, 2020).

Human Trafficking. The smuggling of humans is truly a global concern, with a number of countries affected by as it has origin, transit and destination point. Assessing the real size of this crime is complex in nature, owing to its underground activities and the difficulty of identifying when irregular migration is being facilitated by smugglers. Smugglers take advantage of the large number of people willing to take risks in search of a better life when they cannot access legal channels of migration. This may be for themselves or for their families, and it may involve searching for work or escaping from poverty, natural disasters, violence, armed conflict or harassment. Smuggled migrants are vulnerable to their lives are often put at risk: they may choke in containers, or drown at sea while being smuggled by profit-seeking criminals. The level of safety and ease of reaching the destination are dependent on the amount of money paid. Smuggling routes can be affected by long by-passes and last-minute changes in the itinerary to take advantage of monitoring by maritime forces and border controls. As per United Nations office on drugs and crimes report in 2018 on “Migrant Smuggling in Asia and Pacific, Current Trend and Challengers” specified in detailed with figures from 2012 to 2018, how the illegal human migration took place from south Asian countries to other destinations (www.unodc.org, 2018).

Drug Trafficking. Drug trafficking is an illegal trade that happens in the global black market and finds main network distribution system through the sea. Drugs are transferred by a ship secretly and disembarked at the

final destinations or hidden under other cargo and reach final destination through few transit ports. For this purpose, drug dealers use fishing vessels when close to land. SL is vulnerable as a transit for these illicit drugs and is particularly affected by the trafficking of cannabis and heroin. Sri Lankan customs have seized six shipments of high-purity South American cocaine which Asia's largest-ever haul of the drug in December 2017 (Aneez, 2017). On the other hand, the 'Golden Crescent' and the 'Golden Triangle' are the two Asian principal areas where illicit opium production takes place covering the area of central, south and western Asia. Further to that, the east African coast plays significant role in the global heroin trade. Sea routes of eastern African towards open sea areas (known as southern route) are very much famous to illicit drug trade as policing and monitoring of these networks are very less and almost blind.

Illegal, Unreported and Unregulated Fishing (IUU). Fishing by domestic or foreign vessels in waters without obtaining required license or without being reported, without being considered for international laws and conventions or local regulations called IUU fishing. IUU fishing is ever threatening activity of which affects to the country's economy, ecology and social environment that use the sea as livelihood. This situation has left SL offshore fishing resources vulnerable generating major economic losses to the country. IUU fishing has proven even more problematic for fisheries that straddle the EEZ and coastal waters. In this problem, SL has to tackle this matter in two folders as IUU in EEZ by foreign fishing trawlers and poaching by Indian fishing trawlers in northern sea of SL. As per the characteristics of illegal fishing activities by Indian fishermen in Sri Lankan waters are identified as a non-traditional security threat to the national security of Sri Lanka. In the elaboration of the nature of this act, it revealed that this illegal act has considerable influence on political, economic, security, environmental in the context of national security of Sri Lanka. Failure of proper monitoring system is a drawback where millions worth of marine harvest taking away by others.

Asymmetric Competencies of Sri Lankan Navy (SLN). SLN is a battle-hardened cohesive maritime force which has been involved in active combat operations to be reckoned with in the IO with a lot of experiences, even though yet to be equipped with air and underwater capability. The experience undoubtedly gives the edge in predicting the future battlespace, particularly in the littorals and of the asymmetric nature. The SLN has a number of Advanced Offshore Patrol Vessels capable of operating into the deep waters to safeguard the maritime interests to a certain extent. Her small boat operation capabilities and tactics in asymmetric nature has immensely benefited during conflicts against LTTE. SLN has expanded timely with right sizing and appropriately satisfy with her commitments as per job oriented nature with time bound and thereby was able to conduct the broad range of maritime defence and security tasked mandate. However, successful delivery of tasks requires a wide spectrum of capabilities provided mainly by a fleet of effective ships with required technology on board.

During the war with LTTE sea tigers, it was always comparison and competition with adversaries that maintained the posture and the potentiality against each other. The small ceremonial navy has become a pretty good unit to suite the threats by LTTE in the beginning of 21st century and which managed to eradicate LTTE sea tigers. As Admiral (Retd) Jayanath Colombage has mentioned in his book “during most parts of the conflict, the sea tigers exercised initiative better than the SLN. The SLN most of the time were reacting to the tactics employed by the sea tigers. SLN took a considerably long time to realize that they were only reacting and their defensive tactics gave the sea tigers the upper hand at sea” (Colombage, 2016, p. 62) . It is necessary to understand how best technology assisted to practice asymmetric in war. When a civil war starts in SL, responsibility of protecting first line of defence of the island nation was the key factor. It was an obligation of SLN to protect SLOCs and control of the sea. During this time, due to the limited capabilities with low technological assets, SLN was always at disadvantage, whereas LTTE sea tigers were at advantage when they were carrying out asymmetric nature

attacks in the dark hours. It was the time where SLN decided to improve her capability to suite with LTTE asymmetric tactics which resulted in purchasing of modern equipment with automated systems especially for the navy's prime fighting force, Fast Attack Crafts (FAC). AW chapter began in the SLN in last decade of 20th century, as 1990-2000 duration was crucial for navy ships and crafts to fight against LTTE sea tiger's suicide boats with characteristics of small, low profile, highly maneuverable and adaptable for the assigned task. However, SLN adopted her own innovations and initiatives against LTTE asymmetric capabilities which were very much succeeded against LTTE asymmetric warfighting strategy and SLN became the pioneers of the field until the complete destruction of entire LTTE naval wing. Former Commander of the Navy Vice Admiral Jayanath Colombage during the Jane's Defence Weekly Interview in 2014 mentioned that "We want to retain this hard-earned capability and expertise, many navies, and especially Special Forces, have expressed the desire to learn small boat tactics and asymmetric warfare operations and the SLN is positively accommodating these requests. The SLN is determined not to allow our coast or sea to be exploited by subversive or insurgent elements in the future" (www.sinhalanet, 2014).

Sea Power by Admiral A.T. Mahan. "The Influence of Sea Power Upon History" a book written by Admiral Alfred Thayer Mahan, more than 100 years back has elaborated the 'sea power' in broad sense that which included not only military strength but also peaceful commerce and shipping (A.T.Mahan, no date, p. 26) . Admiral Mahan has enumerated six principle conditions that affecting the sea power of a nation as, geographical position, physical conformations, extent of territory, and number of population, character of the people and character of the government including national institutions (Mahan A. p. 26). Sea power is the ability of a nation to exploit the oceans to its advantage. It is the ability to exploit the oceans commercially whilst maintaining safety and security. The strength to protect this ability against adversaries is a mandatory requirement and a function of a maritime nation at various levels with different strategies.

Research Methodology

This paper examined on asymmetric warfare at sea with special emphasis on non-traditional security threats and maritime strategy of SLN. During the process of examining two questions have been addressed to reach conclusion.

- What are the threats to maritime security in IO and impact on maritime environment?
- What strategy should be adopted by SLN to deal with maritime security threats in SLN maritime domain?

Inductive approach selected with observation of the data to derive the theory under qualitative method. Data collected mostly from secondary sources through the journal articles, books and paper presented by scholars at the conferences/seminars/symposiums supplemented by internet searches online. Since the study has direct connection with SLN, I have selected SLN officers to conduct interview. Non probability sampling methods were used with purposive sampling to choose

members for the interview focused on judgment on personal perspectives, subject knowledge and naval experience and present NHQ appointment. Structured questionnaire interviews and semi structured interview prepared with open ended questions were used extensively to collect the data, as subject matter was vast and need to be discussed broadly. This paper attempted to provide understanding the asymmetric nature NTS threats and challengers in maritime domain of SL. Paper, tried to identify and elaborate maritime strategy with the application of SLN capabilities. This research did not evolve a new theory or a new exploratory modal of maritime security strategy of SLN, but the outcome, however can be effectively utilized by SLN in future.

Discussion

Maritime Security Responsibility. As the third largest water body in the world, IO containing vital sea lanes which assist countries in the region to develop with major economic ambitions. The sea lanes in the IO area are considered to be very important for world sea borne trade and energy transit through those sea routes which passes most vital and strategically important locations as marine geography highlights the importance of choke points. Securing of SLOC are vital as they are crucial for trade, energy security and thus economy as a whole. Having multiple demands for energy in the present context, mainly China, Japan, Australia and India are sensitive to the security of SLOCs and choke points of the region. Sri Lanka's geographic location in maritime security aspect is very much important at this juncture as it has located right center of IO with greater advantage of close proximity to SLOCs making influence on maritime security. Threats to maritime good order like maritime terrorism piracy, gunrunning, human smuggling, drug trafficking, IUU fishing and sea pollutions are the key areas of which SL needs to keep her eye open. Eruption of crisis in her maritime domain can lead to massive disruption in the trade and energy flow and such scenario will badly affect the country as noncompliance of her responsibility in maritime security by the world.

SLN maritime strategy to respond to maritime security threats at sea are to be focused on asymmetric in nature. Battle-hardened and asymmetrically capable maritime force is a requirement at present and in future, compared to different type of asymmetric nature threats posed by state as well as non-state actors with improved technological systems. Competitive technologies such as integrated weapon systems, information warfare systems, surveillance capabilities and reconnaissance are to be the main focus for country like SL. Lack of resources in terms of quantity and quality are huge draw back and always challenging. Maritime security in IOR is a prime focus of SLN and it should be embedded in the mindset and operating philosophy of ensuring peace and security at sea, mitigating all security threats by performing with its highest possible capacity. As leading

maritime security organization, SLN needs to provide wider and broader security assistance to all stake holders in coordination with government and non-government organizations and institutions with comprehensive, inclusive, participatory and collaborative maritime security strategy.

Trans-national crime has earned an unprecedented dynamic situation worldwide and it has reached every corner of the globe due to globalization environment. Crime has become transnational when it is committed in more than one state (drug trafficking, human smuggling) or plan in one state and committed in another (terrorist attack) or even when it is committed in one state but seriously impact on other states (piracy, IUU). It has become an extremely serious security threat to law enforcement agencies of the states, challenging international, regional and national security in present day world order. Modern technological advancement including communication systems and 'ease of doing business' environment in which trans-national crime have expanded their operations in large scale and enhanced business and deals in much more diversified and collaborative manner giving more deterrent on security forces under challenging security environment. In recognition of emerging threat scenario and the trends of NTS, SL being an Island nation, has much opportunities for the mitigation effects than the landlocked country subjected to better mechanism. Suppression of such activities requires new strategic approach with better cooperation and coordination with other agencies, organizations in local, regional and international levels.

Conclusion

Security architecture of the IOR is vital as asymmetric nature traditional and non-traditional threats by state as well as non-state actors has emerged during past few decades which changed the security of maritime domain drastically. On the other hand, power rivalry among maritime nations and the competition by regional and extra regional powers on the ocean with tremendous sea control efforts has become unstable maritime security situation. In that sense, attainment of maritime security and stability is

very much of significance to achieve secure seas. The increased numbers of illegal occurrences out at sea are at the highest level at present. Active pirate incidents, direct and transit human trafficking, highly motivate drug trafficking network keeping SL as one of the transit points off the seas of SL, IUU fishing by Indian fishermen in northern Sri Lankan waters and IUU fishing activities in EEZ which is mostly unknown due to maritime blindness. In the context of asymmetric nature, SLN should have consent of prudent approach utilizing her maritime powers with better cooperation and partnership with other stake holders to face the present and future challenges. It is a known fact that synergy of efforts, both internally and externally is a key to mitigate the hassle of maritime disputes, threats as no incident in maritime domain remain isolated. Hence, attention is needed for the possible solutions to mitigate all form of violent and non-violent maritime security issues in maritime domain of SL with military and non-military contribution with the commitment of more financial contribution with the attention for short, medium and long term strategic plans.

Due to the changing dynamics of IO, country's policies and maritime mind-set is also changing time to time. The concept of territorial to non-territorial model due to economic development strategy rather than the consent of peace and security have created a big query for the nations who have connection and association with IO region. The evolving geopolitics of the IO region with the power projection by India being the big power in the region and China's influence on IO through its client states such as Pakistan, Sri Lanka, Myanmar and Bangladesh with its maritime silk route initiatives have created real time maritime security challengers among nations. This situation has created to think towards a new dimension on SL maritime strategy in cooperation with her national security and prosperity. At a national level, understanding the capacity to provide maritime security including arrangement for coordinating between countries with better foreign policy on maritime security and the in cooperation of both local and international maritime agencies to enhance the operational capabilities is of paramount of important. It is mainly an attribute of SLN to deal with maritime security governance especially the combat in

the littorals. Maritime security and the law of the sea examine the rights and duties of state across a broad spectrum of maritime security threats. It provides a comprehensive coverage of maritime security strategy at sea with different dimensions, which provides how best a country should respond to such threats by means of military and non-military activities.

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FIGHTING BEING OUTNUMBERED: CHALLENGES AND OPTIONS FOR BANGLADESH ARMY

Colonel Md Ehsanul Haque, SUP (BAR), afwc, psc, PhD

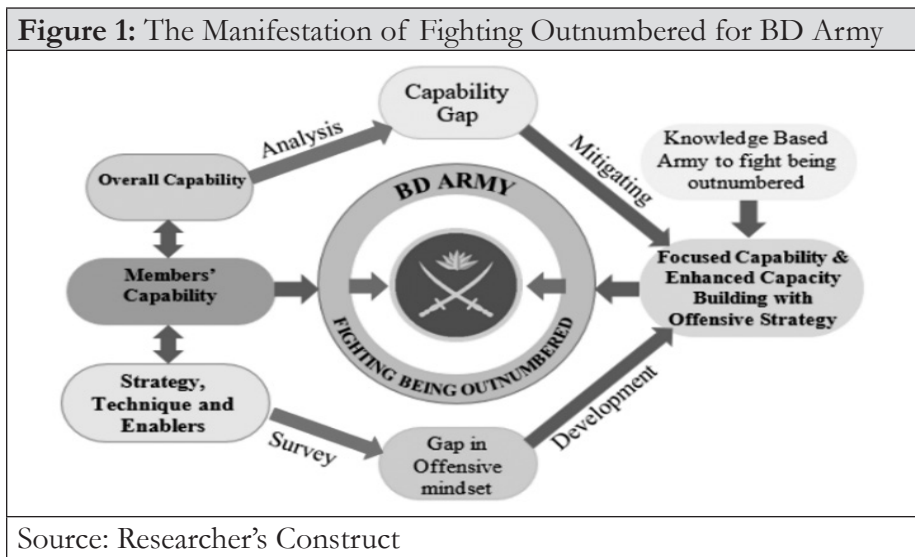
Introduction

Operational Environment at global, regional, and internal domains have direct and indirect impacts on the security of Bangladesh (BD). In response to the global commitment to peace, BD Army needs to maintain an effective force for operating in diverse situations. From a regional perspective, a good number of complex issues exist where some issues pose direct threats and few provide opportunities to BD. Geopolitical differences among South Asian countries have remained an area of unsolved and perilous conflict involving external powers, arms race and ethnic and religious animosity that go back to the evolution of India, Afghanistan, Bangladesh, Bhutan, India, Nepal, Pakistan, and Sri Lanka - the countries that form South Asia (Jahan, 2015, p.5). The evolving security situation demands a credible military force for BD. Consequently, BD Army needs to possess the capabilities to deter and defeat any potential threat arising in the future. In maintaining territorial integrity of the country and defeating any venture by the adversaries, BD Army must fight to win.

BD Army also needs to grow the capability of balancing Physical, Morale and Conceptual components in fighting adversaries with numerical superiority. The reality in fighting outnumbered involves predominantly the security forces. Since these operations are markedly diverse from conventional operations, BD must prepare in advance by adopting suitable tactics, techniques, training and doctrines based on anticipated operational environments. Based on the context stated above, war planners need to be able to comprehend and adapt to the D-VUCAD (disrupted, volatile, uncertain, complex, ambiguous and diverse) environment. Novel ideas

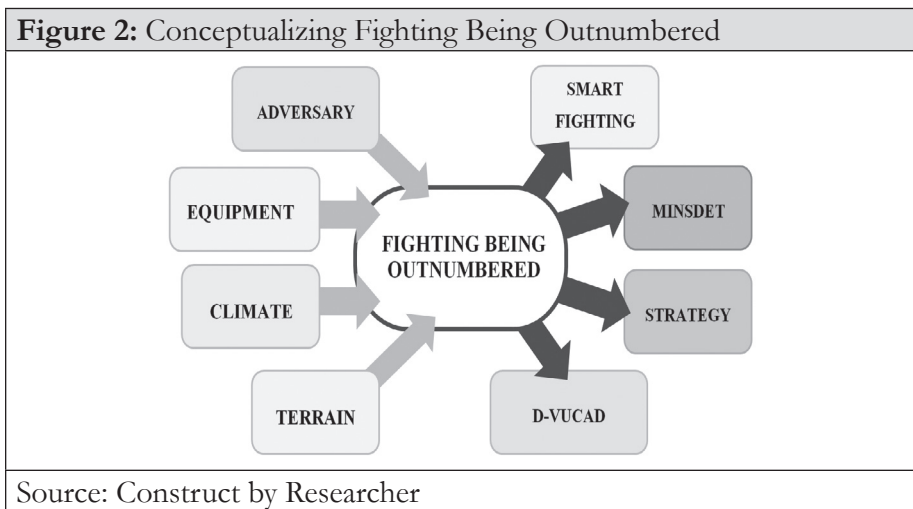
and innovative techniques can thwart the aggression of any stronger force. Techniques of beating superior opponents have become an important area of contemporary studies. On this pretext, BD ought to fight smartly for winning the land battle by concept-led and capability-based approach timed with continuous improvement. Keeping such challenges and functional opportunities of BD Army in view, this research attempts to find out suitable strategies for BD to fight being outnumbered.

The edge of BD’s physical component is relatively frailer to the armies of her neighbours. However, the Defence Policy of Bangladesh-2018 denotes that BD Armed Forces have to “establish a firm defensive posture convertible to the offensive” according to the situation. As such, fighting against superior adversaries needs an adaptive organization comprising regular and irregular forces along with suitable aggressive means to defeat an adversary. Taking these points into cognizance, while maintaining a defensive posture, BD Army has to strive for suitable strategies for situational transformation to offensive. However, presently BD Army is yet to be equipped with corresponding strategies in responding against impulsive threats that might be wreaked in an outnumber scenario as shown in Figure 1.



Conceptualising of Fighting Being Outnumbered

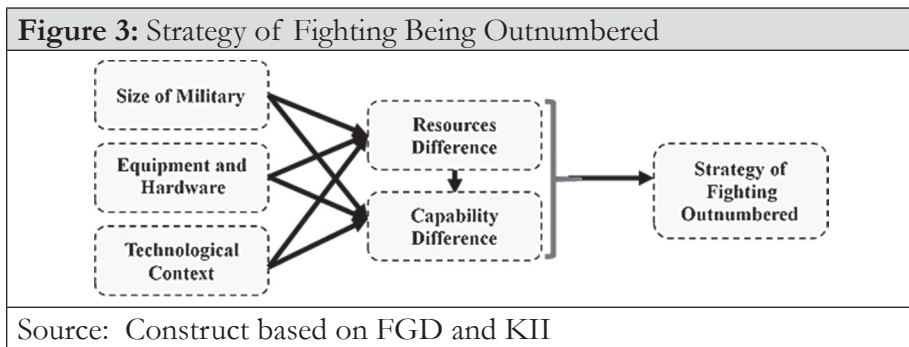
The key concept of fighting being outnumbered is to fight a superior force and win bravely (Lavarino, 2016). This term is yet to be incorporated in the military vocabulary even oriented from the ancient period. However, Modern tactics adopted a number of concepts in line with this idea. General William E. DePuy and then Major General Donn Starry conceptualized the term ‘Active Defence’ in 1970. The most significant characteristic of the doctrine is to fight being outnumbered and win (Lavarino, 2016). Officially the U.S. Army assumed Active Defence as a doctrine in 1976 (Bronfeld & Bronfeld, 2018). Another concept, “Air-Land Battle 2000,” was received by the US congress after years of deliberate study. To fight the Soviet Union’s superior force, the concept emphasizes communications, mobility, and coordination. The smaller units fight independently to be part of the plan orchestrated (Starry, 2017). Figure 2 shows the Concept of Fighting Being Outnumbered.



Strategy for Fighting Being Outnumbered

Strategy is considered as the General’s domain of planning a war, which is one of the important maxims of Sun Tzu. This is, at times, termed as

grand strategy’ (JOSW, 2019). Sun Tzu said, “Strategy without tactics is the slowest route to victory. Tactics without strategy is the noise before defeat”. In the 21st century, a smaller or inferior country should plan for fighting being outnumbered, which will bleed potential adversaries extensively and cost him more. The strategy to fight being outnumbered is to conserve strength and hit the enemy at an opportune moment wherever possible as shown in Figure 3:

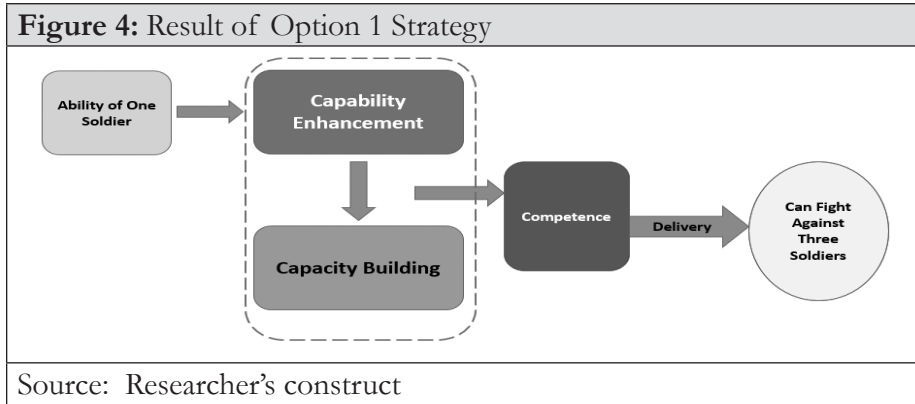


Options for Fighting Being Outnumbered

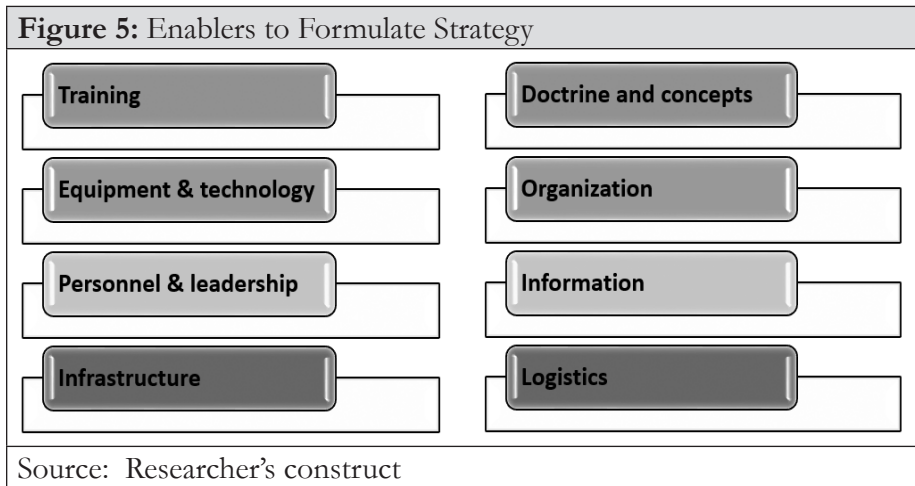
The study found options ranging from creating an organizational culture to promoting capacity building and creative ideas. Capacity Building is a crucial, non-kinetic process for sustaining operational success. The innovative thoughts should be able to travel through an appropriate channel. In the process, the efforts of all military personnel can be integrated with tools, skills, structures, systems, and roles of the organization. The formulation of strategy would follow the traditional sequence of ends, ways, and means.

Option 1. Capability Enhancement and Capacity Building: BD Should Improve Intelligence Capabilities to Have Comprehensive Knowledge of Enemy. Capability enhancement and capacity building are processes by which individual military personnel and Army obtain, improve, and retain the skills, knowledge, tools, equipment, and other resources needed to fight outnumbered. It allows individual soldier and Army to perform at a greater capacity. In the army, one soldier or an

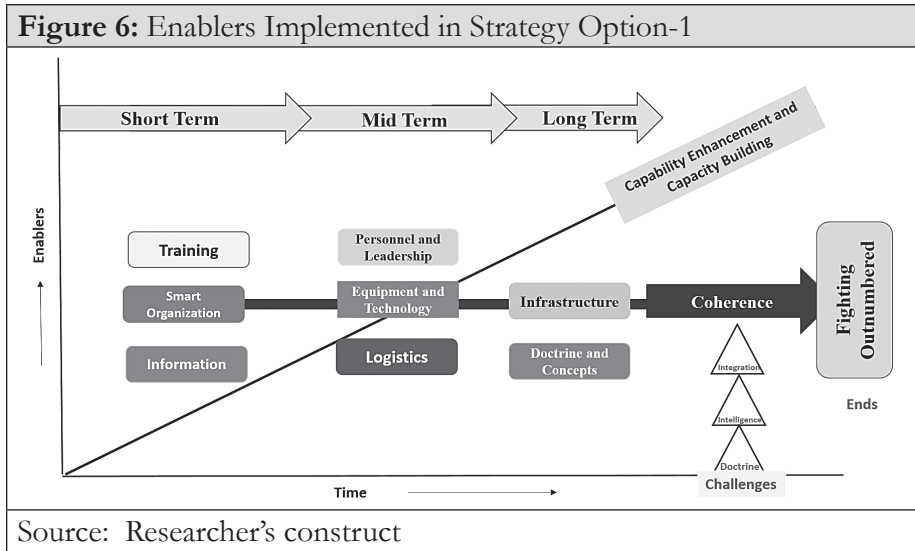
individual must be able to fight and defeat three soldiers after capability enhancement and capacity building as shown in Figure 4:



The roadmaps and related facilities represent the building blocks for the development of capability, and the blocks can be articulated by the acronym TEPID-OIL, as explained in the following Figure 5:



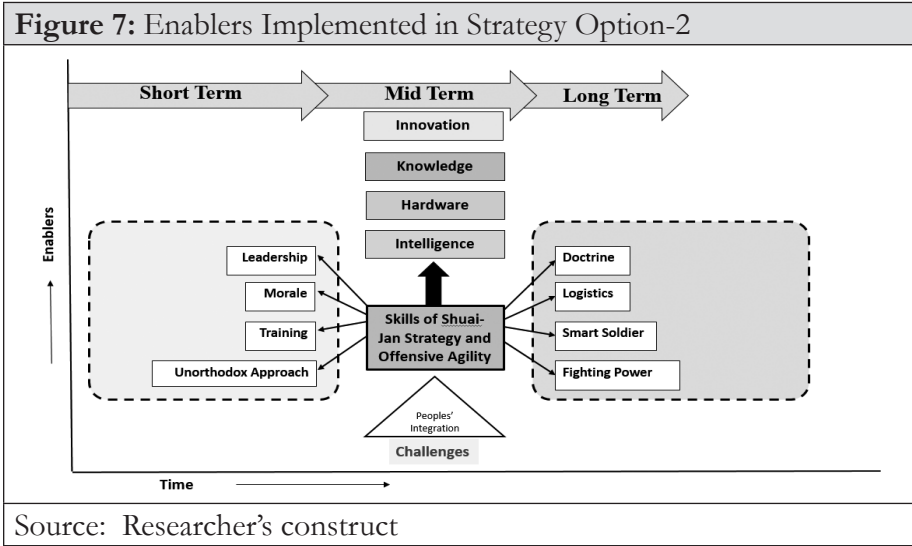
BD Army can complement national effort and remain committed to secure matters related to national security to fight outnumbered by adopting option 1. This is a whole-system viewpoint taking an integrated method to deliver all of the apparatuses of military capability as follows. Figure 6 is shown below:



Option 2. Skills of Shuai-Jan Strategy and Offensive Agility. Shuai-jan is a snake found in the Chung Mountains. The snake when attacked at its head pounces against the attacker by its tail, if struck at its tail then attacks by its head, and when assaulted at its middle section then it attacks by its head and tail both.

There is a saying that offence is the best defence. This strategy is being followed by Israel having minimal geographical and demographic depth while being surrounded by adversaries. A similar situation is prevailing in the case of BD. Thus, BD Armed Forces should develop an offensive psyche to offset the enemy's plan of launching any offensive strategy/measure. This strategy must integrate Shuai-Jan into the offensive agility and be materialized as per Figure 7:

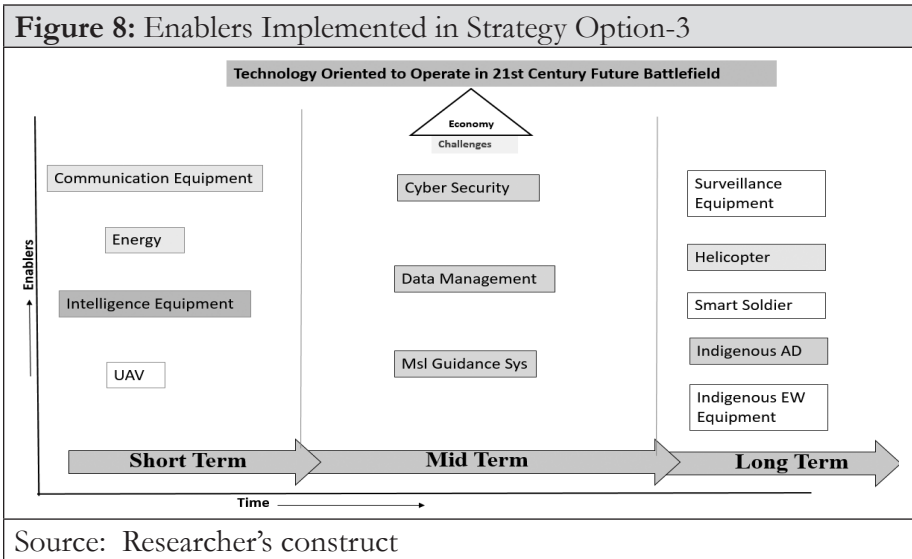
Figure 7: Enablers Implemented in Strategy Option-2



Source: Researcher's construct

Option 3. Technology Oriented Force to Operate in the 21st Century Future Battlefield. The future operational environment in the 21st century is likely to be complex and challenging and will be dominated by technology due to the advent of the lethal and precision-guided weapon system, cyber and EW, unmanned vehicles, AI, social media, nanotechnology, etc as per Figure 8 shown below:

Figure 8: Enablers Implemented in Strategy Option-3



Source: Researcher's construct

Analysis of Suggested Options

Suggested options were objectively analyzed against a few key questions to determine the preferred model for BD Army. The findings are tabulated as follows:

Table 1: Analysis of Suggested Options			
Question to Consider	Option 1 Capacity Building	Option 2 Shuai-Jan Strategy	Option 3 Technology Oriented Force
What could be the easiest option to implement?	Easy	Easier	Hard
What could be the budgetary implications to accomplish?	Medium	Low	Most
What would be a prospect in technological development?	High	Medium	Highest
What are the requirements of specialist resources?	Medium	Low	High
What is the requirement of additional manpower and resources?	Medium	Low	Low
How is the challenge to implement?	Less	Medium	More
How much deterrence can be created?	Medium	More	Medium
Source: Survey Data			

In the survey, the highest 30% of respondents opined for Option 1 while 40% opined for a mixed strategy of option 1 and 2 that would be best to

formulate the strategy of fighting being outnumbered.

