

NEED FOR DOCTRINE DEVELOPMENT CENTER IN BANGLADESH AIR FORCE

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Introduction

Bangladesh Air Force (BAF) has come across the experience of more than four decades since her inception. Role and task of BAF have become diversified with new challenges and with a wide range of operating area beyond the boundary of Bangladesh. In this process 'BAF is undergoing modernization plan that includes organizational expansion and induction of many new systems and equipment to have a compatible tooth to tail ratio by 2030' (Esrar 2017, 11 April). This effort demands innovative strategies to develop compatible concept of operation to deal with the fast changing operational requirement.

Any professional air force should regularly re-evaluate its doctrine, strategies and operational concept through a formal process under an organizational set up or institute. Moreover the fast changing technology is directly contributing to the threat perspective. Therefore, appropriate doctrine should be developed to ensure that BAF can meet the challenges of any future conflict or war. This would help BAF to develop operational concepts, design a balanced force structure, standardize its training system and make optimum use of its resources. It needs to be determined that how best BAF could adopt a systematic approach towards development process. Without a systematic approach the whole development process of BAF is likely to be counter productive for effective employment of air power.

Standardization and Evaluation of Operational Concept and Improving Professional Skill

Requirement of Standardization and Evaluation in BAF: The future operational requirements are likely to become increasingly more

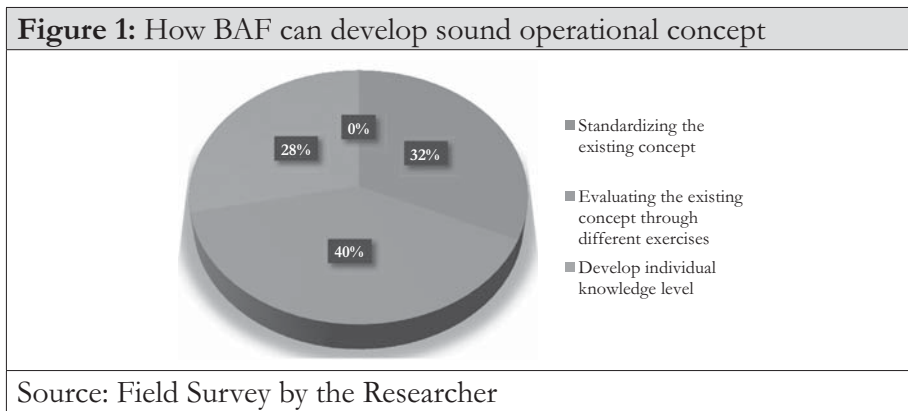
complex and dynamic. Continuous evaluation would enable our Air Force to become more adaptable and flexible in its planning, preparation and execution of operations. BAF should continue to strive for excellence in operations based on a distinct knowledge edge. The knowledge edge can be maintained through demanding and realistic training guided by relevant operational concept. This needs to be done through a continuous process of standardization and evaluation. (Hasan 2017, 20 August)

Present Method of Standardization and Evaluation in BAF: At present the Directorate of Chief Inspector is conducting the performance evaluation of units and bases which is mostly done with the help of some preselected indicators. That does not really serve the purpose of standardization and evaluation for identification of capability gap and provide solutions. Ideally this is supposed to be done by a formal institute that is capable of developing doctrine and operational concepts, which is not there in BAF at present.' (Al-Amin 2017, 20 September)

Standardization of BAF Operational Concept: The uncertainty and complexity of future operational environment will require BAF to respond to a broad range of threats and challenges. The increasing speed at which the effect of conflict appear in the operational environment will continue to challenge the commanders and operators to deal with a greater number of events and activities over a shorter period of time. Therefore, simply knowing where an adversary is maneuvering will no longer be sufficient, leaders must understand the intent of an adversary in the real time. (US Army TRADOC 2012, p.16) This would require BAF to analyze the future operational environment and develop contemporary operational concept to adopt with the fast changing operational environment.

Developing Contemporary Operational Concept: BAF must be prepared to defeat the future threats who would try to evade our strength and try to attack what they perceive as weakness. As part of the preparation BAF need to peruse for the emerging technologies to maintain its strength, address the weaknesses and exploit opportunities. In this process BAF

can develop contemporary operational concept and counter measures to defeat future threats and remain as a credible force. ‘At present because of not having a formal institute the existing operating procedure and concepts are not developed through a systematic way. Because the compatibility of operational concept would depend how methodically it is designed and planned.’ (Syed 2017, 03 August). A survey over 60 senior officers from all three services are asked, “How BAF can develop compatible operational concept” and the response is shown below.



Deduction: BAF can develop sound operational concept through standerdizing and evaluating the existing concept and by developing individual knowledge level.

Force Structuring: BAF needs to develop a credible force which would be flexible, technologically advanced and capable of protecting the airspace of Bangladesh from any threat. ‘In the present context to develop an Air Force with state of art equipment and systems need a huge amount of budget that our economy would not be able to afford fully. Thus, resource constrain is one of the most prominent challenges for us. Yet BAF need to make a balance between the affordability and capability building. Determining the requirement through proper research and analysis, selection of correct equipment and setting the correct concept of operation would be the appropriate way.’ (Hasan 2017, 20 August)

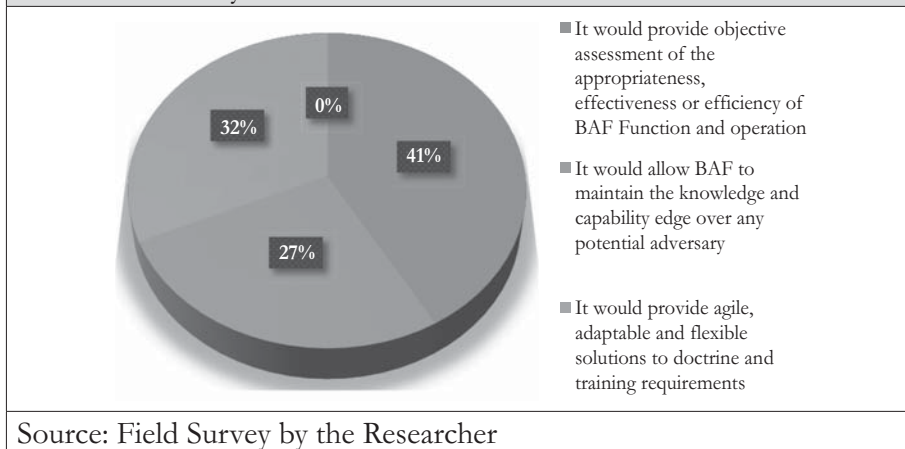
Standardization of BAF Training System: ‘The standardization for the academic training at different stages would be done through a continuous assessment program of monitoring the outcome and analysis for improvement. There needs to be a Standardization and Evaluation section will be the responsible work center to perform this task. They will also draft the policy guideline related to all types of training in BAF.’ (Tanveer 2017, 30 June).

Modification and Synchronization of Training According to the New Equipment and System: Whenever there will be any induction plan for new equipment and systems the Standardization and Evaluation section will be tasked to analyze and suggest necessary modification of the existing training program to interface the man and machine. ‘Merely having a small group of people trained on the new equipment would not help the total system to match with the new induction. For effective utilization of the equipment this systematic modification and implementation is necessary.’ (Syed 2017, 03 August) After the modification of training system for a particular equipment that needs to be synchronized with rest of the system to function effectively. This synchronization is not possible only by