Preferred Option. Focused Capability and Enhanced Capacity Building with Offensive Shuai- Jan Strategy. The model would necessitate a focused capacity enhancement and Shuai-Jan strategy incorporating the tactics, techniques and procedures for fighting being outnumbered as shown in Figure 3-10. Offensive spirit, as a principle, has predominant relations with the other four principles of war of the Bangladesh Army (Figure 2). The offensive spirit of the commanders would be instrumental in adopting audacious and bold courses of action to appear in an unexpected direction.

Finding Suitable Enablers. Indigenous techniques can have a multiplying effect. Moral and conceptual components are intangibles where BD Army can achieve by innovative means and leadership. Enemy's vulnerability increases if the physical components or enabling capacities are targeted.

Analysis of Probability of Success

The probability of success (POS) is a statistical perception frequently used to support decision-making. The concept is closely related to conditional power and predictive power. Conditional power considers the effect parameter to be a random variable.

As discussed, each of the enablers is a discrete random variable, we may envisage the probability (P) of each enabler which contributes to winning the war. The properties of the probability are set as $0 \leq P \leq 1$; $P=0$ means it is impossible to win with this enabler alone; while $P=1$ assures winning with this enabler alone. Based on the results from the survey, the probability distribution of each enabler is given in Table 2:

Table 2: Distribution of Weightage among the Enablers to Evaluate Overall Success Probability

Enablers (From paragraph 3.3.2)	Respondents Strongly Agreed (%)	Converted Weightage for Success	Probability distribution (P)
Training	48.5	11	0.11
Equipment and Technology	61	14	0.14
Personnel and Leadership	60	14	0.14
Infrastructure	47	11	0.11
Doctrine and Concepts	55	13	0.13
Organization	54	12	0.12
Information	58	13	0.13
Logistics	53	12	0.12
Overall Outcome (win)	-	100	1

Thereafter, the ratio of each enabler between Country X and Country Y is taken as:

$[Y / (X+ Y)]$. For deriving the model, a fictional sample is charted as follows:

Table 3: Imaginary Ratio of Each Enabler between Opponents

Enablers	X Country	Y Country	Total
Training	0.7	0.3	1
Equipment and Technology	0.3	0.7	1
Personnel and Leadership	0.3	0.7	1
Infrastructure	0.7	0.3	1
Doctrine and Concepts	0.3	0.7	1
Organization	0.7	0.3	1
Information	0.3	0.7	1
Logistics	0.7	0.3	1
Outcome (Win/Lose)	0.484	0.516	1

Here, the expected Outcome for any force winning the war has been calculated as:

$$\begin{aligned}
 E(X) &= \sum \{x_i \cdot P(x_i)\} \\
 &= \sum \{\text{Enabler } i \times P(\text{enabler } i)\} \\
 \Sigma (x_i \times P(x_i)) &= \{x_1 \times P(x_1)\} + \{x_2 \times P(x_2)\} + \{x_3 \times P(x_3)\} + \dots
 \end{aligned}$$

Thus, success probability of X Country (assumptions based on Table 4-1 and 4-2):

$$\begin{aligned}
 E(X) &= \{x_1 \times P(x_1)\} + \{x_2 \times P(x_2)\} + \{x_3 \times P(x_3)\} \dots \\
 &= 0.484 \approx 48.4\%
 \end{aligned}$$

And the success probability of Y Country (with same assumptions):

$$\begin{aligned}
 E(X) &= \{x_1 \times P(x_1)\} + \{x_2 \times P(x_2)\} + \{x_3 \times P(x_3)\} \\
 &= 0.516 \approx 51.6\%
 \end{aligned}$$

For India and BD, the model can be set for trial with a varied weightage of the enablers. It will give a consistent result while the outcome can be manipulated by the enablers' ratio. Different scenarios will be tested based on the capabilities of the belligerents in subsequent paragraphs.

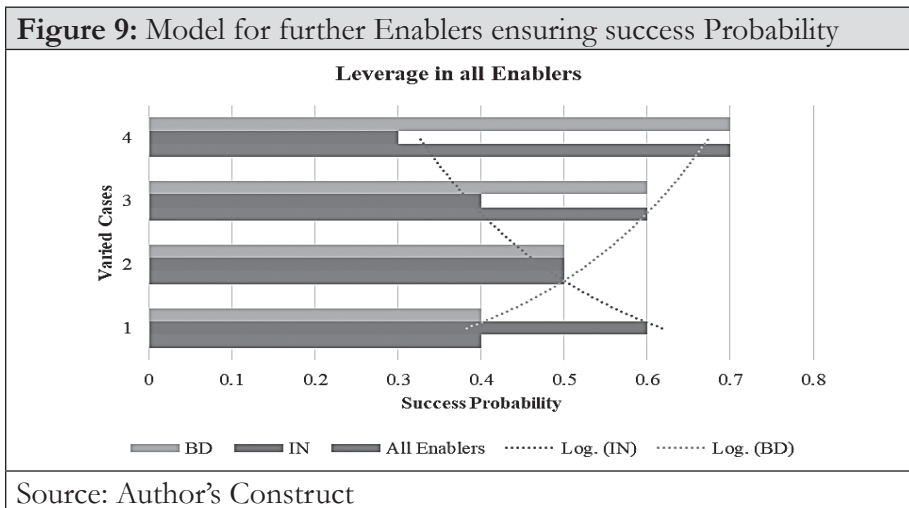
The Architecture of a Mathematical Model. In this chapter, a model has been prepared to generate a quantifiable output for interpretation as a probability of success. The enablers were set as criteria for winning a war. In order to put the enablers into perspective and evaluate their combined employment against an adversary, a linear programming method has been used to derive the probability of success. An empirical baseline has been set for their relative probability towards success or failure as shown in Table: 4 and which can be taken for future study:

Table 4: Ratio between the Enablers between X and Y country

Enablers	X Country	Y Country	Total
Training	A	1-A	1
Equipment and Technology	B	1-B	1
Personnel and Leadership	C	1-C	1
Infrastructure	D	1-D	1
Doctrine and Concepts	E	1-E	1
Organization	F	1-F	1
Information	G	1-G	1
Logistics	H	1-H	1
Outcome (Win/Lose)	M(say)	1-M	1

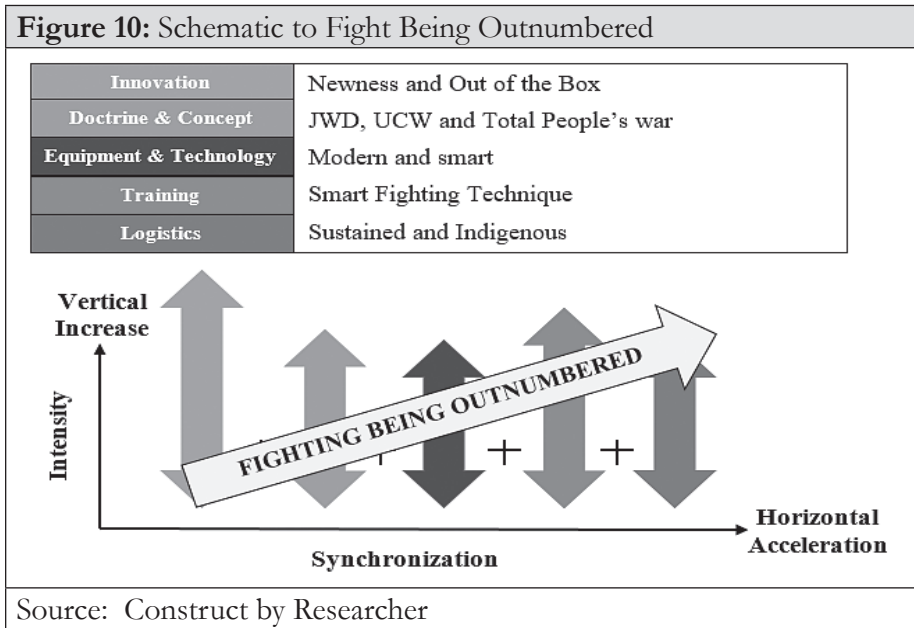
Source: Author's Construct

Probability of Success through Enablers. It may be executed through planning, synchronizing, and employing enablers as shown in Figure: 14 in such a manner that would have a significant effect to enhance the offensive posture. The model may be further examined to fight outnumbered would be helpful in future. The war fighting strategy needs to be prepared following the defence strategy enumerated in the defence policy 2018. Finally, enablers should prepare functional doctrine relevant to military strategy which contributed to the probability of success.



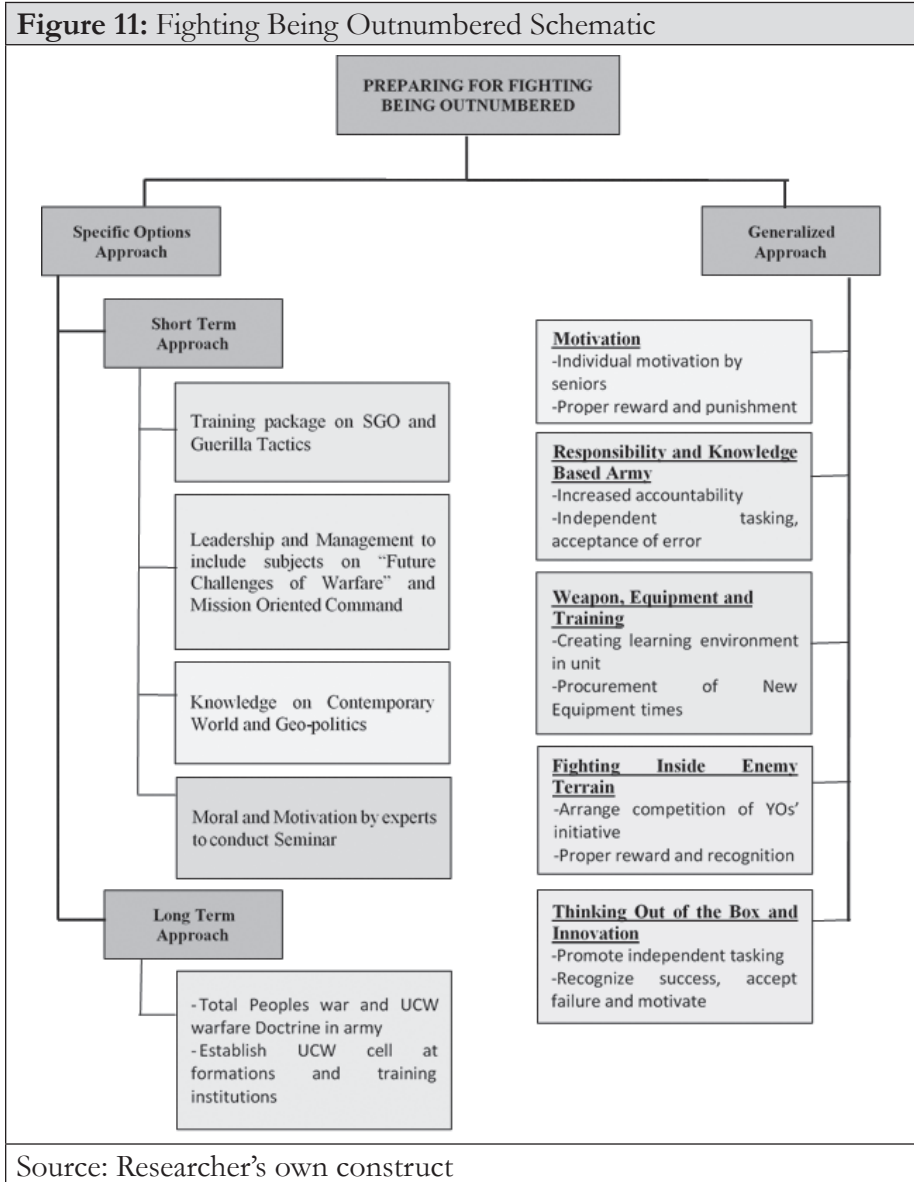
Roadmap of Army to Fight Being Outnumbered

In this regard, the scope for innovative ideas from individual, training institutions and formations should be kept open. This should be a continuous process. Besides, all enablers should be synchronized in such a way that it may have enough scope to fight outnumbered as shown in Figure 10:



The weapon system needs to be updated and upgraded, considering the doctrine and forces planned. The training system should be so designed so that it not only adheres to doctrine but also accommodates and promotes innovation at all levels as in Figure:11.

Figure 11: Fighting Being Outnumbered Schematic



Source: Researcher's own construct

The Blueprint for Implementation of Fighting Being Outnumbered

Encourage Newness and Innovation. The present doctrine of blending conventional and UCW will have to be revisited taking innovative ideas from individuals, institutions and formations and above all, taking the lessons and spirit from 1971. Thereafter, ARTDOC may formulate a doctrine of 'Fighting Outnumbered' by 2022.

Modernizing Weapon and Armament. The weapon and armament system would be revised as per the new doctrine by 2025 under the Master General of Ordnance Branch. Defence procurement has to be planned ahead to carry out the same accordingly.

Fight Outnumbered Jointly. In this connection, revision of existing doctrines and weapon systems of BD Navy and Air Force can be done by Armed Forces Division to fight outnumbered jointly. The further endeavour should be taken to revise the Joint Warfare Doctrine according to all the revised doctrines and weapon systems by 2027.

Learning Outnumbered from BD Military Academy (BMA) to All Training Institutions. Based on the findings of the research, it is felt that a realistic approach should encompass the individualistic measures as well to revamp the operational mindset. The idea must be generated from BMA and taught in each training institution of BD Army to fight being outnumbered.

Averseness to Education and Inclination to Training. A culture of Warrior-Scholar will be pursued to stress upon the study of the profession as per arms. A list of books and journals would be incorporated in the syllabus of training institutes. The culture of Book Review has to be institutionalized at formation level.

Culture of Operations and Create Forums for all Ranks. How we operate, influences our thinking. The military during operations follows a very top-down approach, which by itself impedes thoughts at the lower

tiers. All officers must try to allow all ranks to hear and share about various aspects of fighting being outnumbered to develop thinking ability and growth mindset.

Recommendations

Division/Brigade Level Pilot Project. Some pilot projects would be worth studying the feasibility of the application of enablers. The transformation should be gradual with modification taking gradual effect over the traditional approach (Pilot Project).

Frequent Arrangement of Exercises/War-games. On the formulation of Draft Doctrine by ARTDOC, Military Training Directorate may issue directives to implement the new doctrine involving the local population through training packages, exercises and war-games. Reviews need to be sought in finding the gaps/ shortfalls in Key Enablers and assess scopes for further development by 2023 (Validating the Enablers).

Aiming Before Arming. Based on the reviews, Vision 2041 may be set in line with the doctrine of fighting outnumbered. General Staff Branch needs to take the lead role in this aspect (Vision Option).

Conclusion

Since the War of Liberation, BD has undergone significant transformation in different dimensions. The ascertained factors that led to the weak forces in winning war were applied in a different context than that of the prevailing or projected condition of BD. Weak forces adopted different war fighting techniques to make the war costly for the strong adversary through protracted war and conserving fighting spirit. Detail analysis revealed that the basic techniques and the idea behind them have relevance in BD context. Nevertheless, on many occasions, necessary modification is required before applying that in BD caveat.

Considering the cost-risk-benefit, a suggested roadmap was proven to enhance our capabilities to face any strong adversary in future. The study has identified a set of enablers from the selected strategies as a prerequisite for an outnumbered force. It was found that physical spiritual dimensions are equally important to win a war by focusing on capability and capacity building. The enablers also include the novel idea of continuously evaluating unorthodox approaches and looking for the essence and spirit to validate, update and strengthen own doctrine would qualify BD Army to be a relevant and deterrent force regionally and globally.

BD Army is a professional one and is well aware of the opponent against whom it steps to launch a war. Thus, apart from strategic standpoint, strong motivation, morale and courage are must for introducing the new doctrine 'fighting being outnumbered'. On some occasions, being outnumbered force has won against big aggressors simply by virtue of displaying tremendous morale and motivation. An Army being outnumbered can bring success in war if it becomes the reason of economic threat of a superior Army. This study is not articulating any adverse ideas of increasing military power, rather insisting for the development of strategies which will focus on enablers (TEPID-OIL) to fight against a superior adversary being outnumbered. The success probability of BD Army will develop gradually through fostering the enablers to fight being outnumbered.

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VIRTUAL TRAINING PLATFORM WITH VIRTUAL REALITY AND AUGMENTED REALITY FOR PEACE TIME TRAINING: A FEASIBILITY STUDY FOR BANGLADESH ARMY

Lieutenant Colonel Md Khalid Saifullah, afwc, psc, Sigs

Introduction

The technological revolution has generated multi-dimensional opportunities for training in the military domain. Throughout the pedagogy of military training and education, there is a paradigm change where Virtual Training Platform (VTP) with Virtual Reality (VR) and Augmented Reality (AR) is given special emphasis and importance in conjunction with traditional inhabited training. Worldwide armies actively recognized the potentials of VTP with VR and to deal with the evolving training demands. Virtual training implies training conducted in a virtual or simulated environment. VTP is designed to replicate the conventional training module or direct ways of learning in concurrence with virtual training contexts. The VR environment is stated as an interactive artificial simulations platform allowing users to immerse and simulate an environment and the senses experience a physical reality. AR is characterized as a technology that overlays the actual world with virtual objects. AR's key advantage is its distinctive ability to create hybrid environments for immersive learning.

Bangladesh Army (BD Army) is also in the progress of providing training through digital platforms. Presently, almost all the arms and services of BD Army have a simulation training platform as part of VTP. But VTP with VR and AR is not similar to simulation training for technological differences. Imparting realistic and innovative training to the members of BD Army is always a challenge to get a holistic outcome. Demand for required training areas and the need for having maximum land for cultivation clues to a conflicting requirement in the present situation.

Therefore, it may be important to ask alternative questions: are the training needs fulfilled with the existing mode of training facilities? Could present training facilities bridge the gap in existing training constraints? Is it time to incorporate or customize the technological-based training platform facilities in BD Army?

Over the years, the training system for the BD Army has evolved to meet emerging training needs. But issues like visualizing the real-time training scenario before ground application, technology-driven progressive training platform, and so on are yet to be addressed. As the army enters the 21st century, military planners try more reliable and effective training pedagogies. The buzzword ‘training anytime and anywhere’ is now an evolving and demanding concept among many armies worldwide. Presently, most of the members of BD Army are habituated to using internet and riddled with technology. Facilitating training through Army War Game Centre (AWGC) is one of the distinct examples in this regard. To build the future workforce, training environment for them should be such where they can have interactive learning through virtual-platform and can access anytime anywhere.

Furthermore, it is desired for the BD Army to enter a digital environment following the ‘Digital Bangladesh’ target. VTP with VR and AR can be a step forward in this area. VTP is technology-intensive pedagogy. There remain however concerns as to whether VTP with VR and AR will achieve their desired performance in the current BD Army’s training setup. Therefore, the research’s problem statement was: “Potentials of VTP with VR and AR pedagogy in preparing more effective peacetime training are not ascertained in the context of BD Army”.

Review of Literature

Akçayır et al., (2016) illustrated that when used in educational settings, AR technology offers several benefits. The findings of the study reveal that AR ‘enhances learning motivation, allows students’ better understanding,

enhances positive attitude and increases satisfaction. Lee (2012) explained that AR is a technology that significantly shifts learning location and timing which will have a positive effect on education in the future. Bower et al. (2014) stated that the virtual platform can minimize cognitive fatigue by providing ‘perfectly aligned teaching scaffolding’ and by allowing students to learn in different ways. The paper delved into the use of AR in both mainstream education and pedagogical potential of technology.

Shanmugam (2019) mentioned that VR and AR are crucial in training to exploring and touching the past, the present and the future in learners’ terms. It creates a holistic virtual learning approach by creating one’s own custom-built educational and training reality. Identified challenges are also mentioned while developing such a system. Kaufmann (2018), in his research, provides a comprehensive summary of how collaborative AR can be used in education in a larger context of the immersive virtual learning world.

According to U.S. Army Training Concept: 2020-2040 (TRADOC, Pamphlet: 525-8-2, 2019), they have planned to use emerging technologies for educational purposes. Technologies involve interactive virtual training and visuospatial aiding tools to make a blended learning environment. Fulton (1989) and Lobel et al. (2002) emphasized the use of virtual training platform Correspondence-based Asynchronous and Synchronous. From the study, it becomes apparent that the IT revolution emerges a wide-ranging horizon for choosing appropriate virtual training platform to suit the users’ requirements.

Popular works by Bartley & Golek (2004) found a virtual platform (Distance Learning) as a more cost-effective option. Experts at the RAND Arroyo Center (2002) have promoted online learning as an economical option for military practice-oriented training. Race (1989) proposed ‘MIX & MATCH’ to be a suitable option for effective learning with conventional learning. The balanced mix between VTP and residential learning was also emphasized by researchers at the RAND Arroyo Center (2002).

In the context of the BD Army, VTP with VR and AR is an entirely different arena. This topic was explored in some previous studies on the IT evolution of the BD Armed Forces. Study findings regarded that learning through IT-based platforms would provide training sources more accessible to the soldiers. Study suggest VTP pedagogy for the self-inducement/persuasion of training.

Research Gap and Area Chosen for Research

All researchers have resorted to establishing the fact that the advancement in technology should be augmented through establishing a technology-based training platform. There is a great deal of scope here for more research, these are:

- Focuses specifically on the potentials of VTP with VR and AR in making the BD Army training more efficient and reliable.
- Identifies probable implementation areas for VTP.
- Provides specific guidelines for the implementation of VTP with VR and AR in BD Army based on present context.
- Examine the possibility of blending the inhabitant existing training and VTP for enhancing the training efficacy.

Methodology

Study Area and Target Population

As a whole, all the members and concerned stakeholders of BD Army were the target population of this research. SMEs of this research were the members of Training Institutions of BD Army, Army Training and Doctrine Command (ARTDOC), AWGC, Military Institute of Science and Technology (MIST) and Bangladesh Association of Software and Information Services (BASIS). Contents of different armies' best practices and related articles were studied for the purpose of this research.

Research Design

It was a non-experimental, exploratory, and applied research with a causal relation. Initially, the researcher explored a suitable implementation roadmap for adaptation of VTP with VR and AR for the enhancement of peacetime training of BD Army. The researcher then identified challenges and sought for mitigation means through data analysis and global best practices for its implementation in BD Army.

Sample Design

The sample was drawn following stratified sampling technique on convenience method to ensure representation from all strata of the population associated with training of BD Army.

Table 1: Category of Sample Population

Category of Sample Population			
	Frequency	Percent	Cumulative Percent
Officers of BD Army	78	35.94	35.94
KIIs	19	8.75	44.69
Training Institutions/ Establishments (SME)	83	38.24	82.93
JCOs and NCOs	37	17.05	100.00
Total	217	100.00	

Research Methods and Data Analysis

Both qualitative and quantitative data were collected. This research applied Non-probability Purposive data sampling technique and each sample was accessed following Cross-Sectional method.

Results

The outcome of the research was comprehensive and delineated with outlining implementation process of VTP with VR and AR. It also explored appropriate adaptation modalities for BD Army.

Aim of VTP with VR and AR in Training Arenas of BD Army

To Develop Cognitive Domain. Education and training both share the psychological constructs of learning, memory and motivation. Learning outcomes are measures of the knowledge gained from an instructional program. VTP with VR and AR focusing on key concepts of lessons understanding at self-paced can enrich one's cognitive domain. Through VTP, the trainees are expected to take responsibility for their own learning. Here instructors' (Trainers) role is mostly as facilitator. Trainees will learn virtually in a stimulating interactive environment. This will create an innovation producing learning environment for the trainees. It may increase creative thinking capability and pro-active preparation.

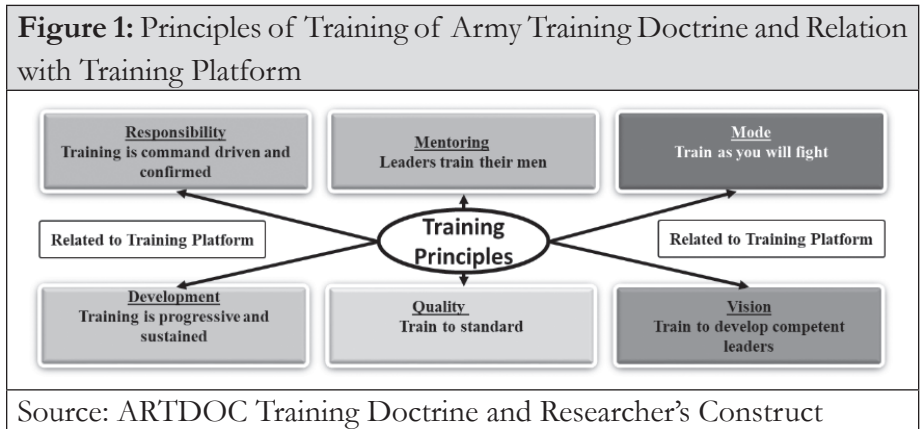
Facilitating Training Anytime and Anywhere. To take the concept of 'training whenever and wherever', the idea of 'training anytime and anywhere' has become increasingly common among armies across the globe due to the added commitments. At this juncture, military thinkers felt a paradigm shift in training pedagogy, and VTP emerged as the most viable alternative.

Expanding Access to Training and Alleviating Capacity Constraints. VTP has the greatest potential to expand access to training and mitigate capacity constraints that are of great concern to military training providers. Like, rapidly shrinking training areas and firing ranges due to exponential urbanisation and cultivation. VTP with VR and AR as interactive apps aid in engaging and linking learners. Self-actuating learning provides the highest learning experience.

Training on Demand. VTP's ability to deliver on demand instruction is one of its significant potential aids. Military planners feel constantly the need for 'just-in-time' skills training for many reasons, such as inducting new equipment and engaging in Operation Other Than War (OOTW). This allows training providers to deliver instruction more responsively without waiting for formalized training plans at unit level. VTP with VR

and AR will effectively supplant instruction, offering additional advantages of standardization and scheduling ease.

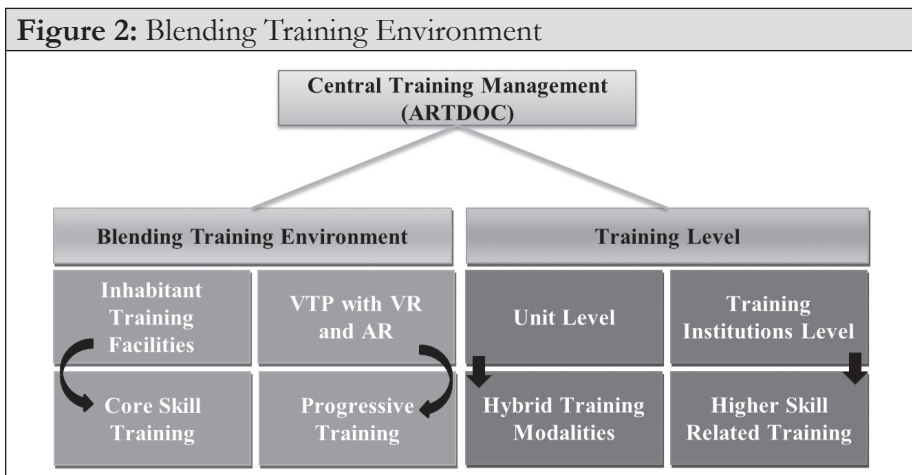
Facilitating Training Management. VTP with VR and AR has thrown up a plethora of opportunities to leverage training modalities. It will reduce time for training due to escalating administrative and OOTW commitments. It will supplement existing methods of training.



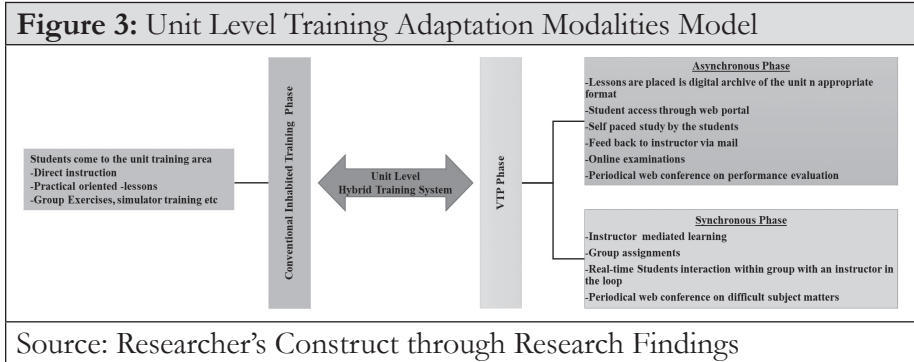
Adaptation Scope

Blending Training Environment. The scope of VTP would be to fit in within the overall framework of present training environment. It would be a blended training environment, because firstly, BD Army yet to have any complete VTP with VR and AR training system and secondly, for the related physical peer-to-peer teaching interaction which is crucial at military training. However, the concept of training 'anytime and anywhere' implies greater flexibility for both macro and micro-level training management. Here, macro-level to be coordinated centrally at formation or unit level. Core training in field facilities and soft-skill/cognitive domain growth training can be given in the blended VTP with VR and AR environment (VTP + Habitant Training Platform). In both cases, central training management at the macro-level plays a crucial coordinating role to prevent duplication of effort. On the other hand, at micro-level, VTP

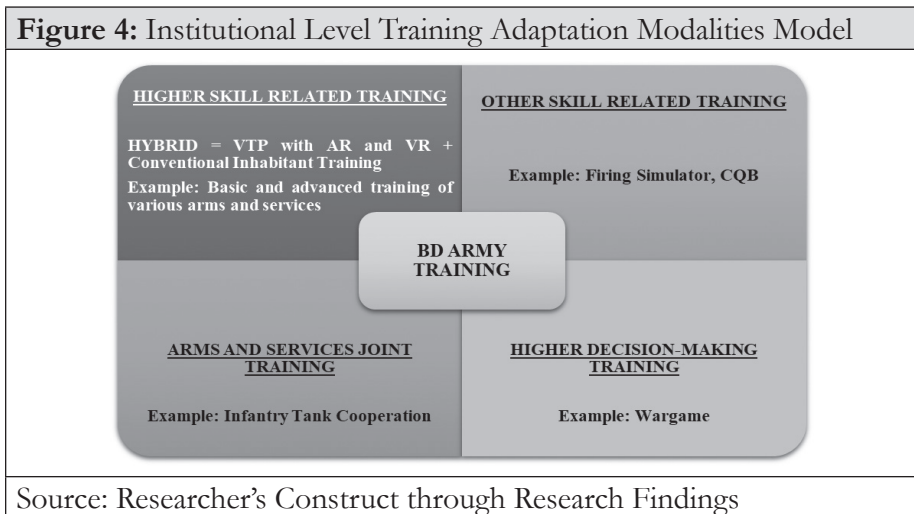
can provide the learners with individualized, self-modifying on-the-job progressive training. Here, ARTDOC will be the central and coordinating authority. Also, central training management can provide individuals with higher training through VTP in collaboration with training institutions for collective training. Figure-2 illustrates the concept of training management in a blended environment:



Unit Level Training Adaptation Modalities. Unit level basic skills development training, such as operating equipment, basic tactical knowledge, linking theoretical and practical knowledge would be appropriate for the initial stage. A hybrid training method can be followed which combines VTP with AR and VR and direct instruction module. Unit training to be incorporated through both synchronous and asynchronous phases. Asynchronous learning will be via online without real-time interaction. Lessons should be put in the digital database of the unit in the asynchronous phase. Here, trainees will access lessons through web-portal at self-paced modalities. In synchronous phase, limited real-time collaboration would be generated. Finally, students will attend group classes and exercises in the traditional inhabited training phase. The basic structure of a proposed hybrid training is shown in Figure-3. A fully e-learning based VTP with an AR and VR solution will be suitable for further training.



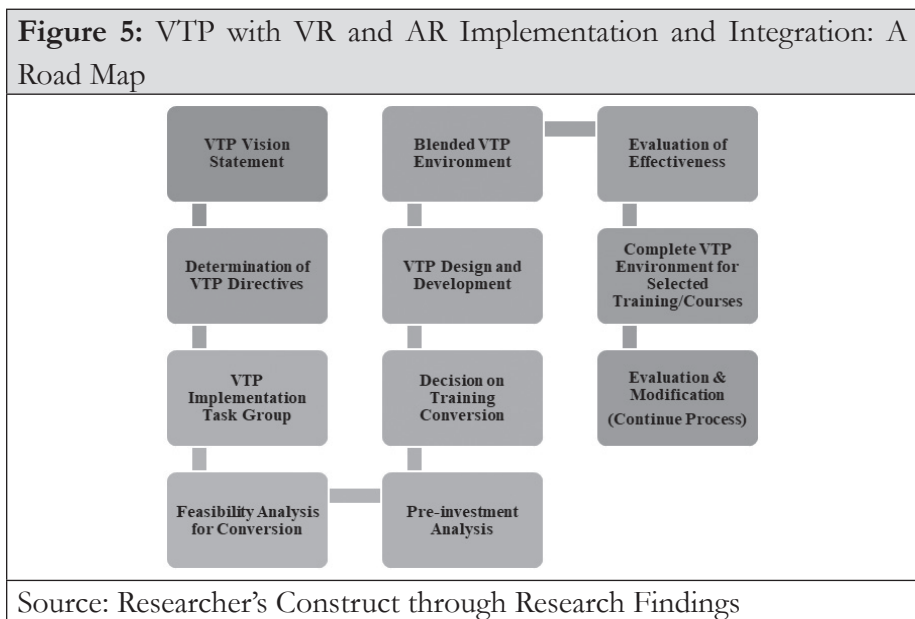
Institutional Level Training Adaptation Modalities. Institutional training modalities will include higher skill-related and arms/services specific training. Related training to be conformed to the course/cadre of institutional training. It will be aimed to reduce the training duration at institutional level to maximize the presence of soldiers at the unit. Here, an institutional training arrangement to be set up concerning the training syllabus; like which part of the training to be completed through VTP before attending the training at the institution. Technical architecture of VTP to be made accordingly in collaboration between unit and training institutions.



The Proposed VTP with VR and AR Model-Pilot Project Outlining Implementation Process

Technical Setup. Primary technical setup will mainly include required infrastructure development, establishment of a server-based data network with big storage capacity and preparation of online training module. It will also require arrangement of user access platform (Laptop/Tab/Mobile).

Making Headway - VTP with VR and AR Implementation and Integration: A Roadmap. Implementing VTP with VR and AR would be a demanding task for BD Army. It will require a visionary approach and strong commitments to implement VTP in the context of the BD Army. ARTDOC must play a pivotal role in coordinating with other training stakeholders. Figure-5 gives a preliminary road map with a few milestone goals in this regard. To implement the initiatives, it is necessary to set up a separate task group under the overall supervision of ARTDOC. The decision on the eligibility of the training integration and adaptation by the task group should be followed by a further implementation process.



Short-term Implementation and Integration Plan: Pilot Project (2 Years). ARTDOC will take the lead role as a top-down approach. It will ease the initial start-up in terms of decision making, organizing the task group, coordination with all stakeholders, finance, resource management, and overall execution of project. In short-term implementation process, unit centric training modules (Arms/Services Specific) are to be focused while implementing VTP with VR and AR. The core steps would be:

- Secured Network Architecture.
- Preparation of VTP Module in the Form of e-Library.
- Facilitating User Access Platform.
- Developing Skilled Manpower and Own VTP Product.

Mid-term Implementation and Integration Plan (3 to 4 Years). In mid-term implementation plan, group or entity-centric (Detachment/ Section/ Platoon/ Company Level) training pedagogy are to be focused. Following the short-term plan, more training modules are to be prepared. Own R&D is to be functional to develop own product.

Long-term Implementation and Integration Plan (5 to 6 Years). In long-term implementation plan, higher decision-making related training modules are to be focused through VTP with VR and AR. Mainly, this phase of implementation will focus on expansion and integration within the level of formations and training institutions. Specialized VTP Workshop to be established with the progress of R&D. There will be a central specialized VTP workshop and other detachments of VTP workshops to be placed at formation level to facilitate the technical support. Centrally, all the workshops are to be controlled and administered by ARTDOC.

Discussions

VTP with VR and AR - General Conception

VTP is a collaborative training system maximizing human performance in a multi-echelon mixed-reality world through computing technology

(software and hardware). VR refers to environments created by immersive, interactive, multi-sensory, viewer-centric, three-dimensional device and the mixture of technologies needed for creating those environments. AR is a technology with three key requirements: combining real and virtual objects, aligning real and virtual objects with each other, and interacting in real-time.

Global Trend of VTP with VR and AR Technology

Military simulation and VTPs are progressively getting adopted by armed forces of many countries across the globe. It has significance for the armed forces to invent massive innovation in simulation-based training technologies which also include technologies such as big data, AI, and cloud computing.

A focus on developing synthetic training environments and interoperable virtual training platform capabilities for virtual training are some of the key trends in this market (World Web Index, 2019). The trends of VTP with AR and VR potentials on different field is given below.

In 2017, the global augmented and virtual reality market size stood at \$11.35 billion. This industry forecast is expected to hit \$571.42 billion by 2025, rising at a Compound Annual Growth Rate (CAGR) of 63.3% between 2018 and 2025 (PRNewswir, 2020). Military simulation and VTP provides the ability to meet varied requirements, which is resulting in the overall market growth.

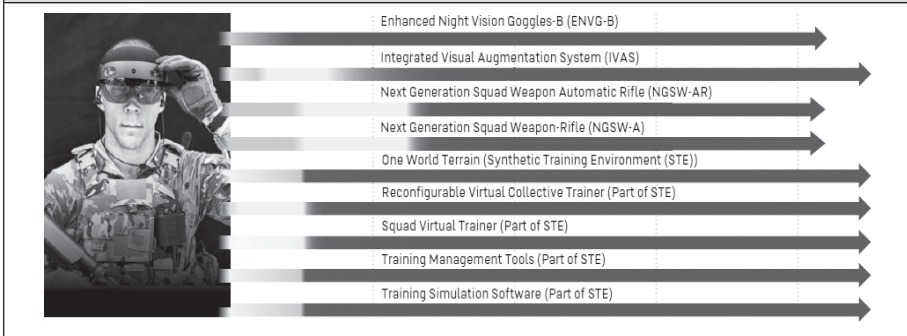
Use of VTP with VR and AR by Other Armed Forces

The research has also identified the uses of VTP by different Armed Forces. Details are appended in table 2:

Table 2: Use of VTP with VR and AR by Other Armed Forces

Country	Uses
USA	<ul style="list-style-type: none"> • Equipment Training • Virtual Boot Camp • Medic Training (Battlefield) • Vehicle and Fleet Simulate • Distributed Interactive Simulation (Battlefield Simulate) • VTP Based Leadership Training
UK	<ul style="list-style-type: none"> • VR Recruitment Training • Physically Simulated Military Equipment (PSME) • Virtual Military Equipment (VME) • VR in Land Training (VRLT) • Therapeutic Virtual Environment
China	Intelligent Commando VR Training System
India	Native virtual reality simulators to strengthen the capabilities of its commandos involved in counter-terror operations in Jammu and Kashmir
Turkey	<ul style="list-style-type: none"> • Bohemia Interactive Simulations (VBS3) • Air defence missile systems such as the RBS-70

Figure 6: Future Training Arenas of USA with VTP



Source: Accomplishment and Investment Plan (<https://www.army.mil>)

Inhabitant Training Aid System Vis-a-Vis VTP with VR and AR Training Aid System of BD Army

Analysing through the research, inhabitant training aid system vis-a-vis VTP with VR and AR training aid system of BD Army is comprehended as follows:

PL

- PL stands for Programmed Learning.
- It involves providing training, taking test on what is taught, and providing feedback on the spot.

LTT

- LTT stands for Literacy Training Techniques and includes Audio-visual Training and Simulated Training.
- In Audio-Visual training aid to the job skills and situations are used to train.
- In Simulation, training about certain procedures/technique and costly equipments is given in an artificial environment that is similar to the real scenario.

EPSS

- EPSS stands for Electronic Performance Support System and includes customized training aid and diversity training.
- Training aid uses of different virtual reality techniques and instructions for assisting at learning while diversity training is used when trainees are diverse to specific scnerio.

OTF

- OTF Stands for Own Training Facility.
- It facilitates training through practice at any time and anywhere.

AT

- AT stands for Apprenticeship Training.
- It involves providing training through both classroom lectures and OTF.

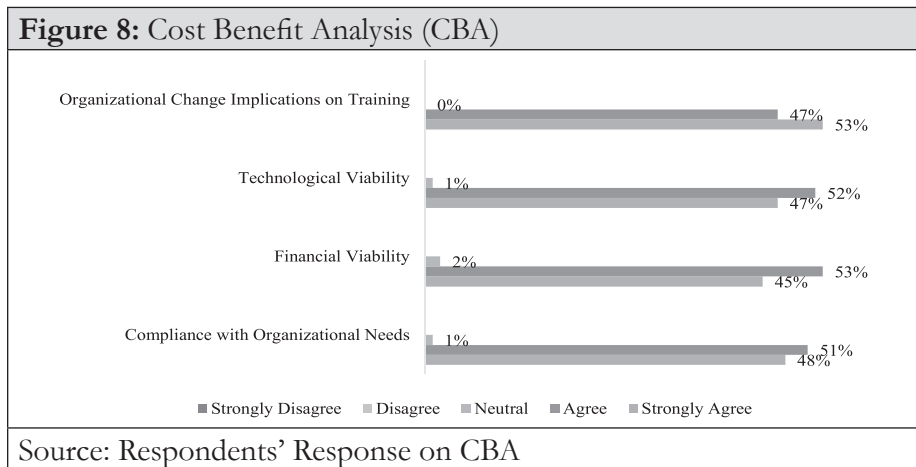
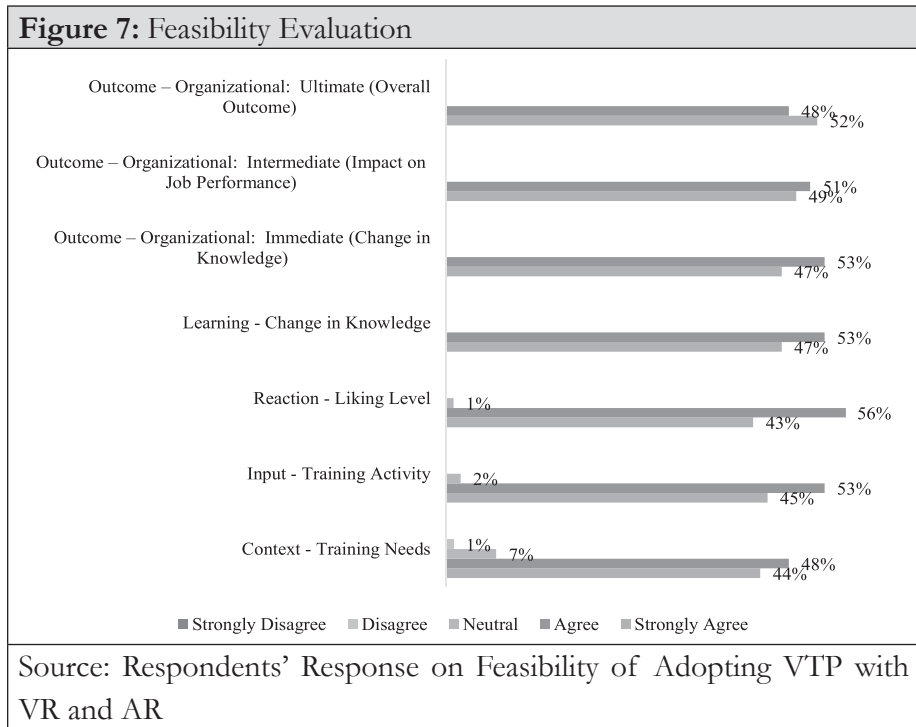
JIT

- JIT stands for Job Instructions Training.
- It involves a systematic training process in which training is given on each job task in a sequence through VTP.

Feasibility Evaluation

Overall feasibility evaluation proved that VTP will be able to fulfil the context of training needs, activities as a different learning environment. CBA also indicates that it needs to comply with organizational needs, financially viable, technologically suitable and impact on organizational change implications on training. To keep pace with the digitalized era, BD

Army also needs transformation in its professional training system. Now, it is a necessity of time to adopt VTP with VR and AR. To do so, it is very much essential to find out the feasibility where VTP with VR and AR can be adopted.



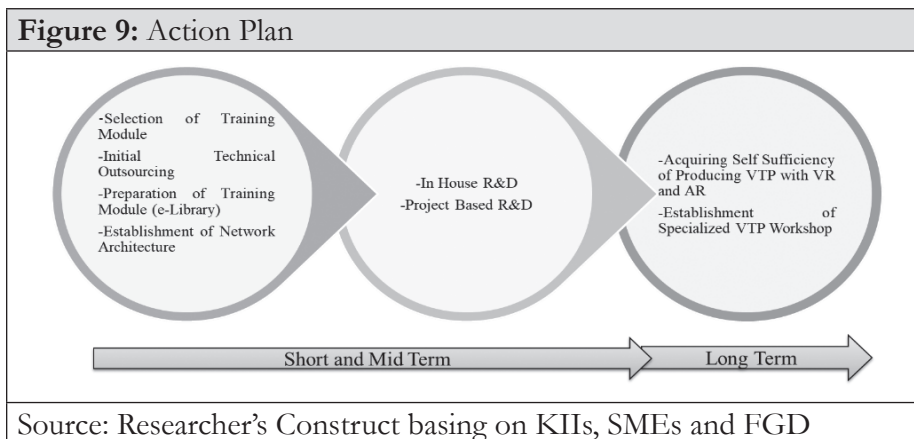
Challenges of Adopting VTP with VR and AR

Research findings presume that adoption of VTP with VR and AR in existing army training will have various challenges in implementation process. Challenges are stated below:

- IT structure and technological competency of BD Army.
- IT culture in BD Army.
- Technical outsourcing.
- Economy of effort.
- Consensus and mind-set of making change (Among Different Stakeholders).
- Security issue being online.

Addressing the Limitations and Challenges of the Proposed Model

Rendering Vision and Direction. Eventually, it demands a top-down approach. ARTDOC should translate that vision into directives. In doing so, ARTDOC may formulate a year wise action plan in the form of ‘VTP Directive’ explaining the actions and implementation plan. The general action plan is given in Figure-9.



Integration of R&D Efforts. ARTDOC should carry out R&D focusing the training institutions as a priority. Besides, a coordinated effort to be taken with defence organisations like BUP, MIST and BMTF. ARTDOC may also coordinate with concerned civil IT firms/ organisations for such project.

Developing Skilled Manpower. To address the limitations of skilled manpower, expert personnel on required field should be initially integrated for capacity building. It is to be an integrated effort to develop the skilled manpower in coordination with training institutions, formations and units.

Security Issue. Strict IT audit and motivation at all levels can minimize security challenges. Besides, a robust IT structure with security to be given paramount importance while incorporating the VTP with AR and VR.

Outsourcing. Start-up capability building to be outsourced driven due to lack of own expertise. Initial activities should be closely integrated with civil and own capacities. However, own intellectual and security issues should not be compromised.

Hypothesis Analysis

The research hypothesis ‘VTP with VR and AR will enhance the Bangladesh Army’s peacetime training performance.’ has been analysed using SPSS software. There are 02 variables i.e. VTP with VR and AR (independent variable) and peacetime training of BD Army (dependent variable). In line with the variables, 02 constructs have been formulated as follows.

Construct 1: VTP with VR and AR

Descriptive statistics basing on the feasibility’s parameter to ascertain the need of VTP with VR and AR is shown in Table-3.

Table 3: Descriptive Statistic on the Need of VTP with VR and AR (Survey Results)

	N	Mean	Std. Deviation
Context - Training Needs	217	4.18	1.161
Input - Training Activity	217	4.19	0.911
Reaction - Liking Level	217	3.36	0.938
Learning - Change in Knowledge	217	3.72	0.777
Outcome – Organizational: Immediate (Change in Knowledge)	217	3.67	0.841
Outcome – Organizational: Intermediate (Impact on Job Performance)	217	3.78	0.854
Outcome – Organizational: Ultimate (Overall Outcome)	217	4.01	0.998

Construct 2: Peacetime Training of BD Army

Descriptive statistics basing on the CBA at the impact of peacetime training of BD Army is shown in Table-4.

Table 4: Descriptive Statistic on the Impact of Peacetime Training of BD Army (Survey Results)

	N	Mean	Std. Deviation
Compliance with Organizational Needs	217	4.24	0.911
Financial Viability	217	3.36	1.016
Technological Viability	217	3.66	0.968
Organizational Change Implications on Training	217	4.19	0.938

Statistical Analysis

Relationship between constructs have been analysed with various tools using SPSS. Analysis and results of various tests are appended below:

Linear Regression Analysis. To measure relationship between need of VTP with VR and AR and enhancement of peacetime training of BD Army, linear regression analysis has been done through SPSS. According to model summary ($R=0.809$), there is a strong relationship between need of VTP with VR and AR and enhancement of peacetime training of BD Army. R Square, the coefficient of determination, is the squared value of

the multiple correlation coefficient. It shows that 75.9% of the variation in time is explained by the model.

ANOVA: The ANOVA table is used to check whether there is a statistically significant relationship between variables. The Sig. 0.000 value is < 0.05 (Table 5). This implies (Sig.) that there is a statistically significant relationship between need of VTP with VR and AR and enhancement of peacetime training of BD Army.

Table 5: ANOVA Table

ANOVA ^a					
Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	17.845	1	17.845	47.577	0.000 ^b
Residual	34.356	97	.375		
Total	52.201	98			

a. Dependent Variable: enhancement of peacetime training of BD Army
b. Predictors: (Constant), Need of VTP with VR and AR

Coefficients. The coefficients table provides information to predict dependent variable from independent variable. The Table 6 shows that, 01 (one) unit increase in need of VTP with VR and AR will result to 0.779 increase in enhancement for peace time training of BD Army. Standardized beta coefficient compares the strength of the effect of independent variable to the dependent variable. In this case, there is a strong effect of VTP with VR and AR to enhance the peacetime training of BD Army as Beta value is 0.589.

Table 6: Coefficients

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	1.109	0.435		2.560	0.013
Need of VTP with VR and AR	0.779	0.113	0.589	6.827	0.000

a. Dependent Variable: enhancement of peacetime training of BD Army

Correlation between Variables. The Table 7 below shows Pearson Correlation value 0.589, which means that there is a strong uphill positive linear relationship between need of VTP with VR and AR and enhancement of BD Army’s peacetime training. The significance value 0.000 indicates a significant correlation between variables:

Table 7: Correlation between Independent and Dependent Variables

		Need of VTP with VR and AR	Enhancement of Peacetime Training
Need of VTP with VR and AR	Pearson Correlation	1	0.589**
	Sig. (2-Tailed)		0.000
	N	217	216
Enhancement of Peacetime Training	Pearson Correlation	0.589**	1
	Sig. (2-Tailed)	0.000	
	N	216	217

** Correlation is significant at the 0.01 level (2-tailed)

One Sample T Test (Hypothesis Testing). One sample T test for both the constructs at 95% confidence level has been done. Mean values of the constructs are 3.84 and 3.86 for need of VTP with VR and AR and enhancement of peacetime training, respectively. In a five-point Likert scale, the mean value between 3.41 and 4.20 indicated population ‘agreed’ with the statements that, ‘VTP with VR and AR will enhance the BD Army’s peacetime training performance’.

In Table 8, Sig. (2 tailed) or p value for both the construct is 0.00. Ideally, p value lower than 0.05 indicates less support for the null hypothesis (VTP with VR and AR will not enhance the BD Army’s peacetime training performance), hereby null is rejected. As 0.00 is < 0.05, so the alternate hypothesis is proved.

Table 8: One Sample Test

Model	Test Value = 0		Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
	t	df			Lower	Upper
Need of VTP with VR and AR	79.739	100	0.000	3.805	3.699	3.921
Enhancement of peacetime training of BD Army	56.625	99	0.000	4.043	3.886	4.178

In the light of the above scientific analysis, it is proved that ‘VTP with VR and AR will enhance the BD Army’s peacetime training performance’, thus alternate hypothesis is proved. On the contrary, null hypothesis, ‘VTP with VR and AR will not enhance the BD Army’s peacetime training performance’ is rejected.

Recommendations

Basing on the findings of the research, following are recommended:

- BD Army may incorporate VTP with VR and AR in the existing framework of the training system. To do so:
- ARTDOC may formulate the vision with necessary directives for adapting and implementing the VTP with VR-and-AR for BD Army.
- A Task Force under ARTDOC to be formed to carry out a feasibility study for VTP adaptation, integration and implementation. Further, it should also decide on suitability of blending training environment (VTP + Habitant Training-Platform).
- Training institutions, formations and units are to be integrated with the Task Force for implementing and evaluating the VTP actions plan.
- ARTDOC may carry out R&D for developing VTP with VR and AR coordinating with organisations like BUP, MIST and BMTF. ARTDOC may also coordinate with concerned civil IT firms and organisations for such project.

Conclusion

The researcher endeavoured to work on the feasibility study of Virtual Training Platform (VTP) with Virtual Reality (VR) and Augmented Reality (AR) for BD Army's peacetime training for two reasons: firstly, the potentials of VTP pedagogy in preparing more effective peacetime training is not ascertained in the context of BD Army and secondly, examining the possibility of blending the inhabitant existing training and VTP with VR and AR to make the training more effective and efficient. The significance of this research lies in its attempt to adopting VTP with training curriculum of BD Army for contributing to the overall training development. It is also quite distinct from the empirical data that armies across the globe are already reaping substantial benefits out of their investment in VTP with

VR and AR. Yet, is it equally feasible in BD Army's training curriculum? Researcher linked survey findings to determine the feasibility in the BD Army context. Presently, all the training institutions of BD Army have simulator-based training systems. However, the study through KIIs, SMEs and FGD clearly indicated that there are absence of self-paced/driven training aid, lack of interactive learning and limitation to access lessons' content at learner's freedom of training. Thus, technological edge over the training aids is very important to meet the present day's requirement. VTP can aid in dealing with the capacity constraints and absence of progressive training.

Having identified the requirements, researcher focused on the feasibility evaluation of VTP for enhancing the peacetime training outcome. The feasibility study indicated that it would meet the training needs. CBA is important while incorporating a new system. It is to be coherent with organizational needs, financially viable, technological practicable and organizational change implications on training. Adoption of VTP with VR and AR in existing army training will have various challenges in implementation process. IT structure and technologically competency of BD Army will be a challenge while implementing VTP with AR and VR. IT culture will be a concern for reaching up to root level training. Economy of effort is to be taken into cognizance for initial investment of training design and development. There is a probability of resistance of consensus and mind-set in this training pedagogy due to a paradigm change. IT security will be a challenge being online training module.

Conceiving the hypothesis, this study suggests adaptation, integration and implementation of VTP considering present and future projected capabilities of BD Army. Adaptation would be dynamic for BD Army. VTP implies increased opportunities in both macro and micro level training management. Core training in field facilities and soft-skill/cognitive domain growth training can be delivered in a blending VTP with VR and AR environment (VTP + Inhabitant Training Platform). In both cases, central macro-level training management plays a crucial coordinating role

to prevent duplication of effort. On the other hand, at micro-level, VTP will provide the learners with individualized, self-modifying progressive on-the-job training. Central training management may also provide individual higher training through VTP in collaboration with training institutions through ARTDOC for collective training. Training at the unit level for basic skill development such as equipment operations, tactical and technical basic level training will be relevant. At unit level, a hybrid training modality that combines VTP with AR and VR and a direct instruction module can be followed. Provision for both synchronous (Self-paced Learning Modality) and asynchronous (Real-time Mediated Collaborative Learning) VTP should be rendered here. Institute training via VTP will mainly strive for higher-skilled training.

From the holistic research findings, the researcher suggested a VTP implementation and integration road map. This road map to be implemented with a few milestone goals, like; ‘Determination of VTP Directives’, ‘Pre-investment Analysis’, ‘Decision on Training Adaptation and Integration’ and ‘Blending VTP Environment’. ARTDOC must play a pivotal role in the overall framework of roadmap. The implementation process should be carried forward under the overall supervision of ARTDOC, and, in coordination with the training centres, formations, units and other stakeholders. Total plan is to be spanned within the time framework of short, mid and long term.

This study essentially addressed the limitations and challenges of the proposed model. Rendering vision and directives is to be the first step to address the limitations and challenges. Here, ARTDOC should formulate ‘VTP Vision’ the after translating that vision into directives. In doing so, ARTDOC is to formulate a year-wise action plan in the form of ‘VTP Directive’ explaining the adaptation, implementation and integration. ARTDOC should carry out R&D coordinating mainly with the training institutions. Besides, BUP, MIST, BMTF and civil IT farms to be integrated for initial outsourcing. IT culture and security as challenges to be mitigated through a meticulous training plan and IT structure development.

Probability of resistance in training pedagogy due to a paradigm change, every military training institution needs to analyse details to reach a consensus on a paradigm shift from traditional learning to a digital learning environment. The implementation of VTP in the context of BD Army will require a visionary approach and sheer dedication.

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LESS CAPABLE LARGER UNITS VIS-À-VIS MORE CAPABLE SMALLER UNITS FOR BANGLADESH ARMY

**Lieutenant Colonel Mohammad Farid Uddin, SUP, afwc,
psc, Engrs**

“Right, as the world goes, is only in question between equals in power,
while the strong do what they can and the weak suffer what they must”

-Thucydides

Introduction

The geo-political location of Bangladesh is very critical; located at the crossroad of Hindu and Buddhist civilization. Majority of the population of India (79.8% Hindu) and Myanmar (87.9% Buddhist) possess different religious and ideological beliefs than majority of the population of Bangladesh (90.5% Muslim). Strategic think tank Samuel Huntington rightly predicted in his book “Clash of Civilization”, ‘People’s cultural and religious identities will be the primary source of conflict in the post-cold war world’. Considering this argument to be relevant, the probability of conflict in the region seems to be very high in future due to presence of strong Hindu-Muslim-Buddhist fault line. Depriving the citizenship right of Rohingya Muslims through Myanmar Citizenship Law 1982 and carrying out brutal ethnic cleansing on the minority Muslims in 2017 validate the clash of civilization. The similar situation is prevailing in India. Rapid rise of Hindu nationalism in India is creating a potential instability in the region; threatening to expel 1.9 million Muslim population from Assam only in the name of illegal migrants. Under such geo-political realities, Bangladesh needs a credible defence force to protect the vital interest of the nation.

Bangladesh Army is expanding its size and enhancing its capability as per Forces' Goal 2030. While doing the force structuring, a mixed method of capability based and threat based approach was followed. Mere increasing in number will not serve the purpose if the Army cannot effectively deter the threat. Capability is more important than the size of the force. A herd of hundreds of buffalos cannot prevent a small group of lions from hunting down their prey. Bangladesh Army needs units like team of ferocious lions. The question is, do the units possess such prowess at the moment?

Now it is the age of technology; warfare has become highly complex. Artificial intelligence, cyber, space, and hybrid warfare have changed the concept of fighting. Tactics and doctrine of WW II are likely to be less effective in most of the situations in modern battle space. If Bangladesh Army does not adapt to changes, it will lose its relevance. Former PSO AFD also supported the concept of smaller units, "Highly capable all-arms integrated smaller units would be the battle winning factor in future days." (Rahman, 2020). In a survey, 93% respondents agreed with the proposal that there is a need for capability based restructuring of the units.

Research Methodology

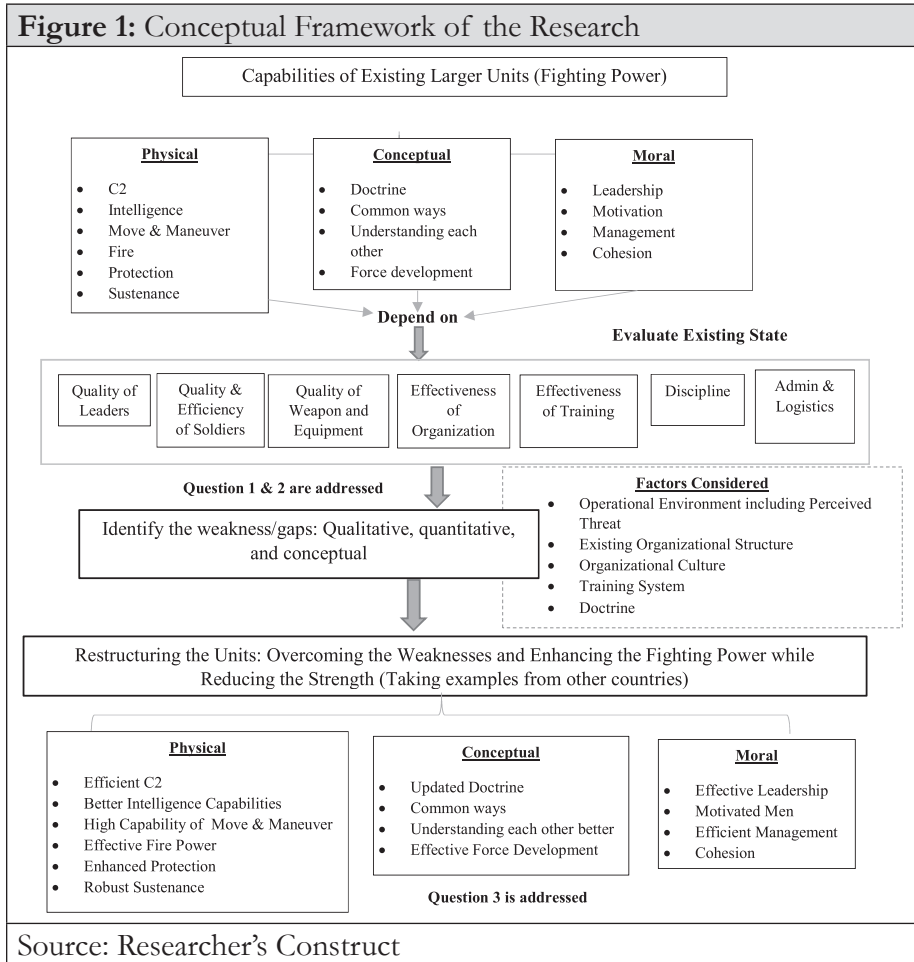
Research Type This is a descriptive research with cross-sectional type design. For the purpose of research a mixed-method approach (combination of quantitative and qualitative research) has been followed based on numerous sources of information.

Population and Sample Size Due to special COVID-19 pandemic situation, only 403 officers could be reached by the researcher.

Limitations of Research

In this research, only Infantry Battalion and Division Engineer Battalion are taken as model for restructuring. Restructuring of other units may be done through separate studies.

Conceptual Framework



Operational Definitions

Infantry Units. In this paper all basic foot infantry units will be termed as 'Infantry Units'. Other types of infantry units will be named in full; Division Support Battalion, Para Infantry Battalion, Mechanized Infantry Battalion.

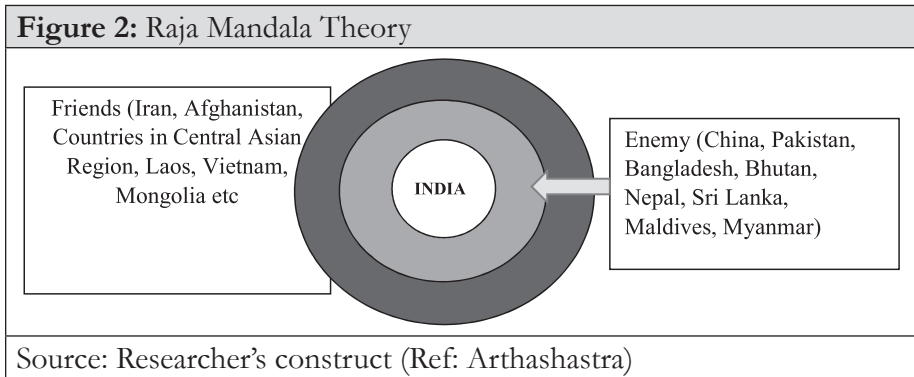
Combat Power. Combat power is the total means of destructive and/or disruptive force, which a military unit/formation can apply against the opponent at a given time (US DoD, 2019).

Fighting Power. Fighting power comprises of physical, moral, and intellectual components.

Evaluation of the Operational Environment (OE)

Regional Security Environment

Indian Hegemony. India believes in the theory and policy of Kautilya (370-283 BCE). Kautilya in his ‘Raja Mandala’ theory or ‘Circle of States’ says, ‘neighbouring states are enemies and neighbour’s neighbours are friends’ (Arthashastra). According to this theory, Bangladesh being a neighbour should be considered as ‘Enemy State’.

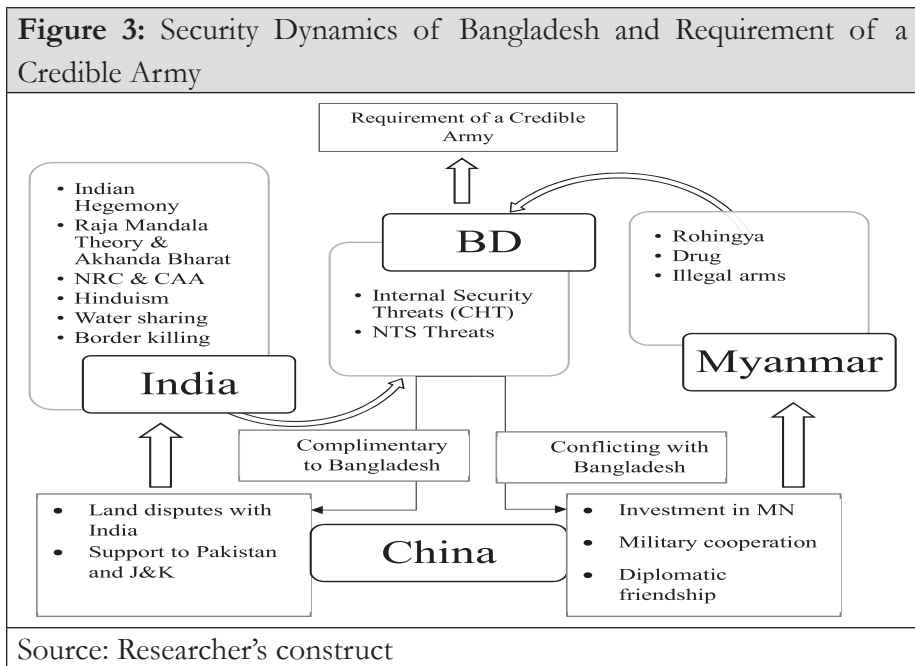


Kautilya also mentioned in his ‘Arthashastra’ about the dealings with those states of Raja Mandala. He says, there are four ways to settle disputes with other countries; Sama (conciliation), Dana (gift), Bheda (divide), Danda (Punish/War) (Rangarajan, 1992). Good and friendly countries to be treated with Sama, making treaties and agreements. Neutrals and potential friendly countries to be given Dana (donations, loans, and gifts) to bring her under own circle of influence. Potential hostile countries to be divided (Bheda) and kept engaged by all available means so that she cannot develop or become strong. The last type of countries which are

openly hostile should be punished by waging war by all means. India's policy with her neighbours clearly reflects the application of Kautilya's theory. Neighbours being potential enemies must be kept under control or domination. Many political leaders of India also believe in 'Akhand Bharat' theory and dream for unified India which is a serious threat to the small neighbours like Bangladesh.

Indo-Bangladesh Contentious Issues. India's perception about Bangladesh is mostly negative. Though India doesn't want to open a new front against Bangladesh by declaring it as a hostile neighbour but she likes to contain Bangladesh by all means. Muslim majority in Bangladesh is a big concern for India as most of the Indians believe in Hinduism. Very strong anti-Muslim sentiment prevails in every sector of India. India's view about Bangladesh is very clearly expressed in Indian Defence Review, "The threat posed by Bangladesh is more vicious and insidious. The demographic assault from Bangladesh on India is unrelenting and is impacting not only the border regions but also the inland areas, including the national capital New Delhi. According to an estimate, the annual illegal immigration from Bangladesh is approximately 300,000 and the total number of Bangladeshi nationals in India is approximately 15 to 17 million. Indian insurgent groups continue to enjoy safe heavens in Bangladesh, particularly in the Chattogram Hill Tracts (CHTs). There is a growing anti-Indian constituency in Bangladesh, which is being aided and abetted by the Inter-Services Intelligence (ISI) of Pakistan. Mosques and Madrassas on both sides of India-Bangladesh border have sprung up in preposterous density, even in areas with thin Muslim population. If experience in J&K is to go by, some of these serve as Jihadi factories and bases for intelligence operations by inimical powers, particularly by ISI". (Singh, 2014). Occasional tension along the Indo-Bangladesh border has been a regular phenomenon. Over the last 25 years about 415 Bangladeshi civilians and 10 BDR/BGB personnel have been killed by BSF. So-called push in of Bengalis by the Indian authority, killings along the borders by BSF are threats to the security of Bangladesh.

Bangladesh –Myanmar Contentious Issues. Myanmar had been a silent neighbour of Bangladesh. She has started creating irritation by exporting her internal ethnic problem into Bangladesh. The conflicting interests with Myanmar are the deportation of Rohingyas (FDMN), demarcation of maritime boundary, illegal drug trafficking and alleged cross border movements of insurgents. The relation deteriorated severely in 1991 when Tatmadaw launched a surprised attack and ransacked the then BDR border outpost at Rejupara in Cox’s Bazar district. Myanmar Forces killed three members of BDR and looted their arms and ammunition. However, a major regional conflict was averted because of exercising restraints by Bangladesh. Recently Myanmar has started publishing maps of the country showing Saint Martin’s Island as her own territory. This gives a clear indication of Myanmar’s aggression against Bangladesh. The relation with Myanmar has further aggravated due to deportation of 1.1 million of Rohingya population to Bangladesh in 2017. As observed, so far the military ruled Myanmar is very reluctant for the repatriation of FDMN from Bangladesh. The security dynamics of Bangladesh is explained in Figure 3.



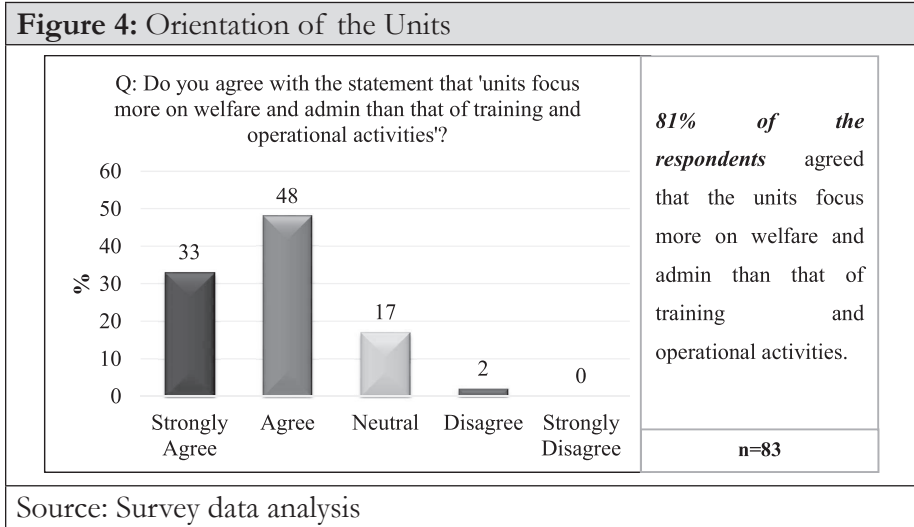
Present State of Fighting Power of the Units of Bangladesh Army

General

Units are the core elements of an army who fight together. It is mostly applicable for the infantry units. Other units though train together in peace time but divided into sub-units with the brigade groups and operate closely with infantry or armoured units or support their operations. Practically it is very difficult to measure the fighting power or combat capability of a unit. Everything cannot be measured as many intangible or conceptual elements are also part of this capability. However, it is possible to find out the standard of a unit through a set of tests. To evaluate the fighting power of the units, it is also important to understand the system in which they function i.e. organizational culture and structure. System has a huge influence on the character and quality of a unit.

Organizational Culture of the Units

An organization's culture defines the proper way to behave within the organization. In Bangladesh Army, few common organizational cultures prevail at unit level like feelings for the unit, authority of the CO, more focus on games and sports competitions and admin welfare of the troops, visit oriented training, stage management etc. Organizational culture is established through the process of tradition, human nature, leadership philosophy and vision. The organizational culture varies in different arms and services; units having regimentation system have more bonding among the soldiers than the units that do not have regimentation system. Organizational culture reflects the attitude of the unit as a whole. Due to not having battlefield exposure and experience, the organizational culture of the units of Bangladesh Army has become mostly welfare oriented.



Existing Organizational Structure

Infantry Battalion

Mission. To close with and destroy the enemy.

Organization. Infantry battalion consists of 741 personnel with four rifle companies and a HQ Company. Unit is commanded by a Lieutenant Colonel having staffs and personnel under battalion HQ. Rifle companies are the main fighting components whereas the HQ Company acts as a supporting company. It consists of Battalion Mortar Platoon, Assault Pioneer Platoon, Signal Platoon, and Admin Platoon. The companies are led by officers and the rifle platoons are led by JCOs.

Weaknesses in Existing Organization. The mission and capability holds good for all types of operations undertaken by an infantry battalion. It also offers adaptive quality of the units under complex battle situation. However the organization has following weaknesses:

- No AD elements.
- No ISR elements.

- No IED/explosive experts in Rifle Company. Bangladesh Army will have to fight mostly in BUA in future where IEDs will be the main threats. Infantry companies and platoons operating almost independently will not get support of the engineers very often. Therefore, in each Rifle Company there should be a team of IED experts from infantry.
- Inadequate manpower in Assault Pioneer Platoon to undertake immediate combat engineering tasks for the battalion. Only 17 persons with two NCO from engineers are not enough to provide close in protection to an infantry battalion.
- If the concept of small team fighting is the call of the day, four Rifle Companies for trench battle (WW I concept) may be reviewed.

Division Engineer Battalion

Mission

- To provide combat engineer support to an infantry division.
- To carry out combat mission of an infantry battalion when required, in an emergency.

Organization. Division Engineer Battalion consists of 1023 personnel with three field companies, one bridge company, one plant company, and a HQ company. Unit is commanded by a Lieutenant Colonel having staffs and personnel under Battalion HQ. Field companies are the main components to perform combat engineering tasks. Plant and bridge companies hold special vehicles and equipment to perform specialized tasks. The companies are led by officers and the field platoons are led by JCOs.

Weaknesses in Existing Organization

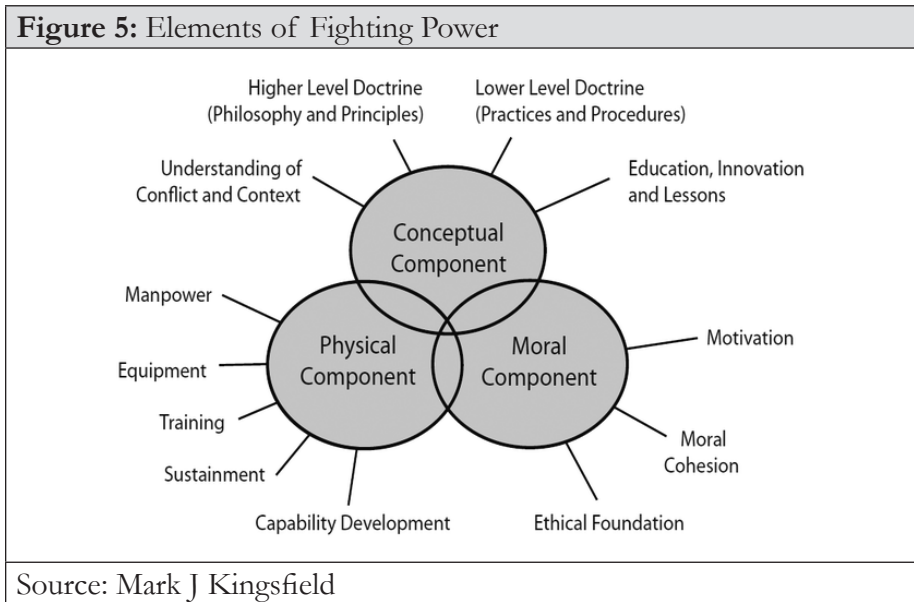
- Very less mechanical equipment and modern gazettes with field companies, therefore the strength is more (209). Manpower in Field

Companies can be reduced by incorporating mechanical equipment, AI, and robotics.

- No ISR elements.
- Expedient platoon of plant company does not have any meaningful employment. This platoon may be discarded.
- No fast bridging capability.

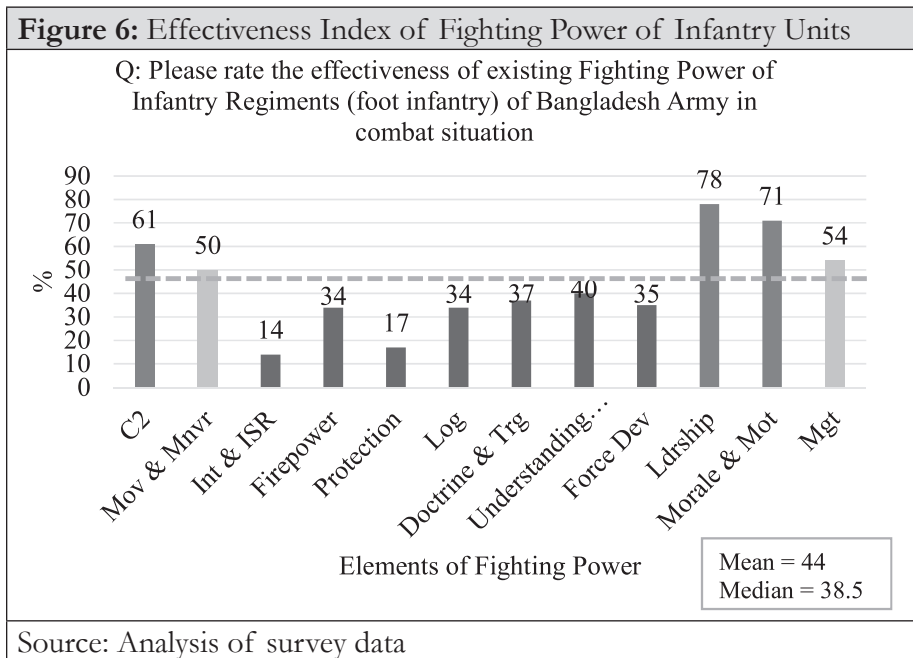
Fighting Power Analysis of the Units

Elements of Fighting Power. “Four factors constitute fighting capability of an Armed Forces: Manpower, training, platform and doctrine. Bangladesh is also lagging behind in terms of intellectual domain. Bangladesh is outgunned and outmanned in comparison to her adversaries. We must not be outsmarted. We need to build upon our intellectual capability.” (Rahman, 2020).



Infantry Battalion

Infantry battalions are the basic fighting units of Bangladesh Army. As per their mission and capabilities are concerned, they should be able to perform any combat tasks under any situation. Do the infantry units of Bangladesh Army possess that cutting edge capabilities? Can they fight and win against the potential adversaries with existing capabilities? It is not only the combat power that gives superiority over the enemy in the battlefield but also the fighting power. Leadership, morale, training, dedication, courage, professionalism contribute significantly in enhancing the fighting power of a unit. The survey results are shown at Figure 6.



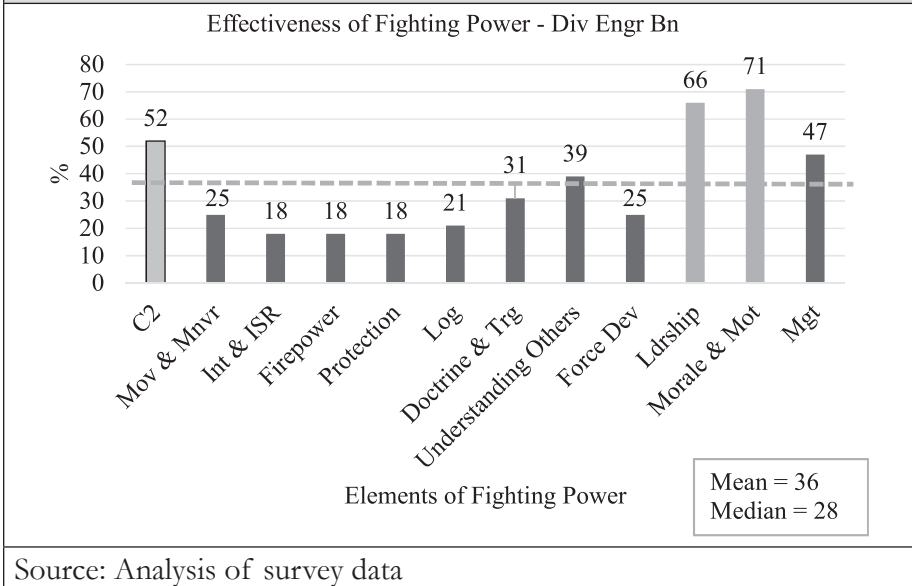
Analysis. Effectiveness index passing through mean 44 is a clear indication of weakness in fighting power. In an ideal infantry battalion, effectiveness of C2 should be more than 90%. Otherwise the units will not be able to ‘close with and destroy the enemy’. Soldiers will be deserters, officers will lose confidence. There will be low morale in the unit. Ultimately, fighting power of the unit will collapse. Major causes are likely to be availability

of less number of officers in the units, less capable JCO and NCO, platoons led by old and physically less fit JCOs. Young officers have better tactical knowledge but the JCOs have more experience. Existing infantry battalions seriously lack in move and manoeuvre capability. As they are known as 'foot infantry' the units possess very less number of vehicles. For future warfare, speed is also essential. Therefore, this capability of the units needs to be addressed. Infantry battalions almost do not have any ISR capability. This is a major weakness of this outfit. In terms of firepower, existing authorization of weapons seems good for an infantry battalion to produce enough firepower. However, few of the weapons need to be upgraded or replaced. Frequent change of anti-tank weapon is a major weakness of infantry battalions. Light and accurate anti-tank weapons are more suitable for close terrain like BUA and in restricted field of fire. BD-08 is an indigenous production; it should be improved by conducting more research and development. To make the soldiers expert on weapons, frequent change of weapon system should be stopped. Similarly, other elements of fighting power can be explained.

Division Engineer Battalions

Division Engineer Battalion is the largest unit in an infantry division. They are responsible to provide combat engineer support to entire division. They have two roles; primary role is to execute combat engineer tasks and secondary role is to fight as infantry. They have three field companies to be grouped with three infantry brigade groups. In addition, they have one plant company and one bridge company. The elements of fighting power are analyzed in subsequent paragraphs.

Figure 7: Effectiveness Index of Fighting Power of Division Engineer Battalion

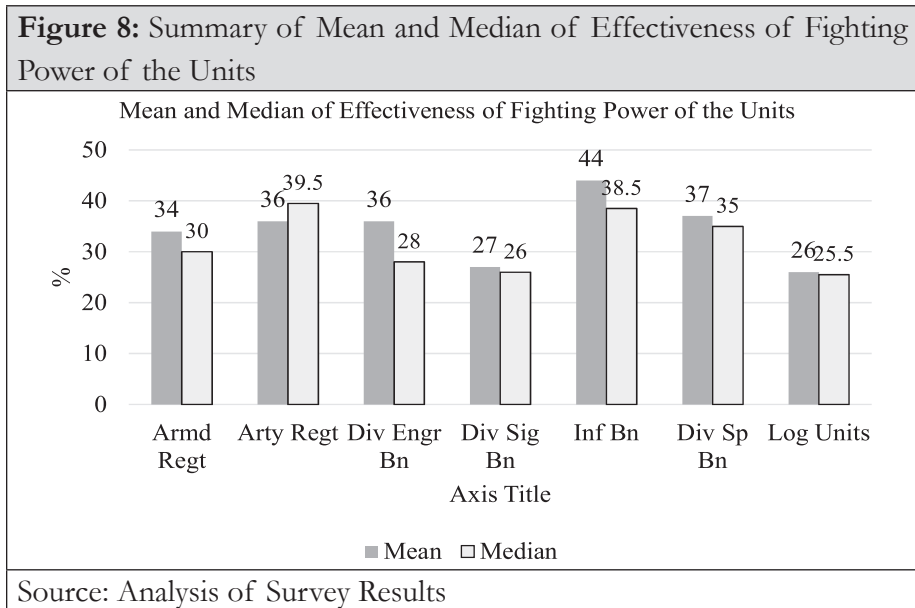


Analysis. Mean running along 36 shows a poor projection of fighting power of Division Engineer Battalion. Units perform their tasks in different locations in company, platoon or even section task groups. Centralized C2 is not always possible as well as not desired during any operation. Mission command and effective junior leadership is more important for the units. Most of the junior leaders are expert on their primary role i.e. combat engineering tasks. JCO/NCOs lead the Bomb Disposal teams throughout the year for entire army. They also execute different projects within the garrisons. However, they have serious limitations on leading the platoons/sections on infantry tasks. Units also lack modern communication equipment to exercise C2 effectively. If Mechanized Infantry Division is raised in future, Engineer Battalion of that Division needs to have compatible maneuver capability. Existing Division Engineer Battalions have adequate vehicles (16 x Jeep, 17 x Pick up, 20 x 3 Ton Lorry) for movement. However, to facilitate the move and maneuver of other arms and services in the battlefield, Engineer units should have different types of modern bridges, operational tracks,

mechanical minefield breaching equipment etc. Units almost do not have any intelligence and ISR capability. This is a major weakness of this outfits. Units will have to operate in diverse terrain, close to enemy and ahead of own infantry and armoured in adverse air situation. If they do not possess adequate ISR capability, they will remain blind about the battlefield. This capability needs to be enhanced in future. Training system and standard of the units are not at all encouraging. Engineers have serious lacking in training on live mines, minefield laying and minefield breaching. Both India and Myanmar have not signed the ‘Ban on anti-personnel mine treaty’ but Bangladesh has signed. Engineers need to continue the training on both anti-tank and anti-personnel mines. Explosive trainings are also limited to BD/CIED course at ECSME. Soldiers are interested to do this course for getting selected in overseas employment. However, training on explosives and IED should be a routine affair in Division Engineer Battalions.

Summary

The summary of survey results of all other units are shown in Figure 8:



Restructuring of Units: Infantry Battalion and Division Engineer Battalion

General

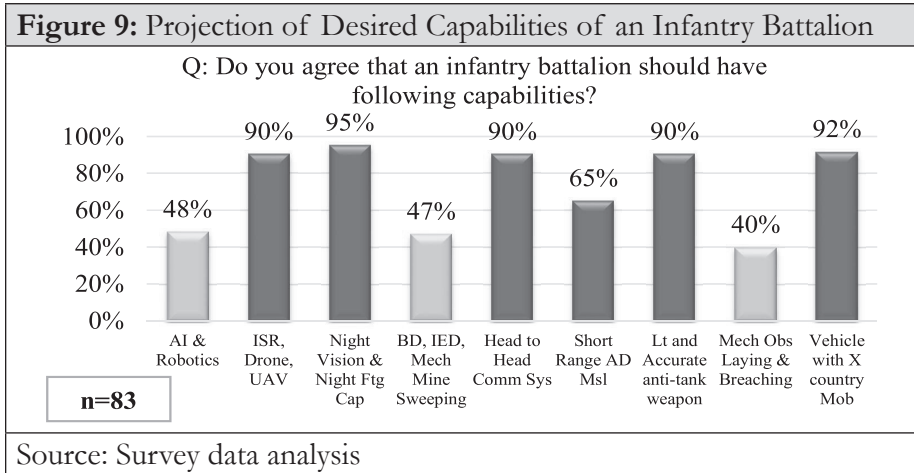
In this research, restructuring of only Infantry and Division Engineer Battalions are discussed. All other units may be restructured to attain the overall desired capabilities of Bangladesh Army. Efficiency and effectiveness are the key elements of modern forces. Number will not matter without the cutting edge capabilities. In this regard, subject matter expert also supported the concept of restructuring the units into smaller ones, “We have a quite large manpower in our armed forces comparing the threat we are facing. Do we need such large standing Armed Forces? Is there right balance between tooth and tail? Are the fighting formations complete? We need a well-trained smaller, well equipped, purpose oriented military formations.” (Rahman, 2020). In a survey, 98% respondents opined in favour of restructuring the units into smaller one with enhanced capabilities.

The concept of employment of the units in combat also needs to be reviewed. More capable smaller units will definitely perform better in the battles and engagements. However, under adverse air situation, should Bangladesh Army fight a linear battle to offer lucrative concentrated targets to the enemy air or they should fight in small groups with non-linear front? If US Army can resort to ‘team of teams’, Bangladesh Army also should not plan to fight in big groups.

Infantry Battalions

Desired Capabilities. Infantry Battalions are the core fighting units of Bangladesh Army and they will remain important in future wars also. They need to adapt with the changing scenario. Age-old concept of fighting, weapons, and structure will have to be changed to meet the future threats. In addition to the weaknesses identified in this research, some of the

desired capabilities were also proposed by the researcher. The respondents also agreed with most of the options.



Proposed Organization of an Infantry Battalion

An infantry battalion may be restructured in many ways. Two broad options are feasible for Bangladesh Army:

Model 1: Adding additional capabilities with existing organization, 4 x Rifle Company (4RC) Model.

Model 2: Replacing men with machines to reduce the manpower and increase the capabilities, 3 x Rifle Company (3RC) Model.

With 4RC Model, it is very difficult to add new capabilities without increasing the manpower. 3RC Model gives flexibility in terms of inclusion of new capabilities. It may be argued that, for basic defensive framework, an infantry battalion needs to be deployed with four companies which allows the CO to launch local counter attack with his committed reserves. In case of 3RC Model, this option will be difficult to execute. As a counter argument, it may be expressed that, the era of trench warfare of WW I & WWII is over. Future wars will be more complex, volatile, fast, and mostly non-linear. Unless the army adapts new technologies and tactics, it cannot

win against the enemy. Therefore, 3RC model is considered as feasible option in this research.

New Inclusions. The units will be equipped with:

- ISR capabilities with drones/UAV.
- Night vision and night fighting capabilities.
- Head to head communication system.
- MANPAD missiles.
- Light and accurate anti-tank weapons.
- Vehicles with cross country mobility.
- IEDs/explosive handling capabilities.

Rationale for Changes

Existing Intelligence Section (6 persons) in Battalion HQ can be integrated with ISR Sec (10) which will be led by an officer. This sec will have required ISR capabilities and will be equipped with BFSR, Drones, and UAV etc.

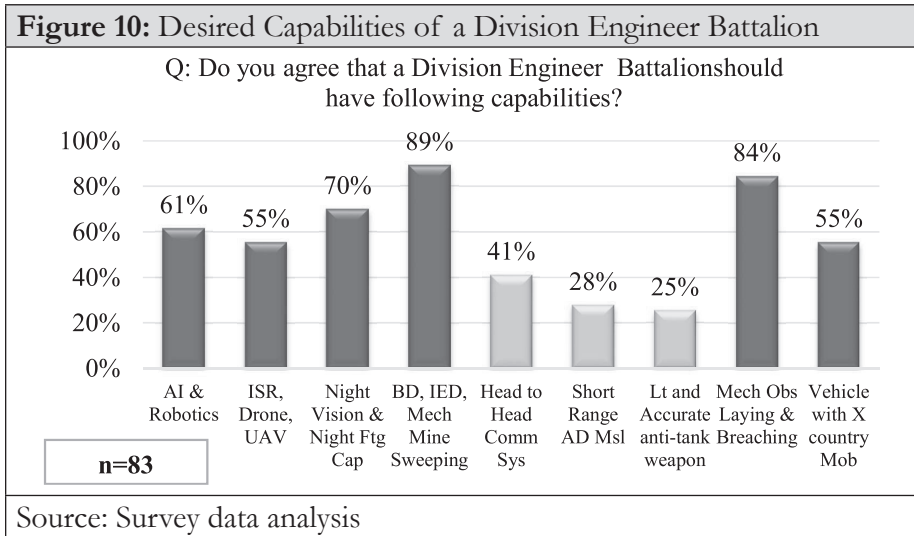
Total 15 persons is increased in Assault Pioneer/Specialist Platoon. Existing platoon with 17 personnel has very limited capability to support the unit. This platoon can be organized with a Platoon HQ (3) and 3 x Sections (3 x 10). This platoon as one team will be able to provide limited combat engineering support to the unit. At the same time, each section can be grouped with each Rifle Company while fighting independently.

MANPAD Missile Section with 15 manpower is proposed for the unit. Though the primary responsibility of AD will remain with BAF, the question remains how long this force will be able to sustain against India. Even if BAF fails to achieve any kind of control of air, Bangladesh Army will have to continue fighting under adverse air situation. This section will be a deterrence for enemy air.

Administrative personnel (e.g. clerks, runners) may be reduced after detail analysis on tasks and responsibilities of every individual of the unit.

Division Engineer Battalions

Desired Capabilities. Division Engineer Battalions operate across the length and breadth of the battlefield and support all arms and services. In the terrain of Bangladesh, engineer support is crucial for every operation. Capabilities which need to be included are identified in Figure 10.



New Inclusions. The units will be equipped with:

- Modern fast bridging capability.
- BD, IED, and mechanical mine laying equipment.
- Mechanical mine breaching capabilities.
- Operational track laying capability.
- Advanced communication system.
- Vehicles with cross country mobility.
- Light and accurate anti-tank weapons.
- ISR capabilities with drones/UAV.
- Night vision and night fighting capabilities.

Proposed Organization of Division Engineer Battalion

Division Engineer Battalion can be reorganized in two ways:

- Dividing the units into two different units; Combat Engineer Battalion (3 x Fd Coy) and Specialized Engineer Battalion (Plant and Bridge Coy).
- Reduction of manpower from existing unit and increase the capability.

Option 2 is taken for this research.

Rationale for Changes

Existing Intelligence Section will be reorganized as ISR Section with same manpower and led by the Recce Officer. This section will operate drone/ UAV for ISR. Field Companies will have 3 x platoons (3 x 35) and each platoon will have 3 x sections (3 x 10) instead of 4 x sections (4 x 12). Incorporation of mechanical mine laying and breaching equipment will allow the companies to perform their jobs faster. Expedient Platoon (21) of Plant Company may be discarded due to not having operational role in present day context. It was required in British Indian Sapper Units.

Implementation Process

The restructuring concept worked out in this research is not all inclusive. The implementation process is suggested as follows:

Phases. The reorganization may be done in 3 phases:

Ph 1: Short Term (2021-2023)

- Detail study on restructuring by ARTDOC and finalize the TO&E.
- Approval from the Government.
- Newly raised units may start reorganizing as per new proposal.
- Research on modification in training and doctrine should start immediately.
- Procurement process should initiate.

Ph 2: Mid Term (2024-2026)

- All units should be reorganized as per new TO&E.
- Priority procurement of weapons and equipment should be completed.
- Transfer of technology should be done to enhance indigenous production capability.
- Units and formations should conduct training as per modified doctrine.

Ph 3: Long Term (2027-2030)

- All the units/outfits of Bangladesh Army will be equipped with desired capabilities.
- Units and sub-units will be expert on operational tasks.
- Indigenous production capability of defence hardware will start to flourish gradually.

Recommendations

In this research, a detail analysis is carried out on the fighting power of the units of Bangladesh Army and restructuring is suggested for Infantry and Division Engineer Battalions. Basing on the research following recommendations may be made:

- Units of Bangladesh Army may be reorganized as per proposed structures and implementation plan as outlined in this research.
- A complete restructuring package may be undertaken by the Army and detail study may be carried out by ARTDOC.
- All kinds of ineffective training systems should be modified immediately. Skill oriented, effect based, small group and sub-unit level operational training should be introduced in Bangladesh Army which will ensure ‘fight to win’.

Conclusion

Armed Forces are made to fight wars; safeguarding the nation's vital interests from threat is their core responsibility. Bangladesh Army as a part of Armed Forces is primarily responsible for maintaining the territorial integrity of the country and defeat any venture by the adversaries. When it will be necessary to fight, Bangladesh Army must fight to win. This winning mind-set will drive the Army to remain operationally aggressive, fit, and agile. Character of warfare changes with time; tactics and technics of WW I and WW II may not hold good for future warfare. Now it is the age of technology; warfare has become highly complex. AI, Cyber, Space, Hybrid warfare have changed the theory and concept of warfare to a great extent. Therefore, Bangladesh Army needs to adapt with the ever changing dynamic situation. Existing large units with limited fighting power are good for non-operational tasks but not worthy for future battles. A revolution in military affair is required to restructure all the units of Bangladesh Army and their ways of fighting which is a big challenging task.

It is well established that the existing units of Bangladesh Army do not possess desired fighting power. Considering the future operational and battlefield environment it is clear that existing larger units with very limited capabilities will not be able to defeat the enemy. The concept of employment of the units in combat also needs to be reviewed. More capable smaller units will definitely perform better in the battles and engagements. The concept of 'team of teams' may be applicable for infantry units. Infantry battalions with three Rifle Companies and added capabilities are likely to perform better than existing larger units which always remain understrength. The Division Engineer Battalions may be restructured by reducing extra manpower and introducing mechanization. Mechanical mine laying and breaching will save lots of time and reduce the requirement of extra manpower. Robotics may be utilized in performing many combat engineering tasks like counter IED, bomb disposal etc. Fast moving bridging equipment will enhance the bridge laying capability of the units to a great extent.

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PSYCHOLOGICAL OPERATIONS BY BANGLADESH ARMY IN CHATTOGRAM HILL TRACTS: CHALLENGES AND WAYS TO INTEGRATE ELEMENTS OF NATIONAL POWER IN CONFLICT RESOLUTION

Lieutenant Colonel Golam Mohiuddin Haider, afwc, psc, Inf

Introduction

Bangladesh Army is deployed under the mandate of ‘Operation UTTARAN’ to ‘Maintain stable security environment in Chattogram Hill Tracts (CHT) with a view to assisting Government of Bangladesh (GoB) and other agencies in implementing the peace accord’. Presently, Bangladesh Army is conducting conventional form of tasks along with limited Psychological Operations (PsyOps) in CHT to create an environment of peace and security in the region. On the contrary, propaganda campaign of the Ethnic Minority Groups (EMGs) appears to be more effervescent than that of ongoing PsyOps activities of Bangladesh Army and other GoB agencies.

The regional political parties in CHT with the support of their armed groups, foreign diaspora, vested local intellectuals and various international organizations, are carrying out ill motivated propaganda crusade against GoB as a whole and Bangladesh Army in specific in order to materialize their conferred agendas. Foreign Diplomatic missions of Bangladesh often seem not organised in countering any propaganda activity by the EMG sympathizer groups conducted at any foreign soil. The EMGs propaganda activities desperately attempted to generate sense of commotion and sense of disintegration amongst the common mass in the overall milieu of CHT is likely to have deleterious insinuations on the peace and security of the region, if not addressed with urgency (Islam, 2018).

Although various ‘elements of national power’ of Bangladesh had been working since long in solving such complex phenomenon of CHT, presence of instability, discontent, complexity etcetera in the region justifies that the employed efforts were not at all synchronized, coherent or integrated. Absence of synergy prevails amongst various ‘elements of national power’ that are mostly disjointed and not meeting the ultimate objective of conflict resolution. It merits an ‘Integrated Wholesome Approach’ which is all encompassing, taking on board all stakeholders of various ‘elements of national power’ like geography and natural resources, population and popular support, good governance and rule of law, diplomacy, economy, military strength, information and media etcetera. Therefore, considering the reality and the ongoing ill-motivated propaganda campaign of the EMGs and the vested quarters, it has now become vital to reinforce the PsyOps effort of Bangladesh Army through methodical integration of various ‘elements of national power’ of Bangladesh in the ultimate conflict resolution of CHT.

Review of the Literatures

There are studies on CHT affairs having significant focus on the concerns of implementation progress of the peace accord and suggested ways for lasting peace and security. Interestingly, there are very few research on PsyOps activities or propaganda campaign in CHT prevailing now. The propaganda activities of the EMGs are aiming to segregate the psychological domain of the population residing in CHT into two distinct and dissimilar ethnicities i.e., Bangalee versus EMG, which is again based on geography i.e., plains versus hills. EMGs are always evolving around few unresolved issues of CHT Peace Accord-1997 i.e., issues of land, identity quandary, non-implementation of peace accord, and withdrawal of Security Forces (SF) camps from the hilly terrains to earn sympathy in national and international arenas (Haider, 2017).

Vested EMGs are specially pursuing the youths of CHT, educated domain of the country and some specific foreign audience through cyber space,

electronic and print media as well. Propaganda activities of the regional EMG based political parties are intimately shadowed by armed activities, toll collection, killing, and kidnappings etcetera which have ultimate implications in the conflict resolution of CHT' (Islam, 2018).

CHT being peculiar in demography and physical features, every issue has multi-dimensional effects and involvement of different stakeholders. As such, not a unilateral isolated approach but an integrated approach is likely to have the desired and sustainable solution (Rouf, 2014).

Methodology

A 'Qualitative Study has been endeavoured to establish a cross-sectional study with causal relationship designed between the dependent (PsyOps Effort in CHT) and independent variables (Elements of National Power). Here, 'Integration of Elements of National Power' has been identified as the presumed 'cause' and the 'Enhanced PsyOps Effort in Conflict Resolution of CHT' has been considered as the assumed 'effect'. It followed an analytical methodology based on both primary and secondary sources of information.

Results

The paper analysed the effectiveness of ongoing PsyOps activities by Bangladesh Army and GoB agencies on contrary to the propaganda campaign of the EMGs. Subsequently, it evaluated two case studies related to PsyOps on Malayan and Sri Lankan insurgency. Thereafter, it explored the ways and means to integrate various 'elements of national power' in the overall PsyOps effort of CHT. Furthermore, it identified the likely challenges of such integration and suggest plausible measures to develop an 'Integrated Approach' towards CHT conflict resolution. The research has policy connotations; however, it is anticipated to contribute to a great extent to the overall PsyOps scenario of CHT. This research also has significant potentials for consideration at the strategic, military strategic and operational level.

Psychological Operations by Government of Bangladesh Agencies and Bangladesh Army versus Propaganda Campaign of Ethnic Minority Groups in Chattogram Hill Tracts

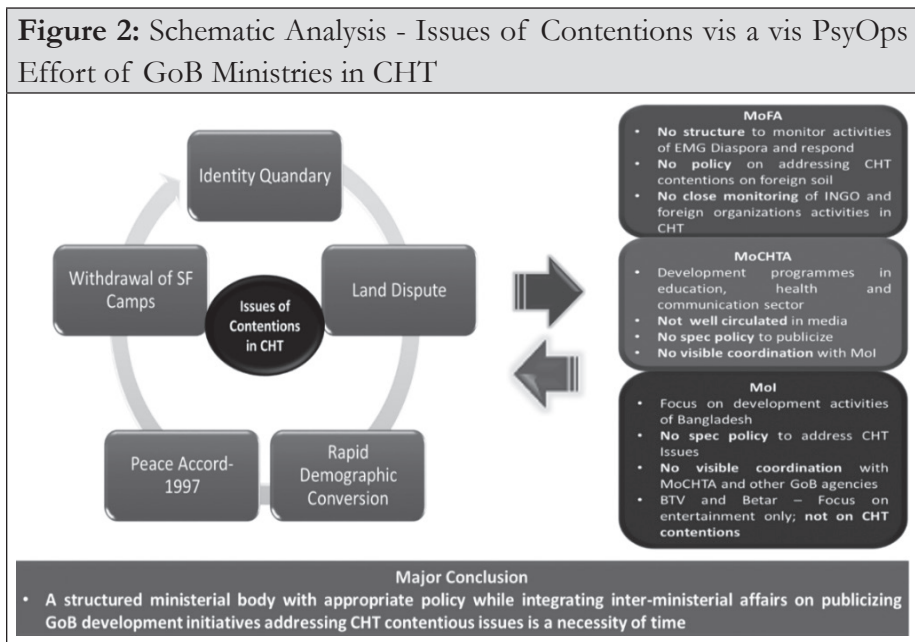
PsyOps by GoB Agencies and Bangladesh Army

Ways, Means and Methods Used by GoB Agencies and Bangladesh Army
Various ways, means and methods being implemented by GoB and Bangladesh Army are shown in Figure 1:



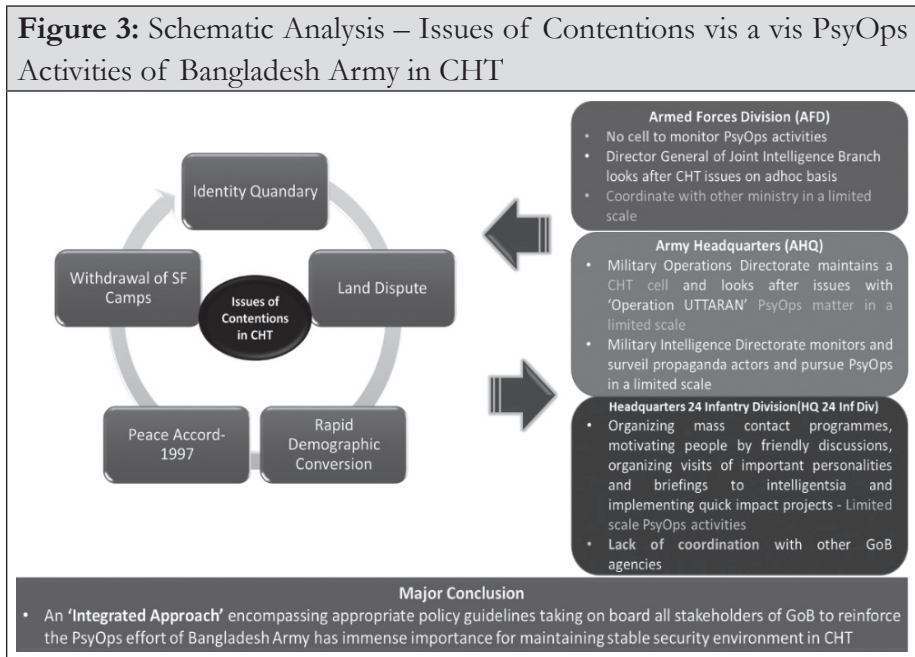
PsyOps by GoB Agencies Ministry of Chattogram Hill Tracts Affairs (MoCHTA) has put significant prominence on the overall development in CHT, which is mirrored through its annual budget. Nevertheless, all these development activities are not well broadcasted in the media. Currently, MoCHTA does not pursue any clear policy guidelines to publicize GoB development initiatives in CHT through public media. Presently, Ministry

of Information (MoI) also does not follow any policy directive specifically regarding CHT. Consequently, despite having huge development activities, the broad picture of positive initiatives of GoB remain unnoticed to the common mass of CHT. Better harmonisation among MoI, MoCHTA and other relevant agencies is essential for publicizing development activities of GoB in CHT. On the other hand, it is also challenging for Ministry of Foreign Affairs (MoFA) to monitor the activities of the IOs/INGOs working in the remote parts of CHT. A schematic analysis on the issues of contentions vis a vis PsyOps effort of GoB ministries in CHT has been illustrated in Figure 2:



PsyOps by Bangladesh Army. There is no organised structure for the conduct of PsyOps in CHT at the military strategic level. However, Military Operations Directorate in coordination with Military Intelligence Directorate maintains a 'CHT cell', which is actually looking after the PsyOps matters at the moment in the name of 'MO & MI Working Group Meeting on CHT' in every quarter since 2017 to share and coordinate mostly intelligence inputs and outputs. At the operational and tactical level,

the PsyOps section of Headquarters of 24 Infantry Division is assigned for carrying out PsyOps activities through its deployed brigades and units in CHT. A schematic analysis on the issues of contentions vis a vis PsyOps effort of Bangladesh Army in CHT has been exemplified in Figure 3:



Objectives of EMGs Propaganda Campaign Analysing the trends of propaganda activities of EMGs, the objectives can be described in following ways:

- Firstly, to tarnish the image of Bangladesh at home and abroad;
- Secondly, to malign the reputation of Bangladesh Army;
- Thirdly, to deteriorate law and order situation;
- Fourthly, to damage peace and stability while to create division amongst the local inhabitants;
- Fifthly, to worsen the EMG-Bangalee harmony,

- Sixthly, to recruit political and military members for the EMG parties;
- Seventhly, to create own sphere of influence; and
- Lastly to serve small petty group interests of the EMGs.

Ways-Means-Methods, Tools and Reach Used By EMGs and GoB Agencies. A tabular analysis on ways-means-methods, tools and reach used by EMGs and GoB Agencies is presented at Table 1:

Reach of EMGs Propaganda	Tools Used by EMGs	Ways-Means-Methods Propaganda vs PsyOps	Tools Used by GoB	Reach of GoBs PsyOps Effort
• World-Wide • Nation-Wide • CHT	• Pro-active • Vibrant • Active operator / sympathizer World-Wide	• Cyber Space/Social Media	• Re-active • Needs improvement • Limited operators • Less expertise	• Limited nation-wide spread
• World-Wide • Nation-Wide • CHT	• Published both from home and abroad	• Article in Print Media	• Seldom	• Limited nation-wide spread
• World-Wide • Nation-Wide • CHT	• Numerous books and publications both from home and abroad	• Book and Other Publication	• Very rare	• Very limited nation-wide spread
• World-Wide • Capital City • CHT	• Being conducted both at home and abroad	• Seminar, Conference, Press-Conference etc.	• Very rare	• Very Limited nation-wide spread
• World-Wide • Nation-Wide • CHT	• Aired during special days (World's Indigenous Day, Peace-Accord Anniversary etc)	• Interview, TV Talk show etc.	• Very rare	• Very Limited nation-wide spread
• World-Wide • Capital city • CHT	• Often conducted in CHT, Dhaka or in abroad by Diaspora	• Procession, Human Chain, Rally etc.	• Not applicable	-
• World-Wide • Capital city • CHT	• Normal phenomenon for round the year	• Banner, Poster, Leaflet, Festoon etc.	• Very rare	• Very Limited nation-wide spread

Effectiveness of EMGs Propaganda Campaign. EMG actors involved in propaganda campaign are found to be ardent and effective in conducting their activities through corresponding narratives. They are well knitted and coordinated in pursuing various issues from respective domain through social media, propaganda literature and maintaining personal link. On the other hand, PsyOps effort of GoB seemingly not well bonded and could not create substantial influence among the general mass of CHT.

The Voids and Weaknesses in the Existing PsyOps Effort. Analysing EMGs propaganda, voids, weaknesses and gaps in existing PsyOps effort in CHT have been identified and displayed in Table 2:

Table 2: Voids, Weaknesses and Gaps in the Existing PsyOps Effort in CHT	
Categories	Voids, Weaknesses or Gaps in the Existing PsyOps Effort in CHT
Voids of GoB Agencies	<ul style="list-style-type: none"> • 'Perception Management' • 'Lead Role Syndrome' • 'Bureaucratic stature' • No clear strategic aim or objective • Mostly reactive PsyOps activities • No comprehensive plan to disseminate information regarding past, ongoing and projected development activities in CHT • Rarely utilize radio, TV, publications, motion pictures etc. for PsyOps purpose • Strategy of '<i>Silence</i>' or '<i>Delay Battle</i>' in countering propaganda • Ignorance about national interests in CHT affairs • Lack of key communicators to propagate and broadcast initiatives taken by GoB for development and security in CHT • No 'Center of Gravity' has been identified or defined for ongoing PsyOps effort in CHT
Common Voids	<ul style="list-style-type: none"> • Incoherent PsyOps efforts without much of gains • Sufficient and confirmed data not available regarding EMG decision makers, their source of political power, source of fund, propaganda structure etc. • Pacification programmes of GoB do not match aspirations of the local people • No analysis of demographic characteristics of the area rather cumulative basis PsyOps being planned
Weaknesses of BD Army	<ul style="list-style-type: none"> • Operating at tactical level, hence pursuing PsyOps activities with lesser impact • Persuading PsyOps affairs almost single handedly • Other PsyOps techniques like direct refutation, indirect refutation, diversion etc. are rarely used

Integration of Elements of National Power in Enhancing Psyops Effort of CHT Conflict Resolution

Case Study-1: Malayan Insurgency (1968-1989). Analysis of the Malaysian Success in CIO (Lt Col Ajaya Kumar, 2009) is displayed at Table 3:

Table 3: Malaysian Success of PsyOps Effort in CIO

Malaysian Insurgency (1968-1989)	
<p>Malaysia's First Emergency (1948-1960) Lessons Learnt:</p> <ul style="list-style-type: none"> • <i>Firstly:</i> Military alone cannot bring any results • <i>Secondly:</i> Security and development should go hand-in-hand 	<p>Approach during Second Emergency (1968-1989)</p> <p>Malaysian government streamlined Internal Security (IS) together with Internal Development (IDEV) programmes</p>
<p>Integration of Elements of National Power</p> <ul style="list-style-type: none"> • Pursued '<i>Whole of Government Approach</i>' • Not restraining to military operations only but also incorporated political, social, economic, administrative, policing and other measures • Formulated '<i>KESBAN</i>' Strategy, an acronym derived from the Malay words '<i>Keselamatan dan Pembangunan</i>'; i.e. 'Defence and Development' 	<p>Crux of 'KESBAN' Strategy</p> <ul style="list-style-type: none"> • The sum total of all measures undertaken by the Malaysian Armed Forces and other government agencies to strengthen and protect society from subversion, lawlessness and insurgency • <i>Political</i> reforms • <i>Economic</i> and social development • <i>PsyOps</i> to prevent insurgents' propaganda • <i>Public relations</i> activities • <i>Effective security force</i> • Three main components, balanced development, mobilization and neutralization

Case Study-2: Sri Lankan Insurgency (1983-2009). Analysis of the Sri Lankan success in CIO (Peter Layton, 2015) is illustrated in Table 4:

Table 4: Sri Lankan Success of PsyOps Effort in CIO

Analysis of Sri Lankan Insurgency (1983-2009)	
<p>Lessons Learnt</p> <ul style="list-style-type: none"> • Firstly: Redefining Strategic Objectives • Secondly: A comprehensive Grand Strategy • Thirdly: Astute Tactics to formulate a Military Strategy 	<ul style="list-style-type: none"> • Redefined Strategic Objective: Changing its strategic objective, <i>from negotiating with the LTTE to annihilating it</i> • Comprehensive Grand Strategy: Combining diplomacy, economics, military actions, and information operations, and considers overall development • Not to continue with 'barely focused military strategies but to adopt a comprehensive whole-of-nation grand strategy to guide lower-level activities • Astute Tactics to Formulate a Military Strategy • To meet the ends that the grand strategy seeks, the focus of the lower-level, subordinate military strategy needed to be exploiting the enemy's weaknesses while countering its strengths • Capitalizing LTTE Defection • Countering LTTE Suicidal Threats • Attack LTTE and force them to defensive posture • Small Groups Operations using Swarm Technique

Prospects of ‘Elements of National Power’ for Bangladesh in Enhancing PsyOps Effort of CHT Conflict Resolution. Understanding ‘elements of national power’ for Bangladesh is an important facet not only for military but also for policy makers and stakeholders of GoB. After analysing the ‘elements of national power’ utilized by two of our regional states; considering interview answers and survey analysis for PsyOps effort of CHT it was revealed that for Bangladesh the ‘elements of national power’ would include geography, popular support, good governance, diplomacy, economy, military strength, information and media.

A crux of analysis on ‘Elements of National Power’ of Bangladesh, their applicability and prospects in overall CHT PsyOps effort has been chronicled in Table 5:

Table 5: Prospects of Elements of National Power for Bangladesh and Applicability in CHT PsyOps Effort

Elements of National Power for Bangladesh in CHT PsyOps Effort	Applicability and Prospects
Geography & Natural Resources	<ul style="list-style-type: none"> • CHT has immense potentials to contribute significantly to national economy • Gifted with vast natural resources, forest and mineral resources • Suited for tea and rubber plantation, and fruits gardening, developing fisheries and other water-related projects, ideal pastoral ground for developing livestock • Great prospect for developing tourism industry • Good communication infra-structures needed to reap benefit out of <i>geography and natural resources</i>
Population and Popular Support	<ul style="list-style-type: none"> • Population and popular support is vital to pursue any common national goal • Prime focus for CHT should be to propagate importance of being 'Bangladeshi' and national hegemony while acknowledging 'Unity in Diversity'
Good Governance and Rule of Law	<ul style="list-style-type: none"> • Good Governance and 'Rule of Law' has crucial importance • Progress is seen in case of human resource development, social development, women empowerment, poverty alleviation and improving living standard in CHT • To establish a long lasting peace 'Rule of Law' in the region is a necessity
Diplomacy	<ul style="list-style-type: none"> • MoFA represents Bangladesh to foreign governments and international organizations through 72 diplomatic missions across the globe • Pursues external economic and trade interests, promotes culture and disseminates information to foreign countries • Rich culture and heritage of CHT can be projected through MoFA in the foreign soil

Continued ...

Elements of National Power for Bangladesh in CHT PsyOps Effort	Applicability and Prospects
Economy	<ul style="list-style-type: none"> • Socio-economic development of EMG in CHT should be given vital importance by GoB • All CHT inhabitants to be provided with arable lands for agriculture and settlement • Cooperative efforts and marketing facilities should be ensured to make agro-forest based businesses viable • GoB's multi-dimensional initiatives should be pursued vigorously encompassing all stakeholders
Military Strength	<ul style="list-style-type: none"> • SFs in CHT is an enormous strength and projection of national power for GoB • SFs organize free medical campaign, midwifery training, eye camp, awareness on general health and hygiene and so on. • SFs contribute in various educational programme like 'Pathshala Program' • SFs promote religious, cultural and social events to pursue social bonding and harmony within CHT inhabitants • ECBs construct useful roads and bridges in the remote areas of CHT
Information and Media	<ul style="list-style-type: none"> • A vital facet in for GoB is <i>information and media</i> • All national dailies, 12 local newspapers, and all private TV channels have their representatives in CHT • Viewers can also watch any other cable / satellite based news channels like BBC, CNN, Al-Jazeera etc. • Inhabitants of CHT also enjoying cellular network facilities • Although EMG propagandists use this element for their gains, GoB agencies yet to use its full potential considering overall PsyOps effort

Challenges to Integrate Elements of National Power and Ways Forward

Challenges to Integrate Elements of National Power

An analysis on challenges to integrate 'elements of national power' in Bangladesh while enhancing the PsyOps effort in CHT conflict resolution has been enumerated in Table 6:

Table 6: Challenges to Integrate Elements of National Power

Issues Related to Elements of National Power	Challenges of Integration in to PsyOps Effort
Perception of GoB Agencies about PsyOps Activities	<ul style="list-style-type: none"> • A 'grey area' for GoB agencies • Not discussed or mentioned in any Ministerial Rules of Business • 'Lead Role Syndrome' and bureaucratic posture • Mostly town centric activities
Peace Accord versus Constitution of Bangladesh	<ul style="list-style-type: none"> • Contradictory clauses act as predicament in creating uneven class of people in the multi-ethnic society • Unawareness of general mass about the progress of implementation of Peace Accord
'Political Will' versus 'Silent Strategy' of GoB	<ul style="list-style-type: none"> • Absence of main stream political parties' activities • Regional political parties engaged into power politics • Apt responsiveness of GoB versus other important issues of country
Involvement of Diplomatic Mission	<ul style="list-style-type: none"> • No cell in MoFA to conduct appropriate counter propaganda measures • No policy guidelines on PsyOps activities
Good Governance and Rule of Law	<ul style="list-style-type: none"> • Lack of transparency in mechanisms of information gathering, storage, dissemination and retrieval • No functional structure of bottom up reporting and top-down supervision - system of accountability • Brittle rule of law thwarting socio-economic development • Effectiveness of political institutions
Media and ICT Law	<ul style="list-style-type: none"> • Easy reach of media in CHT • Media reports biased towards EMG cause • Law enforcing agencies yet to attain capability to impose ICT law
IOs, NGOs and Intellectuals	<ul style="list-style-type: none"> • IOs and NGOs rendering tacit support and pursuing malicious agenda • Prominent intelligentsias compassionate to the EMG cause
Unified Structure to deal CHT issues	<ul style="list-style-type: none"> • Disjointed, not all-encompassing, incoherent efforts of GoB - not meeting ultimate objectives of conflict resolution of CHT • No unified body or structured organization to pursue an 'Integrated Wholesome Approach' by GoB

Ways Forward to Mitigate Challenges of Integrating 'Elements of National Power' while Enhancing the PsyOps Effort in CHT Conflict Resolution. Ways to mitigate the challenges of integrating 'elements of national power' while enhancing the PsyOps effort in CHT conflict resolution would merit strategy formulation to deal with such multifaceted issues. Again, strategy is the complete package of ends, ways and means of a problem. However, there are issues which may not remain stable

and would require different approach. In order to identify the parameters of problem solving and strategy formulations, a comprehensive SWOT analysis in the context of CHT has been listed in Table 7:

Table 7: SWOT Analysis to Identify Parameters of Challenge Mitigation

Strengths	Weaknesses
<ul style="list-style-type: none"> • Rich natural resources • Diverse geography • Balanced demography • Multiple ethnicities • Peace Accord progress • Political integration • Social integration • Socio-economic development 	<ul style="list-style-type: none"> • Rough terrain • Absence of effective governance • Enforcing Rule of Law • Re-active Diplomacy • Absence of main stream politics • Porous borders with neighbours • Mistrust between EMG and Bangalee • Lack of media support
Opportunities	Threats
<ul style="list-style-type: none"> • Wholesome Integrated Approach • Common platform for all stakeholders • Natural tourism potential • Infra-structural development and road network • Ethnic and cultural diversity • Developing 'Bangladeshi' Brand in diplomatic domain 	<ul style="list-style-type: none"> • EMG propaganda campaign • Insurgency in neighbouring countries • Influence of adverse spoilers • Interest of vested quarters • Regional political rivalry • Emaciated insurgency • Dream of autonomy & 'Swadhin Jummland'

Plausible Measures for GoB Agencies while Re-Invigorating Overall PsyOps Effort in CHT

In this connection, following measures may be considered by respective GoB agencies with a view to countering propaganda campaign by the EMGs and their sympathizers; at the same time revamping overall PsyOps effort of CHT:

Formulating and Implementing Policy Guidelines. The ‘DRAFT PsyOps Policy for CHT’ already devised by Bangladesh Army should be made operational at the earliest. Concerned GoB ministries and organizations including Bangladesh Army should work in harmony under one umbrella in close coordination with each other for an effective PsyOps effort in CHT.

Inclusive Development Strategy for CHT. GoB has taken various development initiatives to raise CHT as one of the unique tourist destinations of Bangladesh. As Bangalee communities constitute almost half of the population in CHT, inclusion of both Bangalee and EMG persons into overall development work would bring more harmony and peaceful coexistence in CHT for sure.

Preserving and Promoting Cultural Diversity of EMG. GoB agencies should initiate widespread program encompassing all EMGs both inland and CHT living, highlighting the theme of 'Unity in Diversity' in different places including electronic media. GoB and SF should patronize socio-cultural programs of EMG and Bangalee alike with a view to fostering cultural affinity and communal harmony. Peaceful co-existence amongst ethnicities should prevail in CHT at all cost. This should be implemented through rigorous political and cultural interaction with all stakeholders of CHT.

Means of Conducting PsyOps. Significant portion of PsyOps activities should be pro-active by the GoB agencies. PsyOps narratives should be broadcasted utilizing all possible mediums like cyber-space, radio, TV, print media, motion pictures etc. Propaganda campaign by the EMG in the open source should be monitored constantly and should be blocked/countered at the earliest. Visual documentary, based on real history of CHT with positive message may be portrayed in the form of telefilm, art film, documentary, drama, music video etcetera. In those films, life style of EMG including their culture and tradition, sacrifice of SF members, update on contentious issues may be projected. Even commercial films with optimistic messages may also be made. MoI in coordination with MoCHTA may render necessary direction to the concerned authorities in this aspect.

Implementing ICT Act and Disguised Media Control. GoB machineries often found less interested to engage with media thus allowing almost a free run to the vested groups in carrying out propaganda campaign against GoB and SF. For example: 'Kalpana Chakma abduction'

and 'Indigenous Day' are observed every year by the EMG; whereas very less effort has been seen to celebrate 'Peace Accord Anniversary' or even 'Independence Day' and 'Victory Day' of Bangladesh. Moreover, ICT law-2006 should be effectively enforced by SF regarding CHT affairs.

Intelligence Collection, Collation and Dissemination vis-à-vis Refuting Hostile Propaganda. All intelligence agencies should remain updated and inter-connected regarding the activities of hostile EMG propagandists. Sources like websites, electronic and print media etc. should be monitored and necessary information should be collected, collated and disseminated to concerned agencies and organisation for further action at the earliest. On the other hand, many a times, GoB agencies pursue the technique of 'Silence' while countering propaganda. Sometimes, techniques like direct refutation, indirect refutation, diversion etc. may also be ventured considering appropriateness and applicability of time and space.

Incorporating CHT History in National Education Curriculum. The authentic history of CHT should be incorporated in the national education curriculum especially in secondary and higher secondary textbooks. Steps may be taken by GoB to publicize history of CHT written by famous writers in other languages too.

Frequent Visits by GoB Officials and Intellectuals to CHT. In order to understand the 'Psychology' of EMG, visits should be arranged for intellectuals, media personnel and diplomats at a regular interval to the remote areas of CHT. Ministers, GoB high officials should also visit distant areas of CHT to enhance the confidence level of the locals on GoB.

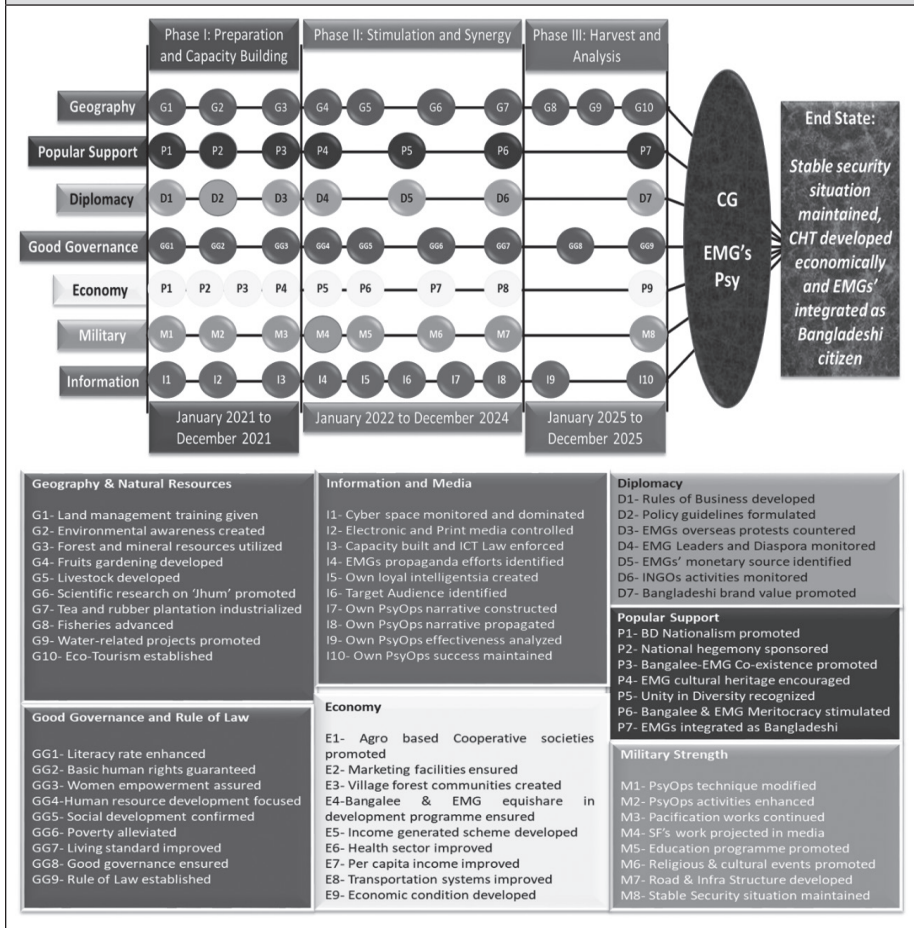
Developing 'Eco-Tourism' in CHT. CHT should be transformed into an 'Exclusive Eco-Tourism Zone' for the socio-economic uplift of the region. GoB at present is taking good initiative to preserve EMG culture and heritage along with creating job opportunities to boost up the overall economy of the area.

Reviewing Discriminatory Tax Amenities for EMG. In 1984, due to the economic drawback of EMG, GoB offered tax amenities as per the 'Clause 27 of Part A, 6th Schedule of Income Tax Ordinance 1984'. However, presently, the scenario does not exist. There are many EMG personnel capable of paying tax and should contribute to the development of the country. Clause 27 of Part A, should be reviewed and well-off EMG persons should be brought under taxation scheme.

Creating 'Bangladeshi Brand' Value Using Diplomatic Good Office. MoFA should create a cell to conduct effective counter propaganda measures to safeguard Bangladeshi interests in the foreign soil. If EMG diaspora dares to conduct any propaganda campaign to malign the image of GoB or SF, diplomatic missions abroad should be able to counter the propaganda activities instantly utilizing the 'Good Diplomatic Office' thus creating an effective 'Bangladeshi Brand' value. This will be a milestone step in overall PsyOps effort of GoB.

An 'Integrated Wholesome Approach' to Incorporate 'Elements of National Power' in Overall Psyops Effort of CHT. PsyOps in CHT should be planned holistically involving all concerned apparatus of GoB. 'Elements of National Power' should be utilized to pursue an 'Integrated Wholesome Approach' within overall PsyOps gamut of CHT. A 'Five Years Integrated Plan for CHT: 2021-2025' in subsequent schematic (Figure 4) has been suggested to be pursued in total 7 'Lines of Effort' (depicting 'elements of national power') for an effective PsyOps strategy targeting EMGs of CHT. Here, the researcher considered 'EMGs' Psychology' as the 'Centre of Gravity' (CG) and a total of 60 'Decisive Points/Conditions' in three phases as shown in round shapes in order to achieve the desired 'End State' i.e. 'Stable security situation maintained, CHT developed economically and EMGs' integrated as Bangladeshi citizen'.

Figure 4: PsyOps Schematic showing possible End State, Centre of Gravity and Decisive Points/Conditions of Overall PsyOps Effort in CHT Conflict Resolution



Suggested 'Unified Structure of National Committee for CHT Affairs (NCCHTA)'. In pursuance to the PsyOps Schematic mentioned above, a proposed organizational structure in support of maintaining synergy in various 'Lines of Effort' naming 'National Committee for CHT Affairs' i.e., NCCHTA has been proposed by the researcher, where Minister, MoCHTA being the Convener will have members from all relevant ministries and other GoB agencies including SF representation as shown below in Figure 5. Detailed modus operandi of NCCHTA may

Recommendations

In this study, the researcher has ventured to visualize the existing core contentions in regards to CHT conflict resolution with a different perspective. Although Bangladesh Army is an important actor in this whole gamut, relevant GoB agencies are crucial and inevitable while integrating ‘elements of national power’ in pursuant to the enhanced PsyOps effort of CHT and as such, following recommendations are made:

- AFD may pursue appropriate GoB ministry/ministries to implement ‘Five Years Integrated Plan for CHT’ while incorporating relevant ‘elements of national power’. (Policy level recommendation)
- AFD may pursue a ‘Unified Ministerial Structure’ namely ‘National Committee for CHT Affairs’ (NCCHTA) under ‘National Committee for Security Affairs’ (NCSA) in order to synchronize the overall PsyOps effort of relevant GoB agencies. (Strategic and Military Strategic level recommendation)
- Bangladesh Army may implement the ‘DRAFT Comprehensive PsyOps Policy’ along with relevant GoB agencies in order to maintain harmony and coordination amongst each other for an effective PsyOps in CHT. (Operational level recommendation).

Conclusion

Presently, there is no structured PsyOps activities for CHT at national level. MoCHTA is conducting massive development activities in CHT but are not well circulated as it lacks policy guidelines to publicize GoB development initiatives through public media. MoI does not have any strategy directives regarding broadcast of CHT affairs through various media platforms. MoFA has neither any mechanism/ Rules of Business to monitor EMG diaspora activities on foreign soil nor can follow INGOs and IOs activities in CHT. Therefore, a ‘unified ministerial body’ with appropriate policy guidelines integrating inter-ministerial affairs on

publicizing GoB progressive initiatives while addressing CHT contentions is a requirement of time.

At the military-strategic level, Armed Forces Division does not have any structured cell to monitor CHT PsyOps activities, however maintains coordination with relevant ministries. On the other hand, Military Operations Directorate in coordination with Military Intelligence Directorate maintains a small CHT cell. At the operational and tactical level, PsyOps section of Headquarters 24 Infantry Division has been conducting PsyOps activities through its deployed brigades and units in CHT in a limited scale. Seemingly, incoherency and lack of synergy between GoB agencies and Bangladesh Army exist in countering EMGs' effervescent propaganda activities in CHT. Therefore, an 'Integrated Wholesome Approach' has been felt necessary incorporating appropriate policy options taking on board all stakeholders of GoB to strengthen the overall PsyOps effort in CHT.

On the contrary, propaganda activities of EMGs have been targeting the psychological domain of the inhabitants residing in CHT dividing into two distinct and dissimilar ethnicities i.e. Bangalee versus EMG. Few unresolved issues of CHT Peace Accord-1997 like land dispute, identity quandary, implementation progress of peace accord, rapid-demographic conversion, withdrawal of SF camps are mostly evolving around EMGs propaganda campaign at the national and international arena using various ways and means. Ill motivated EMGs of CHT are pursuing the youths of CHT, educated sphere of the country and some specific foreign audience.

EMGs' regional political parties are intimately shadowing their armed activities, toll collection, killing, kidnappings etcetera through their mostly fictitious and concocted propaganda activities which have eventual insinuations in the overall conflict resolution of CHT. They are propagating their narratives through electronic and print media, cyber space, social media, conferences, procession, rally, human chain, and other unconventional tools. Few vested IOs and INGOs have also tangled themselves in this devilish game plan. EMGs' propaganda activities have

wide spread circulation both at home and abroad, whereas PsyOps activities of GoB and Bangladesh Army remain mostly reactive while maintaining a submissive stance and inadequate handling by appropriate means.

GoB agencies and officials seem to be oblivious about overall national interests related to CHT affairs. Due to 'Lead Role Syndrome', many GoB officials maintain their bureaucratic stature. GoB also does not maintain adequate key communicators to propagate and broadcast the initiatives taken for the development and security in CHT. No 'Centre of Gravity' has also been identified for executing the ongoing PsyOps effort in CHT. Ostensibly, incoherent PsyOps effort without synergy amongst GoB agencies cannot actually attain the objectives of 'maintaining a stable and prosperous security situation' in the CHT.

After examining the 'elements of national power' applied by two of our regional states; the study has revealed that an 'Integrated Approach' incorporating pertinent 'elements of national power' is an inevitability of time in the overall milieu of PsyOps effort for CHT conflict resolution. However, there are challenges to integrate the 'elements of national power'. Understanding the psychological domain of the EMGs by the GoB agencies and Bangladesh Army may be considered as the most crucial one. 'Perception Management' of GoB officials in pursuance to CHT peace process and conflict resolution seems to be an important facet in the overall gamut. As GoB officials are mostly city based or town centric, this keeps the GoB agencies away from 'winning hearts and minds' of EMGs.

Apparently, CHT has lost its apt responsiveness at the GoB agenda as an 'important one' as it seems that GoB is following the strategy of 'Delay Battle/Silent Strategy' in countering EMGs propaganda. Good governance and rule of law still remained brittle and severely thwarting the socio-economic development of CHT as expected. Allegedly, many media personnel belonging to EMG are pursuing their own controversial agenda in support of EMGs' propaganda campaign. ICT Act-2006 could not yet been enforced in CHT to that extent. Ultimately, an 'Integrated

Inter-Ministerial Approach' to deal with CHT affairs has been considered time worthy in the overall gamut of CHT conflict resolution.

A 'Five Years Integrated Plan for CHT: 2021-2025' through a detailed PsyOps schematic has been suggested in total 7 'Lines of Effort' (depicting 'elements of national power') targeting EMGs of CHT. 'EMGs' Psychology' has been considered as the 'Centre of Gravity' and a total of 60 'Decisive Points/Conditions' in three phases have been perceived in order to achieve the desired 'End State' i.e. 'Stable security situation maintained, CHT developed economically and EMGs' integrated as Bangladeshi citizen'. An 'Integrated Structure' namely 'National Committee for CHT Affairs' (NCCHTA) under 'National Committee for Security Affairs' (NCSA) has also been suggested in order to synchronize and pursue overall PsyOps effort of GoB agencies and bring in the desired 'End State'.

Last but not the least, there are fundamental divergences between GoB and EMG leadership in regards to conflict resolution of CHT alongside addressing the core contentions. Therefore, it can be visualized and anticipated that an absolute solution to the contentions of CHT is not possible in close proximity. However, it may be foreseen that through synergised pursuance by 'NCCHTA' of the PsyOps schematic, PsyOps scenario in future may be in favour of 'Conflict Resolution' to CHT and optimistically, by the end of 2025 it may find the light of 'Conflict Termination' as well. Therefore, GoB agencies together with Bangladesh Army should pursue a coordinated PsyOps plan while intergating 'elements of national power' in 'conflict resolution' for a 'developed CHT' in the days to come.

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STUDY ON COUNTERING MARITIME HYBRID THREAT AT SEA: A COMPREHENSIVE APPROACH BY BANGLADESH NAVY

Commander A K M Ikramul Hossain, (G), afwc, psc, BN

Introduction

The 'Hybrid War or Warfare' describes the 'blending and blurring character' of contemporary conflicts. According to Frank Hoffman, it is "a full range of different modes of warfare including conventional capabilities, irregular tactics and formations, terrorist acts including indiscriminate violence and coercion, and criminal disorder" (Hoffman, 2007, p. 8). Oscillating through the multiple levels of war, a hybrid actor seeks to achieve a synergistic effect both in 'physical' and 'cognitive' dimensions of a conflict. The political, economic, informational, cyber, humanitarian and other non-military means are used in synchronisation to circumvent or undermine the adversary's conventional military means in achieving the desired strategic effect (Cullen and Kjennerud, 2016, p. 3). However, as of now, there is no single and unanimously agreed-to meaning of 'Hybrid Warfare' to comprehend its entirety.

The maritime domain being highly porous and discordant to enforce the rules of the land allows the hybrid threats to suitably manifest. Over the years, maritime terrorism with increased hybrid character bewildered the lines between conventional and sub-conventional levels of conflict. Mumbai attack in November 2008 stands as a terrifying example (Khurana, 2017, p. 2) in this context. Besides, the Naval Forces of Ukraine in Crimea were first to counter hybrid aggression from State actors in 2014. Thus, 'Maritime Hybrid War' (MHW) is now a distinct possibility that discourages the navies to insistently focus on their traditional roles only ignoring the probability of asymmetric or irregular tactics employed by an indistinct actor (Kulshrestha, 2017).

Geographically sited between the courtiers with conflicting interests coupled with ‘multipartite interest’ in the Bay of Bengal (BoB), Bangladesh might get entangled in a conflicting situation, presumably braided with hybrid approaches. Waging a hybrid war in the maritime context is predominantly aggressive and proscribed to exhaust the adversary (Khurana, 2017). However, the Defence Policy of Bangladesh-2018 dictates Bangladesh Armed Forces (BDAF) to “establish a firm defensive posture convertible to the offensive” based on the situation. From such apprehensions, it can be implied that Bangladesh Navy (BN) may have to restrain from aggressive exploitation of the multi-dimensional proposition of hybrid war; instead, prepare for a robust response to counter MHW threats.

As the features of MHW are considerably outside the domain of conventional naval warfare, countering it would necessitate a comprehensive approach with the active involvement of other elements of national power. BN at present lacks in readily available doctrine or concept of an integrated response. Thus, the broad objective of this research is to propose a probable ‘Framework of Comprehensive Approach’ to counter likely MHW threats in the maritime front of Bangladesh. It is a novel endeavour in studying MHW in Bangladesh caveat and proposing a framework of comprehensive approach to counter likely MHW threats in the maritime front of Bangladesh, where BN could play a pivotal role in assimilating and directing coordinated response by the relevant stakeholders.

Review of Literature

General Attributes of Hybrid Warfare

Hybrid war is both strategic and tactic; a form of war as well as warfare as argued by both Hoffman (2007) and Lasica (2009). Frank Hoffman described hybrid warfare as a full range of different modes of war meant to attack one’s weaknesses at all levels with complex threats, in multiple domains to create strategic effects through tactical success (Hoffman, 2007, p. 8). Lasica (2009), stated that the significant enabler of hybrid warfare is its prominence over adversary’s ‘cognitive and moral domains’,

that targets its population and will power to draw into a hybrid war while denying its quest for a decisive military victory. Bingöl (2016), was found with a similar opinion while he farther added that the physical domain of such war remains mostly unidentified and symbolic.

Types of Hybrid Warfare

Kjennerud and Cullen (2016), find that based on participating actors, hybrid warfare can be of two types, i.e., ‘Non-state Hybrid Warfare’ and ‘State Hybrid Warfare’. Non-state Hybrid Warfare is characterised by the expansion of its battlefield beyond the military realm including the growing use of non-military tools like terrorism, organised crime, online propaganda, cyber warfare and ideological mobilisation to achieve asymmetric advantages over a state actor. To the contrary, the State Hybrid Warfare involves full integration of military and non-military means of a state power to achieve political goals. They strongly argued that only a state with highly centralised abilities to coordinate and synchronise their instruments of power would be able to create such a synergistic effort.

Conceptual Distinctions with Other Forms of War

Hybrid war is often amalgamated with Fourth Generation War (4GW), Compound War and a Chinese school of thought on Unrestricted War. Hybrid war is much broader in concept, which has elements of 4GW in it and focuses on external threats (Bingöl, 2016, p. 6). To the contrary, “a non-state 4GW actor employs a wide range of conventional and unconventional means, including terrorism and information, to undermine the will of the existing state, to de-legitimise it, and to stimulate an internal social breakdown (Islam, 2015)”. Likewise, the compound wars are those major wars that have significant regular and irregular components, fighting simultaneously under unified command/ strategic direction. In contrast, in a hybrid war, regular and irregular capabilities are fused into a single force (Islam, 2015). Islam (2015) stated that the Chinese concept of Unrestricted Warfare or “war beyond limits”, is also popularly recognised as a hybrid war waged by a state actor. It is characterised by omnidirectionality, synchrony

and asymmetry to employ and command a combined organisation involving various domains of national power (politics, economics, military, diplomacy and religion).

Maritime Hybrid Warfare

The maritime domain is exposed to the much easier manifestation of hybrid war due to its vital economic importance, porosity and other amiable attributes. Khurana (2017), in a journal article, presented some hybrid concept which can replace the traditional naval warfare tactics, giving an adversary the leverage of denying any link with such acts. For instance, employing terrorist group to disrupt Sea Lines of Communication (SLOC) or mining choke points would have a similar effect of Blockade. An actor can further augment the effect by paralysing sea-trade, port management system through using cyber-attack as well as exploiting social media. Alternatively, Kulshrestha (2017), stated that hybrid warfare in naval context is “a violent conflict utilising a complex and adaptive organisation of regular and irregular forces, means, and behaviour across a predominantly maritime domain, which seeks to exhaust a superior military force”. Both of them agreed that countering it would demand a robust Maritime Domain Awareness (MDA) structure and integration of various agencies to belittle the intelligence gaps.

Hybrid Warfare vs Lawfare

The inherent complexity and character of hybrid warfare not only creates ambiguity but also attribute to legal challenges for the opponents. Bingöl (2016), identified that Russia has long been exploiting various fields of hybrid war such as supporting insurgency and cyber-attack against Estonia; sending conventional soldiers in Afghan Army uniform to seize government building in Kabul; using regular and irregular forces backed by economic sanctions, energy blockade, political destabilisation, information operations and cyber-attacks against Ukraine. Bachmann and Mosquera (2017) recognised these events as an act of ‘Lawfare’ by Russia, where the law is being evaded, manipulated, resulting in a dreadful change in the

legal paradigm of warfare. On account of this, Bingöl (2016), opined that a complete denial of international humanitarian and human rights laws is imminent in the coming days.

Methodology

Research Type and Approach

The research is an ‘Exploratory’ and cross-sectional study that followed a ‘Mixed Method Approach’ featuring both ‘Theory and Data Triangulation’. The research encompasses the analysis of both qualitative and quantitative data.

Data Collection Methods and Tools

Primary data have been collected through perception surveys, interviews and focus group discussion (FGD). The population for survey belonged to BDAF (completed/undergoing Staff Course/ AFWC), BCG and other experienced respondents from different maritime sectors selected based on Nonprobability Purposive Sampling. The secondary data were collected from previous researches on the subject and internal documents at National Defence College and Defence Services Command and Staff College. Besides, various books, journals, periodicals, newspaper articles and information available in online open sources were used.

Data Analysis

For all structured closed-ended questions, a range of possible answers was provided. For qualitative data, a ‘framework analysis’ have been followed, whereas, for quantitative data, a ‘descriptive’ approach of statistical calculation was followed.

Results and Discussion

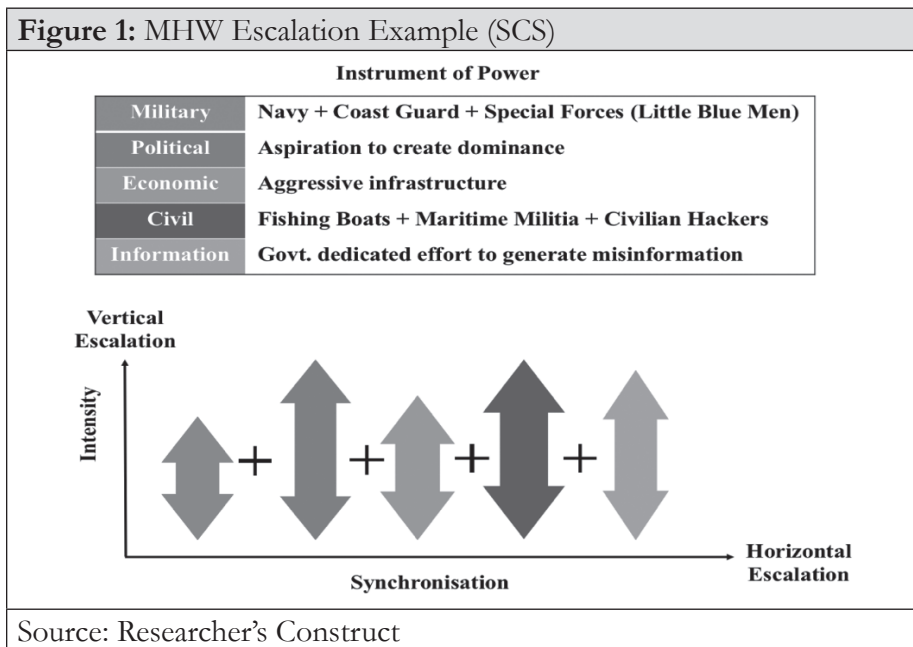
Conceptualisation of Maritime Hybrid War

For the maritime domain, the potentials of hybrid warfare have not yet been fully discovered and adequately studied as intensively as for land domain. Thus, a conceptual development on MHW has been endeavoured

base on studies of hybrid warfare in general and case studies on Chinese way on MHW in the South China Sea (SCS), MHW element of Russian hybrid warfare in Crimea, Mumbai Attack on 2008 and MHW threat expected from Iran by the western countries.

Key Features of MHW

MHW can be ‘Non-state’ as well as ‘State’ centric, predominantly asymmetric, multimodal or multi-variant form of war. A hybrid actor would make synchronised use of military, political, economic, civilian and informational (MPECI) instruments of power tailored along the horizontal and vertical axis in varying degrees to exploit specific vulnerabilities across the political, military, economic, social, informational and infrastructure (PMESII) spectrum of adversaries’ maritime domain (Cullen and Kjennerud, 2017, pp. 7–8). For example, China in SCS synchronised her MPECI instruments of power horizontally with an option to increase their intensity vertically (Figure 1 below) in pursuit of its strategic objective, i.e., to establish its unchallenged dominance over the area.



Operatives, Ways and Means

An attack from MHW actor may be disruptive, non- distinguishable and may not fit into traditional attack-phase thinking. It may primarily aim to (1) deter opponents' capability, (2) cause economic harm, (3) create instability (4) harm the civilians/mass casualty, (5) cause environmental damage (Ilter, 2016). Russian Crimea Campaign and Chinese aggression in SCS gave an insight that an MHW actor would avoid direct involvement of naval forces and make use of lawfare to circumvent the Laws of Armed Conflict (LOAC) and likely international criticisms. Thus, civilian vessels/ crafts augmented with a variety of weapons and sensors may be generally used in MHW. The operatives could be individuals from military forces, civilians, members of terrorist groups or proxies (often termed as “little blue men”) who usually refuse to be part of any organised military or statecraft.

Likely MHW Threats in Maritime Front of Bangladesh

Geographically, Bangladesh is located between two neighbours with conflicting interests and several bilateral discords, where China is just 100 kilometres away greatly influencing the regional geopolitics (Kabir, Islam and Akter, 2018, p. 002). Besides, the Indian Ocean Region (IOR) is considered as the stage for next superpowers' ‘Great Game’ with massive ‘geopolitical tectonic-plate movement’. So, Bangladesh will always be part of certain hybrid tussles due to its location (Rahman, 2020). As a result, the maritime domain of Bangladesh with its growing economic potentials vis-à-vis vulnerabilities would remain susceptible to both traditional and non-traditional threats with hybrid character. Table 1 summarises the ‘Likely MHW Threats’ for Bangladesh identified based on detailed environmental scan and FGD.

Table 1: MHW Threat Matrix in Maritime Front of Bangladesh			
Ser	Actor's Likely Intend	Likely MHW Threats	Overlapping Impact/Harm
1.	Deter Own Capability	Harassment/ attack on naval/ coast guard vessels	Mass Casualty
2.		Blockading harbour mouth by unconventional means	Trade Disruption
3.		Cyber-attack on vessels navigational and communication system	Economic Harm
4.	Economic Harm	Illegal Exploitation of maritime resources	Deter own capability, Environmental Damage
5.		Sabotage on subsea, offshore and coastal infrastructures	Creating Instability
6.	Trade Disruption	Harassment/ attack on merchant ships	Economic Harm
7.		Disruption of SLOC by unconventional means	Economic Harm
8.		Cyber-attack on Port Management System	Economic Harm
9.	Mass Casualty	Attack on fishing fleet and fishermen	Creating Instability, Economic Harm
10.		Attack on coastal passenger ships	Creating Instability
11.	Environmental Damage	Marine pollution	Economic Harm, Deter Own Capability
12.	Creating Instability	Propaganda or IW in sync with other MHW threats	Economic Harm Deter Own Capability

Source: Researcher Conceived

Conceptualising A Probable MHW Countering Model

“Hybrid warfare describes the problem, not a solution” (Cullen and Kjennerud, 2017). However, the Multinational Capability Development Campaign (MCDC) projects on Countering Hybrid Warfare (CHW) by NATO and the proceedings on international Sea Power & Security Symposium - 2016 of Turkish Naval War College gave some insight on countering threats with hybrid character, where the perception survey and expert opinion substantiated the “End’, ‘Ways’ and ‘Means’.

Determining ‘Ends’ or Strategic Goals

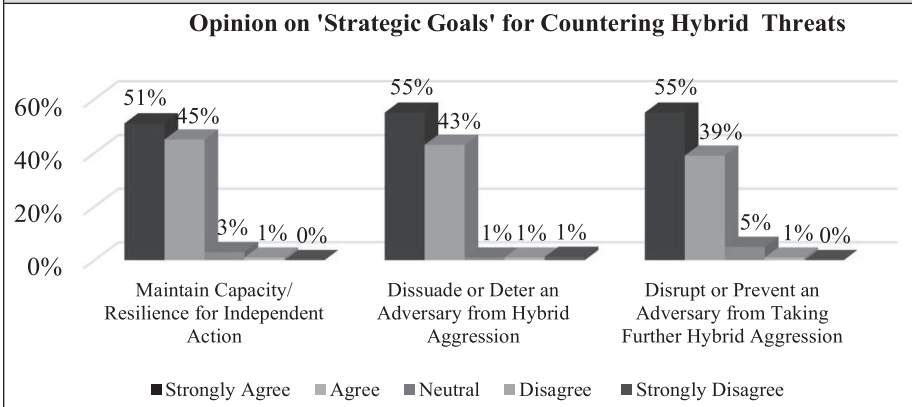
Monaghan, Cullen and Wegge, (2019) stated that once a hybrid threat is recognised, a definite and unambiguous ‘ends’ need to be set to determine possible counteractions. Following three strategic goals were found generic for designing standard hybrid warfare countering model:

Strategic Goal 1 (SG-1): Maintain Capacity for Independent Action. SG-1 suggests a joint and coordinated approach to ‘build resilience’ against hybrid threats, which requires a detailed assessment of vulnerabilities while maintaining the capacity and capability of independent operations. Most resource personnel opined that “SG-1 could probably be an undeniable option and pre-condition for any subsequent goals for BN and other stakeholders.”

Strategic Goal 2 (SG-2): Dissuade or Deter an Adversary from Hybrid Aggression. SG-2 goes beyond the resilience and requires introducing deterrent effects through ‘deterrence-by-denial’ and impose costs upon adversary by ‘deterrence-by-punishment’.

Strategic Goal 3 (SG-3): Disrupt or Prevent an Adversary from Taking Further Hybrid Aggression. SG-3 encompasses the measures to disrupt and degrade an adversary’s capacity or will to carry out hybrid aggression. Most resource personnel agreed that “achievement of SG-3 in the maritime context would necessitates the whole-of-government approach to overcome any shortfall in military power”.

Figure 2: Opinion on Strategic Goals or Ends for Countering MHW Threat



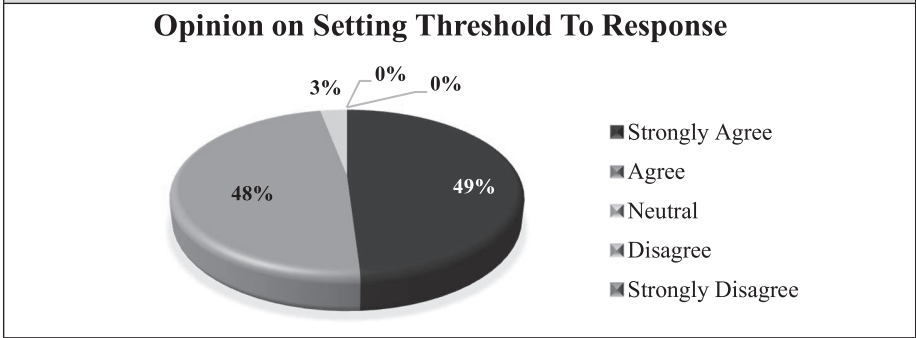
Source: Survey Data Analysis

Based on survey response in Figure 2 (mean value of SG-1=4.46, SG-2=4.50 and SG-3= 4.48, are close to ‘Strongly Agree’) and expert opinion, all three strategies stated above were considered relevant ‘Ends’ for MHW countering model.

Threshold to Respond

Which ‘end’ to be persuaded depends on the “intensity of an attack and level of hostility that can be reasonably tolerated” (Cullen and Kjennerud, 2017, p. 20). Many of the interviewees opined that it would not be appropriate to respond to every individual incident and a threshold to response need to be set depending on the frequency of attacks, their criticalities and vulnerabilities across PMESII domains. Figure 3 also shows a higher degree of agreement by the respondents (Mean=4.46, close to ‘Strongly Agree’) for its incorporation in the MHW Countering Model.

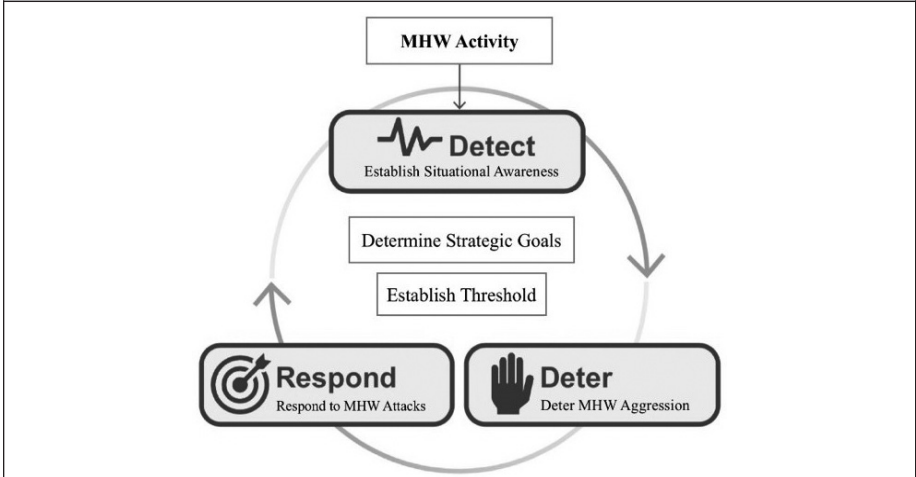
Figure 3: Opinion on Setting Threshold to Response for Countering MHW Threat



Source: Survey Data Analysis

Determining ‘Ways’ and ‘Means’. The ‘ways’ and ‘means’ to achieve stated ‘ends’ are represented by three essential components, i.e. Detect, Deter and Respond which need to be directed by a clear term doctrine (Monaghan, Cullen and Wegge, 2019, p. 22). Figure 4 describes the linear connection of these components to achieve an ‘end’ based on a predetermined threshold, where the situational awareness insinuates the ways and means of deterring and responding to an MHW aggressor.

Figure 4: Components of Countering MHW Threat



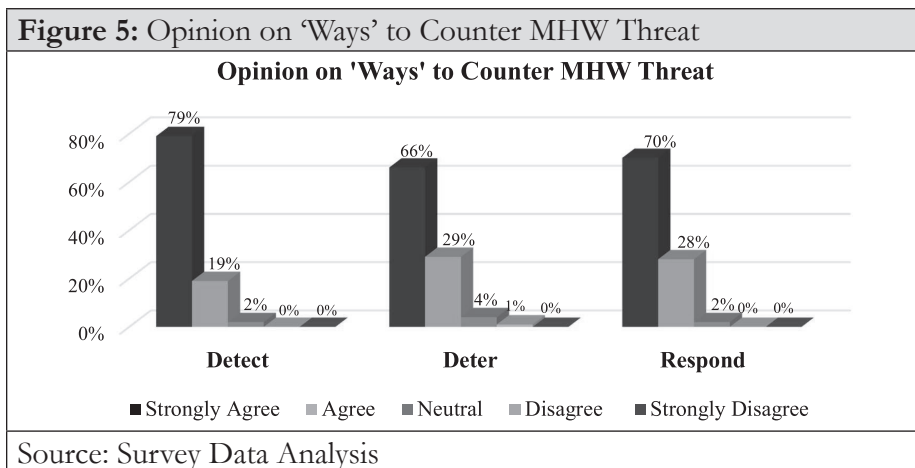
Source: Monaghan, Cullen and Wegge (2019), modified by Researcher

Detect. The purpose of ‘detect’ is to establish situational awareness through gathering ‘warning intelligence’. It incorporates ‘monitoring’ and ‘discovery’ of threat through a substantial and coordinated information-sharing mechanism (Monaghan, Cullen and Wegge, 2019, pp. 25-26).

Deter. Deterrence is the ability to dissuade hybrid actors from resorting to any armed aggression. As opined by most resource personnel, the naval strength remains vital to the credibility of traditional deterrence in the form of Deterrence by Denial and Deterrence by Punishment, which can be augmented by a whole-of-government approach.

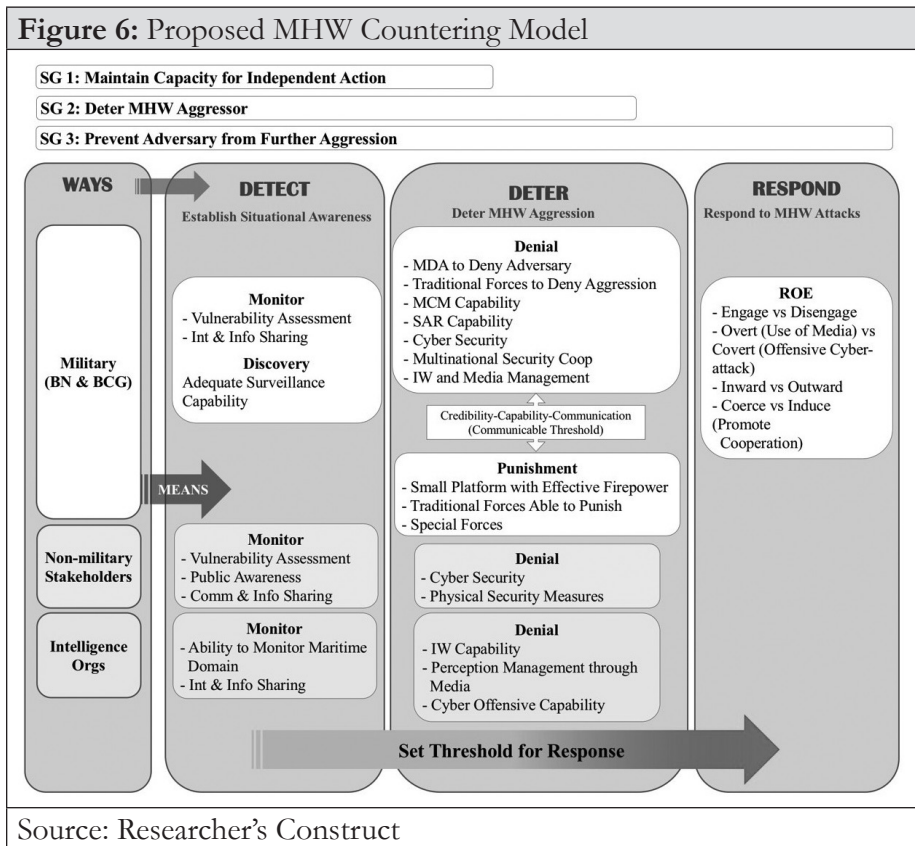
Respond. It focuses on taking punitive measures should the deterrence fails. Significantly, most interviewees opted for an adaptive ROE and a whole-of-government approach to decide the appropriate response against an MHW aggressor.

Based on a higher degree of survey response in Figure 5 (mean value of Detect=4.77, Deter=4.60 and Respond= 4.68, are close to ‘Strongly Agree’) and expert opinion, all of them have been considered as the ‘Ways’ for MHW countering model.



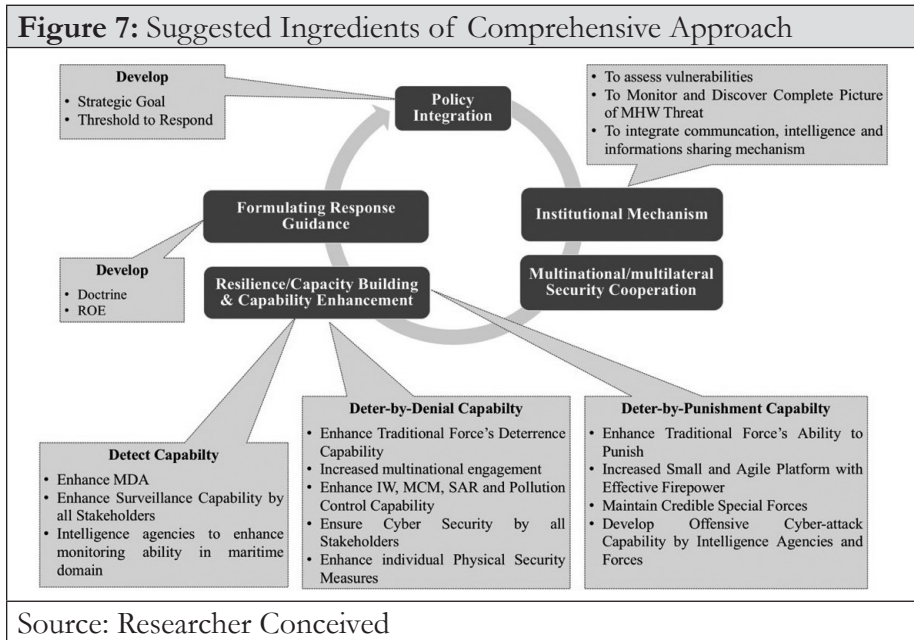
Proposed ‘MHW Countering Model’

An MHW countering model has been proposed as the fundamental guide to counter likely MHW threats in Bangladesh. In doing so, the essential capabilities/counteractions against identified MHW threats have been superimposed to the hybrid countering components through a comparative table. Figure 6 explains the proposed MHW Countering Model, where three Strategies are set with the extent of their threshold of response. Countering components, i.e., detect, deter and response being the ways for achieving the ends the essential capabilities/counteractions for all related stakeholders have been aligned as the means.



Stakeholders’ Capability Gaps vis-à-vis Ingredients of Comprehensive Approach

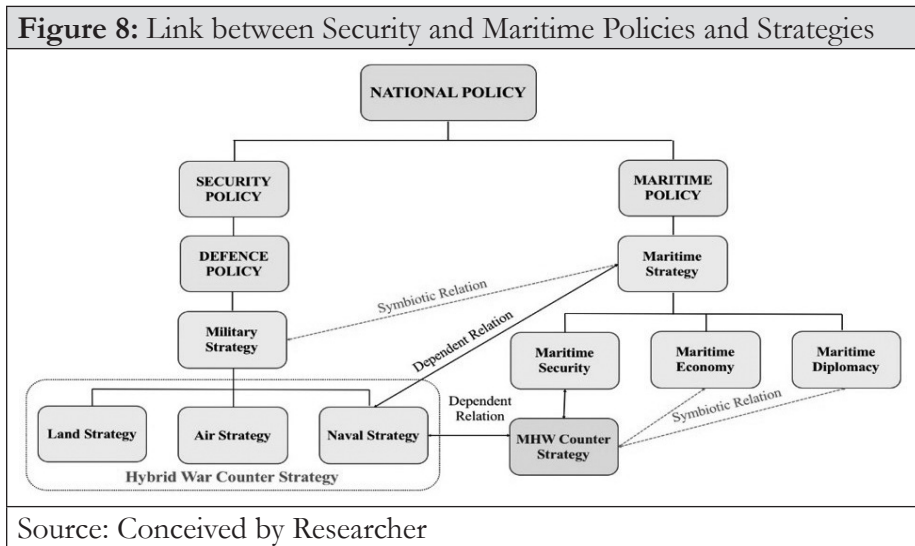
The research endeavoured to identify the capability gaps of stakeholders primarily focusing on the capabilities of ‘Maritime Security Providers’, ‘Maritime Trade and Economic System’ and ‘Intelligence Agencies’. Consolidating the gaps in essential capabilities, Figure 7 below depicts five suggested ingredients, i.e., policy integration, institutional mechanism, resilience-building, response guidance and multinational/multilateral security collaboration for a comprehensive approach to MHW threats with proposed sub-actions.



Approach-1: Policy Integration-Linking Relevant Policies and Strategies to Identify Strategic Goals

As the foremost approach, the fundamental necessity is to link relevant policies and strategies for countering MHW threats. Figure 8 explains that ‘naval strategy’ within broader ‘military strategy’ and ‘maritime security strategy’ should coexist to counter MHW threats militarily. However, due

to the overarching nature and impact of MHW threats, the other two components of maritime strategy, i.e., economy and diplomacy would maintain a symbiotic relationship with an MHW counterstrategy. Most interviewees opined that National Committee on Security Affairs (NCSA) might devise policies for outlining suitable ‘Ends’ to counter likely hybrid threats by AFD.



Approach 2: Institutionalising Mechanism (Whole-of-Government Approach) for Complete Threat Assessment and Synchronised Response

An institutional mechanism with authority to gather, assess and analyse the wide-spectrum data from several stakeholders can produce a ‘comprehensive fused picture’ of threats. Besides, a collocated decision-making body with authority can ensure implementing required countermeasures, retaining the threshold to respond (Monaghan, Cullen and Wegge, 2019, p. 65). Some interviewees opined that the proposed MHW countering model would only be useful if efforts of relevant instruments of power are coordinated and synchronised.

Approach 3: Build Resilience/Capacity Building and Capability Enhancement to Detect and Deter

The resilience-building is necessary to create deterrence achieved through self-analyses of vulnerabilities and adversaries intent to exploit them. list of sub-actions for capacity building/capability enhancement by all stakeholders has been projected in Figure 7; however, their balanced implementation depends on individual organisations/agencies. Nevertheless, the impetus can be brought by instituting joint agreement on critical issues like communication and information sharing mechanism etc. through regular ‘Dialogues’.

Approach 4: Enhancing Multinational/Multilateral Security Cooperation

Maritime forces need to find new avenues of collaboration besides their current effort of bilateral/multilateral security cooperation, which would possibly change the mindset of apparent adversaries. Besides, some interviewees opined for active engagement with supranational bodies such as IONS, BIMSTEC, IORA to deter any MHW actor.

Approach 5: Formulation of Doctrine and Adaptive ROE

An adaptive doctrine on MHW being an authoritative body of statements would reduce the existing knowledge gap. Most resource personnel suggested that the ‘MHW Doctrine’ should provide a specific threat knowledge with standardised measures to detect, deter and respond. ROE needs to be created as a guideline for a military response, defining circumstances, conditions for the use of force.

Relevance and Ranking of Ingredients for Comprehensive Approach

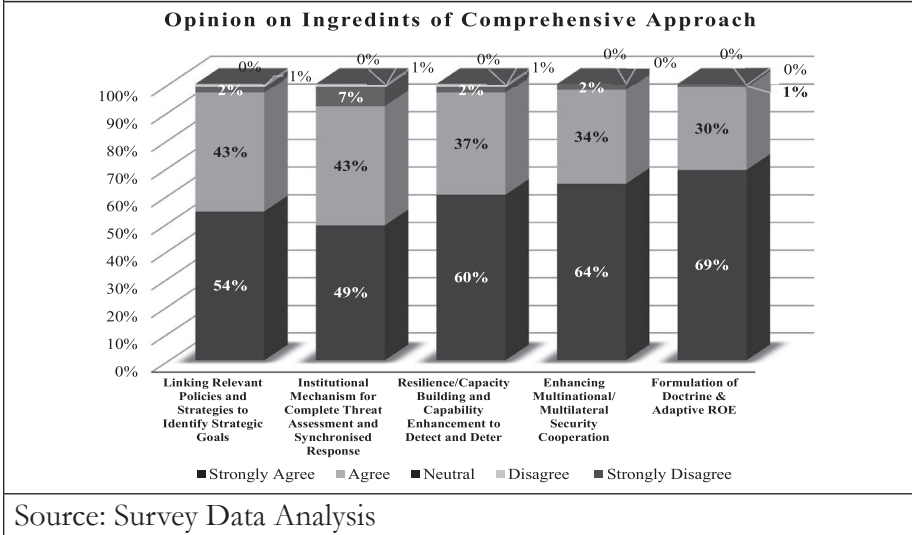
The respondents’ degree of agreements (Table 2 and Figure 9) indicate that all the ingredients are relevant to the Framework of Comprehensive

Approach where ‘Formulation of Doctrine and Adaptive ROE’ was found as the most significant ingredient of the comprehensive approach (Mean=4.68, SD=.490). As all the ingredients showed high relevance to Bangladesh, there is a relation between Countering Maritime Hybrid Threat at Sea and Comprehensive Approach by Bangladesh Navy.

Table 2: Relevance and Ranking of Ingredients for Comprehensive Approach				
Ranking	Ingredients	Descriptive Statistics (Survey Response)		
		Median	Mean	Std Deviation
Priority 1	Formulation of Doctrine and Adaptive ROE	3	4.68	.490
Priority 2	Enhancing Multinational/ Multilateral Security Cooperation		4.62	.528
Priority 3	Build Resilience-Capacity Building and Capability Enhancement to Detect and Deter		4.56	.592
Priority 4	Linking Relevant Policies and Strategies to Identify Strategic Goals.		4.50	.595
Priority 5	Institutional Mechanism for Complete Threat Assessment and Synchronised Response		4.40	.667

Source: Developed by Researcher

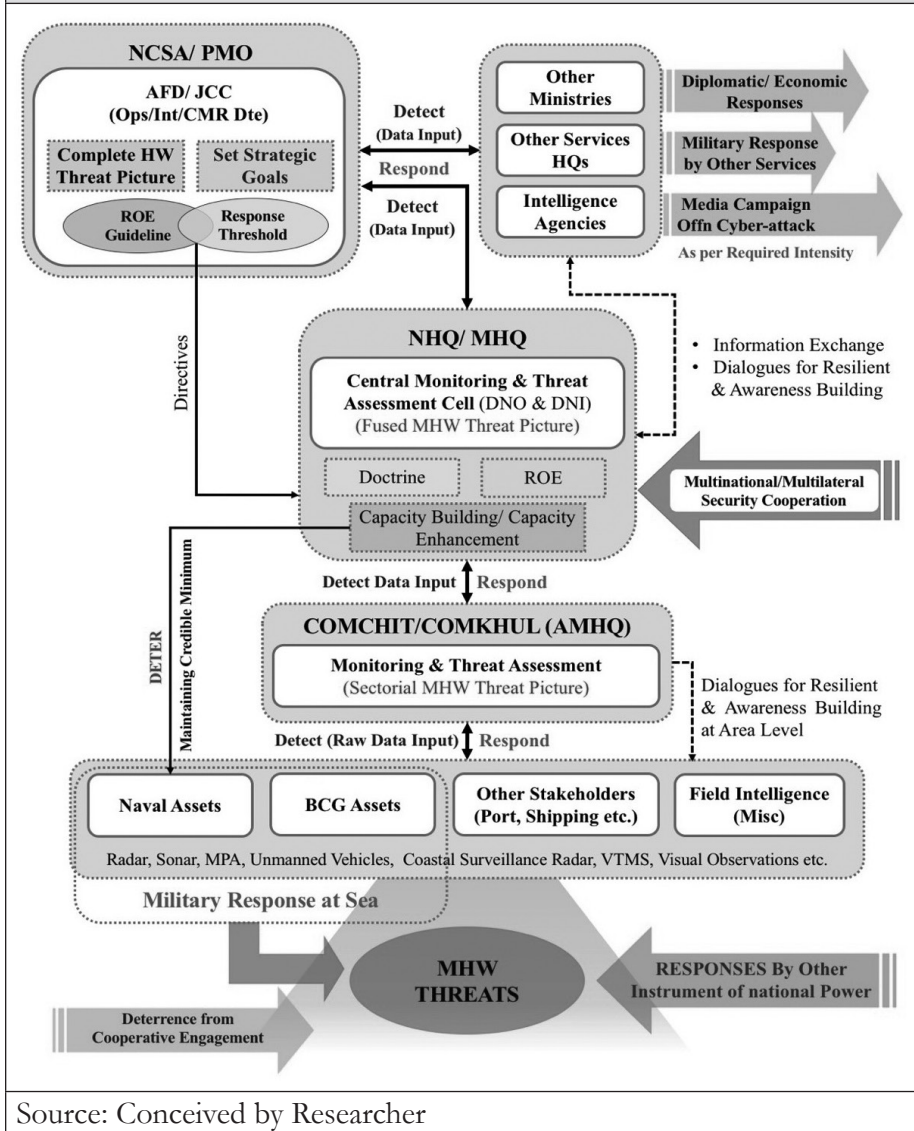
Figure 9: Relevance of Ingredients for Comprehensive Approach



Proposed Framework of Comprehensive Approach

Figure 10 depicts the schematic of the ‘Framework of Comprehensive Approach’ to counter likely MHW threats in the maritime front of Bangladesh. It proposes a whole-of-government approach connecting all relevant instrument of national power at all three levels to detect, deter and respond to any MHW threat. Detect data generated at tactical level reaches to strategic/military-strategic level to seek appropriate direction for countermeasure. Besides, the operational and tactical level would remain equipped with appropriate Doctrine, ROE to act independently as per set Strategic Goals and Threshold to Respond. The deterrence effect can be augmented by multinational/multilateral security cooperation.

Figure 10: Framework of Comprehensive Approach to Counter MHW Threat



Source: Conceived by Researcher

A 'Monitoring and Threat Assessment Cell' may easily be activated under Commander Chattogram Naval Area (COMCHIT) and Commander Khulna Naval Area (COMKHUL), who generally coordinate, liaise and communicate with other naval commands, BCG, port authorities and

other maritime agencies for the smooth conduct of naval operations. As the same commands will be transformed into Area Maritime Headquarters (AMHQs) during any conflict and take control over shipping and other maritime activities, all desired 'detect data' from related stakeholders may be fed to the proposed cells and be forwarded to Naval Headquarters (NHQ) or the Maritime Headquarters (MHQ). NHQ may activate a 'Central Monitoring and Threat Assessment Cell' to gather, assess and analyse the data and generate a 'comprehensive fused picture of MHW threats' and forward the same to AFD, which would be transformed into Joint Command Centre (JCC) during a conflict. AFD/JCC is also expected to acquire a complete threat picture which would be projected in front of the strategic and military-strategic leaderships. Based on a pre-set 'Threshold to Respond' a coordinated countermeasure can be decided upon and passed across the military, diplomatic, economic, social and informational instruments of national power.

Recommendations

The recommended framework of 'Comprehensive Approach' comprehends the proposed MHW countering model within an existing institutional mechanism that can be made functional both during peace and wartime. It was endeavoured to address the shortfalls of stakeholders within approach ingredients, logically blend at various levels to counter MHW threats synergistically. This research intended to study and propose a framework of countering MHW threats as a conceptual and intellectual baseline for the government and military decision-makers to design and implement policies in actual time. The research finally ascertained that a 'Comprehensive Approach' could address the MHW threat more coherently and effectively. The research has the following recommendations:

- BN may adopt the proposed mechanism to process the 'complete maritime threat picture' to respond and coordinate appropriately with minor modification of existing setup.

- AFD may set reasonable strategic goals with appropriate thresholds for developing the doctrinal concept and building resilience/capability by BDAF.
- A mechanism to conceive a ‘complete hybrid threat picture’ across the full spectrum of PMESII may be developed in AFD to coordinate responses when needed.

Conclusion

Bangladesh is highly vulnerable to MHW threats due to its exposure to porous maritime environment and the inherent hybrid geopolitical situation. However, the research identifies that the idea of hybrid warfare in the maritime domain is much blurred, and least studied. Through contemporary studies, it was comprehended that a hybrid actor is likely to exploit the vulnerabilities across the full spectrum of PMESII in the maritime domain of Bangladesh in pursuit of its strategic objective. The adversary would escalate a power vertically to intensify its impact yet incorporate other instruments horizontally to make synergistic effort to maximise the total shock. Therefore, it was well perceived that countering MHW threats may not confine within the maritime domain only and needs a whole-of-government approach. In that context, the research endeavoured to create a model of countering MHW to realise the appropriate ends, ways and means.

The proposed model suggests for setting-up Strategic Goals as ‘ends’ which would aid to build resilience and pursue counteractions. The ways (detect, deter and respond) and means for different stakeholders were categorised to understand the capabilities of individuals, including existing gaps. So that, the capability gaps can suggest the ingredients of the Comprehensive Approach to counter the MHW threats.

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CHALLENGES AND PROSPECTS OF SMALL AIR FORCE IN THE 21ST CENTURY: BANGLADESH AIR FORCE PERSPECTIVE

Group Captain Md Muktasim Billah, afwc, psc, GD (P)

Introduction

As Heraclitus said, “The only constant in life is change”; sometimes it is a necessity and a demand of the time to remain up-to-date with that change. For an Air Force, it is both - to update its capability to remain as a relevant and a credible military force. Throughout the last century, uncountable changes/developments had taken place all over the world. Air Forces being technology-based are facing difficulties to cope with the same pace. Air Forces are also facing other newly emerging security threats and challenges emanating from geopolitical, geo-economic, social and environmental changes. Thus, the new security environment in the 21st century has ushered in a compelling paradigm shift globally in security concept and defence. However, these changes have also brought opportunities and prospects which are more significant for the very effectiveness of the Small Air Force (SAF) in particular due to the inherent limitation of their capability and budget. Bangladesh Air Force (BAF) is no exception. Therefore, to remain effective in facing the new challenges of the 21st century, it is the cry of the time for such air forces to deliberately engage in serious soul-searching research to identify the vulnerabilities of their present status and quickly adopt necessary actions.

Science & technological advancement, geopolitical situations, social and security environmental changes are all dynamic in nature as well as interrelated to each other. Technologies have become enormous in varieties as well as expensive in nature. Technological innovations are much prominent and transitory in the military domain that demand relatively quick

replacement of older versions of equipment and armaments to keep the pace and compatibility with that of adversaries. Again, these technologies are often short-lived and become obsolete or irrelevant within a few years. For being technology-based, an Air Force faces these challenges more often than other Forces. The SAFs suffer budgetary crises resulting in a lack of credibility related to enhancing their operational capabilities. On the other hand, with these new technological challenges, there are also unconventional innovations of technologies like Unmanned Air Vehicle/ Combat Air Vehicle (UAV/UCAV), Artificial Intelligence (AI), Cyber Warfare (CW) etc., which are generating hope. Instead of single-purpose aircraft, there are more numbers of 'Multirole' capable aircraft opening more options for Air Forces.

The geopolitical situation, strategic relations and budgetary constraints of small countries put extra pressure on their armed forces to be professionally more ready and operationally more equipped but with more economical viabilities. Moreover, the war has new incorporation like Hybrid Warfare, 4th Generation Warfare (4GW), Unconventional warfare and so on, involving state as well as non-state actors taking part from outside as well as inside the states. Besides, many newly emerging security threats are transnational, e.g. terrorism, natural disaster, cyber threats etc. requiring new strategy to handle them with increasing more regional or international security cooperation. Human lives and rights have become more critical and sensitive issues than before. International organizations such as International Human Rights Commission, International Humanitarian Law etc. are enforcing legal embargoes and rules to protect human lives and properties. Minimum collateral damage is given due regard and priority before engaging in any conflict. Due to these concerns, the Air Force has evolved new weapons and employment strategies to meet the demand of the political leadership by introducing precision weapon, smart bombs, surgical-striking power to enable states to conduct small yet lethal operations. Thus, along with the progress of the 21st century and new threats, Air Force has become more and more 'first choice' of political masters. On the other hand, for small developing states, socio-

economic development is a more crucial agenda than military. As a result, just a minor piece of the budgetary pie is usually spent behind the military. Thus, military particularly Air Force, needs to redesign its force structure and roles, not only to embrace traditional military threats and challenges, but also non-traditional national security threats. The involvement of Air Forces in Military Operations Other than War (MOOTW) is also increasing and diversifying.

Review of Literature

At the ‘International Conference on Air and Space Power’, held in Istanbul Turkey on 28-29 March 2013, on ‘The Role of Airpower in 21st Century Operations’, Lt. General (Retired) David Deptula, (2013) emphasized achieving a future force structure much differently in the 21st century (information age) than what was done in the 20th century (industrial age) of warfare. He emphasized on jointness of services to produce synergistic result. He said that Network-centric, interdependent, and functionally integrated operations are the keys to future military success. But the challenges faced by SAFs were not addressed.

Hanjie (2014) in his article ‘Airpower and Small States’ contends that airpower offers strategic value to geo-strategically vulnerable small states. The inherent characteristics of airpower as well as its recent technological transformation allow such small states to employ airpower strategically to achieve quick and decisive victories. Such a capability is enhanced by the ability of small states to take a long-term view of their force structuring requirements and rapid force to modernization. A small state may have limited abilities in building a large air force. He says that by recognizing the advantages of airpower and constructing a well-balanced air force that is versatile and effective in a range of operations, through peace to war, the state shall be able to harness the full potential of airpower as an instrument of national policy to achieve strategic outcomes in overcoming its vulnerabilities and defending its sovereignty.

Group Captain Zahir (2019) in 'Air Options for a Small Air Force' identified challenges like, not having the right strategy for airpower, the degraded operational environment, inappropriate targeting philosophy, and joint campaign with hazy Command & Control system. He suggested that those challenges could be mitigated by a spelt out national Security Strategy, Collaboration and Cooperation at all levels, and finally having a robust training to prepare all personnel in a SAF. He also referred to the definition of SAF as having less sustenance capabilities and not able to conduct some elements or part of the airpower spectrum.

Prof. Kainikara (2019) in his 'Small Air Forces at The Critical Juncture' examined the current status of SAFs and evaluated their contribution to national security. He stipulated the factors and capabilities to classify air forces as large, medium or small. Four key elements, like size, capabilities, national technology base and doctrine, were discussed to determine the status of the Air Forces. He mentioned that challenges to SAFs could materialize from many factors, the security environment, geostrategic issues that impact the employment of air forces. Again, the five issues that influence the security environment are: economic globalization, alliances, international power balance, future wars, and technology. According to him, six primary factors have the maximum influence on the capability, status and success of a SAF doctrine; its development, professional master, training, personnel management, logistics and the quality of air power it is capable of producing. A SAF could be successful by carefully crafting these factors to support each other mutually and blending them to form a holistic, single entity, the indication of which will be its ability to create strategic effects in the national security arena.

Park Song-Kuk (2000) in his 'The Challenge for the ROK Air Force in the 21st Century' envisaged the challenges for South Korea Air Force in the 21st century. He identified that the main challenge for the ROK Air Force is to build an efficient and smart air force to ensure the core competencies of air and space power, that is, information superiority, air and space superiority, precision engagement, and agile combat support. He mostly

emphasized on attaining Space Power and Air Superiority Fighter by the ROK. He did not discuss other challenges of a SAF.

Air Chief Marshal Fali Major (2008) in his speech on 'Indian Air Force in the 21st Century: Challenges and Opportunities', emphasized that national institutions like armed forces must reflect and adapt to current realities, contemporary systems and technologies. According to him, India is faced with full 'spectrum of threats' from nuclear confrontation, through conventional war; to conflicts limited in area, scope or objectives; to all kinds of non-traditional threats. He suggested for the necessity of moving from 'threat-based approach' to 'capability-based approach' which would help lessen the uncertainty and unpredictability. He suggested IAF's modernization plan, aiming to sustenance and enhancement of operational potential and consolidating the specified force levels through judicious, cost-effective replacements and up-gradation of existing resources. IAF has already progressed a long way according to his guideline.

Methodology

A mixed method convergent parallel approach is used to achieve the best goal and objectives set for the research. The primary data are collected through survey method and interviews. Sampling is done randomly, but carefully takes the appropriate cross-section of the target group. Secondary sources are content analysis from publications, periodicals and open sources on the internet.

Small State and Small Air Force

Small State

The word 'Small' is a relative term that encompasses both qualitative and quantitative properties. The size of the population was an important criterion to define 'Small State'. But the size of the population cannot be the strong separator. Many states have small territory with limited natural resources but have massive human resources. Bangladesh is an

ideal example of this category. Rabby (2015) defines ‘Small State’ as a nation-state that has a nominal territory with a population of any size, a hardly effective or meagre military power, limited natural resources, and emerging or struggling economy. Bangladesh having an overwhelmingly large population with minimal territory qualify itself to become a small state. It’s maintaining a rising GDP growth from 6.0% in 2013 to 8.2% in 2019 (Bangladesh GDP Annual Growth Rate, 2019). But it’s struggling in diversifications of its economic sources which make it economically fragile. It has limited natural resources as well as very limited capability to explore and extract those resources. Almost one-fifth (21.8%) of its population live under the poverty line (Poverty Data: Bangladesh, 2018). In last ten years i.e. FY 2010-2011 to FY 2019-2020, the average BAF budget was only 1.07% of National budget which is nominal for a credible Air Force in this era.

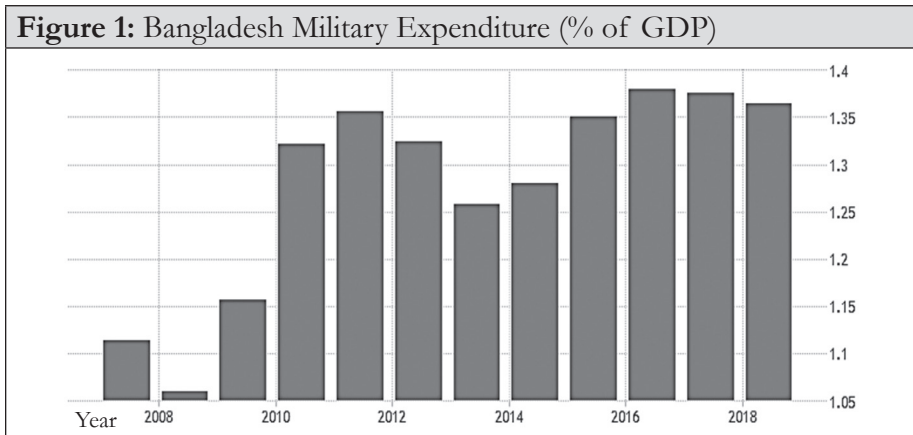


Table 1: Comparative Budget Statement of National, Defence and BAF from FY 1999-2000 to FY 2019-200

Up dated on 10-02-2020 *Figures in crore*

FINANCIAL YEAR	NATIONAL BUDGET	DEFENCE BUDGET	NATIONAL VS Defence Bgt	BAF BGT (Incl wks)	DEFENCE VS BAF Bgt	REMARKS
1999-2000	35934	3217	8.95%	548	17.03%	Rev Bgt(St-2)
2000-2001	39644	3392	8.56%	549	16.19%	Rev Bgt(St-2)
2001-2002	43904	3360	7.65%	572	17.02%	BGT REVIEW
2002-2003	44854	3845	8.57%	557	14.49%	BGT REVIEW
2003-2004	51980	4239	8.16%	622	14.67%	BGT REVIEW
2004-2005	55632	4067	7.31%	723	17.78%	BGT REVIEW
2005-2006	61058	4486	7.35%	1064	23.72%	Rev Bgt(St-2)
2006-2007	66836	5398	8.08%	1132	20.97%	Rev Bgt(St-2)
2007-2008	93608	5951	6.36%	912	15.33%	Rev Bgt(St-2)
2008-2009	94140	6885	7.31%	1066	15.48%	Rev Bgt(St-2)
2009-2010	110523	7875	7.13%	1477	18.75%	Rev Bgt(St-2)
2010-2011	130011	9318	7.17%	1707	18.32%	Rev Bgt(St-2)
2011-2012	161213	12225	7.58%	1930	15.79%	Rev Bgt(St-2)
2012-2013	189326	13503	7.13%	2007	14.86%	Rev Bgt(St-2)
2013-2014	216222	15180	7.02%	2619	17.25%	Rev Bgt(St-2)
2014-2015	239668	17770	7.41%	2393	13.47%	Rev Bgt(St-2)
2015-2016	264565	20694	7.82%	2833	13.69%	Rev Bgt(St-2)
2016-2017	317174	23212	7.32%	3149	13.56%	Rev Bgt(St-2)
2017-2018	371495	26415	7.11%	3593	13.60%	Rev Bgt(St-2)
2018-2019	442541	30701	6.94%	4598	14.98%	Rev Bgt(St-2)
2019-2020	523190	32101	6.14%	4672	14.55%	Initial Bgt(St-2)

Ref: www.mof.gov.bd.budget in Brief/bang (BGT STATEMENT-2)

Small Air Force

A very traditional method of measuring the size of Air Force is the number of aircraft or specifically the number of combat aircraft it possesses. But it may give a misleading picture. Besides the number, it also depends on the capability, technological sophistication, maintenance, sustainability, industrial capacity, age of the platforms etc. However, as a rough guideline the following figures may be considered: Large Air Force-Thousand or more aircraft, Medium Air Force-Several hundred aircraft and Small Air Force Less than two hundred aircraft. A small Air Force is a balanced force that has local capabilities to assume the almost all ranges of airpower operations independently. However, in terms of sustainability and application of quantum of force, maintenance, indigenous production capabilities will be very limited in respect of duration and level. The technological advancement, different strategies, information technology

(IT), Cyber, asymmetric warfare etc. have become added dimension to decide the capacity of an Air Force. And the most important aspect is 'Man behind the Machine' - the population converted with necessary skill can become the most powerful ingredients to decide the capability of an Air Force. It may change the dynamics of smallness or bigness. BAF having total 183 aircraft, out of which only 46 combat and 27 light combat attack aircraft, with limited maintenance and sustenance capacity having no indigenous industry, surely qualifies to be a SAF.

Bangladesh Air Force Perspective

Roles of BAF

The primary role of BAF is to safeguard the airspace of Bangladesh both during peacetime and wartime. During wartime, BAF will carry out both combat and combat-support air operations. War is a conditional situation and generally prevails for a shorter period than that of peacetime in the history of any state. So, it is peacetime roles that demand more attention to train and remain prepared for defending war or warlike situations. The State has to invest much of its resources behind preparing a credible Air Force during peacetime. The peacetime roles become more frequent and prominent to define the performance of the air force. With the change of security dynamics and threat scenario, BAF has to perform her peacetime roles for assisting the government in maintenance of national security by performing air operation other than war. In peacetime, the roles of BAF range from assisting civil administration in maintaining internal security & peace, conducting damage assessment, rescue and evacuation, mitigating sufferings of people affected by natural calamities and to remain prepared for any other task as deemed necessary by the government. Assisting friendly nations in natural calamities is a 'Projection of the Foreign Policy of the Government' that BAF is always executing during peacetime. In this respect, BAF is also playing an important role in fostering military diplomacy.

Goal

The goal of BAF is to build and maintain a well-balanced air force to fight the nation's war whenever needed. So, considering the geostrategic circumstances, threat perceptions and resources, the goal is to evolve accordingly to remain a relevant force. BAF should try to keep abreast with the advancement of technologies and new concepts remaining within the financial capability. BAF also should achieve and develop more interoperability and interdependency with sister services. Finally, a 'Reliable, Relevant, Well-organized and Professional excellence' is a phrase that expresses the goal of BAF.

Threat Perceptions

The very geopolitical location of Bangladesh and many unresolved conflicting interests with her neighbouring states put her in a difficult situation. Both neighbours have social fabric, culture, and religious difference from those of Bangladesh. Acquiring sizeable military capabilities by both the neighbours during last two decades is a major concern. The regional security environment is becoming a new factor. The Rohingya push-in from Myanmar to Bangladesh in 2017 had escalated the tension further. In July 2019, the draft NRC (National Register of Citizens) in Assam, India had raised concern when Bangladesh has been sheltering more than a million Rohingya refugees. It may harm the overall regional peace and security. Besides, the cross-border violation with both neighbours, rise of terrorism, drug-trafficking and internal non-traditional security threats have become common phenomena. At the same time, the trade and energy resources security demand added considerations. Besides fishing and SLOC protection, the vast area of EEZ also needs protection as well as exploration of the energy and natural resources within it. Threats to peace and security in the 21st century includes not just inter-state or intra-state war and conflict but civil violence, organized crime, terrorism and weapons of mass destruction. These also include poverty, deadly infectious disease like COVID-19 pandemic and environmental degradation. Under these

circumstances, Bangladesh, while keeping in mind the traditional threats from her adversaries, must focus with more priority to its socio-economic development, stable domestic environment and peaceful region. The main 'Goal' of BAF therefore is, to ensure security by maintaining a reasonably capable force to pose 'Credible Deterrence' to avoid war.

Present Setup of BAF and Challenges

Operational Capability

BAF has got air defence (AD) fighters, ground-based AD radars and Short Range Missile System (SAM) in her inventory. Most of the AD aircraft are of 3rd (Chinese F-7MB) and 4th (MiG-29B) generation. These aircraft were inducted between 1989 and 2000. However, the later versions of F-7BG and F-7BGI were inducted between 2006 and 2013. Each year the procurement cost is increased by about 20%-50% or more. At the same time, the maintenance cost also increases. The performances of the aircraft are declining too. The AD radars are also very old. With the existing capacity, BAF already has activated AD Identification Zone (ADIZ) in February 2018. It has presented additional challenges to maintain the AD operations. So, to perform the primary role effectively under the existing threat perceptions and to pose credible deterrence BAF has to look for sufficient numbers of modern platforms which will remain effective for next 30 to 40 years or so.

Flying Training and Maintenance

BAF has been conducting basic flying training in Chinese origin PT-6 aircraft. These aircraft have analogue type primary flight instruments. The positive side is that BAF has a Maintenance Unit (MU) to carry out airframe overhauling of these aircraft. But the engines and other flight instrument are still sent to China for overhauling. Any geostrategic change that affects the relationship between Bangladesh and China may hamper the flying training as well.

BAF has been using Bell-206 and Augusta AW-119Kx for training on rotary-wing. The AW-119Kx is a 4th generation European origin helicopter, equipped with modern digital cockpit environment. But some helicopters of subsequent advanced stages are still of older versions like Bell-212 and MI-17. The good part is that BAF has two different MUs to carry out maintenance and overhauling of airframe of these helicopters. But engines and other flight instrument need to be sent to overseas for overhauling. It is another unavoidable vulnerability for BAF. BAF has highly sophisticated European standard platform like Augusta AW-139 helicopter. It has enhanced the Search and Rescue capability both on the ground and at sea in all-weather conditions. The maintenance of this helicopters is easy but very costly. The technicians are yet to become proficient in handling such avionics and engines. Again the spares are available only with certain vendors.

BAF transport aircraft fleet is comparatively in better condition. Very recently (2019-2020) the C-130J variants has been inducted. This versatile aircraft is well equipped and compatible to meet the requirement of this century. But as a SAF, it is likely to be a challenging task to maintain this fleet up to the highest operational standard, if spares are not supplied during requirement. Though the spares of C-130J are more durable, there is no much repair option. The item has to be replaced if it becomes unserviceable which is also a very costly affair.

Other Challenges

Technological Challenges

The aircraft like Yak-130, Augusta AW-119, Augusta AW-139, and C-130J have been inducted in recent years and equipped with contemporary fully digital flight instruments, avionics and electronically controlled engine power systems. Most of their technologies are software-based. The maintenance of these aircraft is the primary challenge. Firstly, spares are not sufficient to replace the unserviceable items. Secondly, there is limited

maintenance facilities available with BAF. And third is, the technicians are not yet qualified fully and acquainted with the maintenance of many items. So, the unserviceable items are sent abroad for repair/overhauling that is a very costly affair. BAF only can acquire the technologies while assimilation of these is very challenging and costly affair. However, should Bangladesh military services, paramilitary services, police and coastguard together make a coordinated procurement plan and acquire same types of aerial platforms wherever possible, then Bangladesh can also have common maintenance, logistics and storage facilities for those platforms.

Geopolitical Challenges

Geopolitical situation puts considerable pressure on creating technological and operational challenges. Both Russia and Ukraine are capable of overhauling the MiG-29 engines. Due to Crimean crisis in 2014, the political relationship between them became volatile. Subsequently BAF had to comply with the high price quoted by Russia for overhauling of the engine which once was overhauled by Ukraine. Again BAF had to delay by more than one year to bring the newly procured five MI-171SH helicopters from Russia due to the USA economic embargo. So, BAF has to find out alternate ways and means to handle such situations in future.

The Rohingya push-in by Myanmar during 2017 and subsequent security situation has given rise of new question, “Why both China and India support Myanmar in Rohingya issue?” (Bhaumik, 2017). Due to their massive investment in Rakhine state, both Asian powers are rendering strong back-up to Myanmar. While most of the AD aircraft, SAM, radars and arsenals of BAF are from China, it puts BAF in challenging situation to upgrade its military orientation. So, BAF must make diverse procurement plan for replacing her platforms and arsenals.

Human Resource and Organization

Contemporary technologies are cardinal for an Air Force while its human resources convert these technologies into capabilities. The Air Force of this century requires highly skilled and trained personnel. Besides operational efficiency, safety is also a paramount consideration. So proper organizational training on modern platforms, avionics, engines, equipment, procedures as well as concepts of safe operations are prime requirement. Cyber, IT, software-based operating system of all equipment etc. are top priority and immediate training on these is essential. Educational meritocracy and productivity should get due importance. However, BAF has up-graded its officer cadet training and airmen training, introduced an 'Air University' and trying to incorporate other training curricula to meet the challenges of the century.

Options for BAF and Future Prospects

As Means to Attain Political Objectives

Bangladesh has less defence in depth. So, inherent characteristics of airpower enable BAF to employ strategically allowing the state to overcome this geographical disadvantage. It is always better to take the war in adversary's territory. It is particularly important and strategically relevant for any small state. Again the advancement of IT and network system, improved air/surface-launched stand-off weapon, Precision Guided Weapons and UAVs has transformed the nature of airpower. By harnessing such advancement in aerial warfare, BAF may not only overcome the traditional limitation of airpower, but also develop her force to maintain a technological edge over adversaries.

Considering the economic development of Bangladesh, the smallness of BAF is rather an advantage. The size of BAF renders it the ability to rapidly introduce new technologies, aircraft and weapon system if the budget flow remains steady or gradually increased. Considering the threat perceptions, budgetary constraint and performing the primary role as well as other

combat roles, BAF should plan to attain 'Credible Deterrence' to preserve peace, not to wage wars. Priority to be given to procure multi-role combat aircraft/helicopter (MRCA/H), quality AD radars, SAM, force multipliers like UAV/UCAVs, AEW and Aerial Tanker to achieve economy of effort. Indigenization of UAVs and R & D sector is necessary to achieve self-reliance. The size of the force may be slim but should be highly efficient.

Employment in Peacetime for Stability and Security

As BAF cannot afford and sustain a protracted war, it is imperative to employ its airpower for peace to prevent war in the first place. So, it is important to develop 'soft power' and attain the ability to employ it. The 'Human Resource Development' (HRD) is one of the focal point in this respect. BAF may establish educational institution or utilize her existing training facilities to provide 'Vocational Education and Training'. Thus, producing skilled personnel for its use, domestic use as well as for export will help in earning higher remittance. BAF may also setup aviation-related industries like 'Maintenance Repair and Overhaul' facilities in the concept of 'Export Processing Zone' (EPZ) where international industries and companies will produce and maintain aviation equipment. It will enhance employment, technology transfer, export and to some extent self-reliance. Establishing Aviation Academy/Flying Schools and Aviation Simulator where civilian aviators can also be trained, maybe another option. It will enhance the capacity of BAF as well as produce required skilled personnel for the aviation sector of both home and abroad. BAF has been supporting in aid to civil power since long for maintaining internal law and order situation. So, establishing dedicated 'Aviation Security Force' for deploying in all the international airports of Bangladesh could be added option.

The airpower due to its inherent characteristics and lethality, is mostly considered for its effectiveness/applicability against enemy. That is the reason its non-lethal aspect gets less attention. But Bangladesh can enhance its international standing as a global citizen and enlarge political manoeuvring space. As a responsible member of the international

community, Bangladesh is already taking part in the UNPSO and HADR missions. As of 31 August 2020 BAF has contributed 7106 personnel. However, BAF should continue taking part in all kinds of UNPSO with the support of national interest. BAF has had many successful HADR missions in its credit both at home and abroad. Bangladesh government using BAF transport aircraft, sent relief goods to Nepal, India, Myanmar, Pakistan, Japan and Iran after they were affected by natural calamities. It demonstrates how a SAF can be used to materialize the national objective in maintaining regional as well as international co-operation & peace. These missions render a wide scope of gaining professional excellence and a unique opportunity to exercise 'Diplomatic Role'. So, BAF needs to give due importance to procure capable aerial platforms equipped with contemporary flight instruments and avionics to mitigate the operational requirements and UN demands.

Modernization

Acquiring and assimilating of contemporary technologies should be done through a modernization plan. If it is not done within a certain period, the technologies become obsolete, lose both operational and economic viability. It may be done in three phases, "Preserve, Promote and Procure". For SAF 'Preservation' is the way to maintain its existing capabilities at the minimum required level. It is done by meticulous maintenance, repair and overhaul. Handling with extra caution as well as lowering the operational margin limit of aircraft and other machineries fall in this phase. 'Promote' or upgrading the equipment comes under the next viable option. Instead of replacing the whole fleet of particular type aircraft, only promoting the new variants of engines, cockpit or weapon system may meet the operational requirement. 'Procurement' or replacement of major aerial platforms and other associates equipment is easy but the costliest option for any Air Force. Here quality of platforms must get the utmost importance over quantity.

Future Prospects

Asymmetric Warfare Capability

On 14 September 2019 the drone attack by Yemen's Houthis brings into focus that both state and non-state actors can use asymmetric tactics, weapons and methods in the aerial warfare domain. This methods and weapons are considered both a threat as well as opportunities. For BAF it is a low-cost opportunity, at the same time BAF has to counter threats from such attacks. In asymmetric warfare there is no contest for gaining control of the air, no classic use of airpower, no air interdiction. BAF may possess such capability by acquiring various categories and numbers of UAVs while countering such use by other actors. BAF may go for initial procurement of such UAVs in minimum quantity and later on must utilize the creativity of young generations for making it indigenously.

Information Warfare (IW) is already in vogue and it is a domain for both military and civilian. So, BAF needs to develop strong and contemporary IW capability. Use of AI is also going to be another facet which will both provide opportunities as well as challenges for all military forces. BAF may invest in achieving these kinds of 'Soft' capabilities by incorporating both its own professionals and civilian experts. BAF may become the common platform for conducting R&D in this respect. 'Bangabandhu Shiekh Mujibur Rahman Aviation and Aerospace University' may become the focal point for this. It will be beneficial in two respects, first it would produce a technology-oriented educated future generation and second, it would provide indigenous capability to produce its equipment or systems. It will also be more economical and militarily viable option in respect of secrecy.

Maritime Air Operation Capability

Taking advantage of settlements of maritime boundaries with both India and Myanmar, it is now time for exploring the 'Blue Economy'. Bangladesh has already contracted Japan to build 'Matarbari Deep Sea Port' project in

Maheshkhali, Chattogram that is likely to be a giant step in this regard. Besides, there are fisheries and huge hydrocarbon deposits in the Bay of Bengal. Now monitoring and protection of these assets will again be a challenge. Thus, BAF needs to attain maritime capabilities like MPA as well as maritime capable MRCA/H and UAVs.

Aerospace Capability

Aerospace Technology is another major contender that deserves both our appreciation and attention. As of today Bangladesh has two satellites (non-military use) in the space. BAF may take lead to send the next satellite for multipurpose uses including military use. It may be done jointly with sister services and other civilian agencies like BTRC, Bangladesh Meteorology Department (BMD), Space and Remote Sensing Organization (SPARSO) but the command & control may remain with BAF.

Synergistic Approach

Developing and maintaining a formidable Air Force for any nation is a costly affair. For a SAF, it is more viable to grow airpower holistically with other services and organizations. In Bangladesh, besides BAF, airpower is also possessed by its Army and Navy. The other paramilitary forces like Border Guard and Coast Guard are also pursuing to have airpower. During wartime all air elements (assigned) of Bangladesh including civil aviation will come under the operational command of BAF. So, it is necessary to develop the airpower in such a way that it can produce synergies. Military, paramilitary and civil aviation must integrate to take advantage of each other's capacities to produce better efficiency, provide better options and above all become more cost-effective. It will allow to overcome resource constraint, reduce training & maintenance cost, save time and fuel and above all produce a mind-set to serve together for the national interest.

Recommendations

From this research and findings following recommendations are made primarily in the context of BAF. However, these may be commonly applicable for other SAFs also. These are recommended that BAF may:

- Attain credible deterrence by procuring modern superior quality MRCA/H including western origin AD radars, SAM systems and UAVs.
- Acquire and assimilate the contemporary technologies through comprehensive modernization plan i.e. “Preserve, Promote and Procurement” in phases.
- Acquire maritime capable MRCA/H and UAVs.
- Take part in national HRD by establishing Vocational training school to develop skilled manpower.
- Set up MROs in the form of EPZ.
- Establish a dedicated ‘Aviation Security Force’ for deploying at all international airports of Bangladesh.
- Continue taking part in UNPSO, HADR and MOOTW.
- Incorporate asymmetric warfare capability.
- Invest in achieving EW, AI and other Soft skill capabilities.
- Take lead to send the next satellite for multipurpose uses especially for military uses.
- Take lead role to produce synergies in the airpower by integrating the airpower of all agencies such as military, paramilitary and civil aviation etc.

Conclusion

The purpose of this research was to find out the security challenges of the 21st century faced by SAFs, vis-a-vis the prospects and options to remain effective by mitigating those challenges, particularly for BAF. Besides numerous changes and developments, there are geostrategic, geopolitical, economic and environmental challenges for SAFs. Thus, the new security environment in this century has introduced a paradigm shift globally in security concept and defence. Air Forces being technology-based, face multifaceted challenges to cope with the changes in newly emerging security threats emanating from all these changes. Science, technological changes and economy play vital roles. Thus, it is more prominent and challenging for a small state and SAFs with limited economy and budget to cope with those changes. To remain relevant and capable as a deterrence, it is both a necessity and demand of the time to update the capacities of an Air Force. On the other hand, new technologies have also brought prospects like IT, UAV, AI, IW, asymmetric warfare etc. The HADR and MOOTW has gained international importance for fostering humanity, relationships and military diplomacy by utilizing Air Force.

Considering the existing threat perceptions, budgetary constraint and roles, BAF should plan to attain 'Credible Deterrence' to preserve peace not to wage wars. Regional peace and security is essential for national development as such BAF needs to prioritize and incorporate a comprehensive modernization plan remaining within budgetary constraint. It is also very essential to produce robust 'soft power' and attain the ability to employ it. Within the small budget should airpower be impregnable, it should grow jointly with other services and integrate to take advantage of each other's capacities.

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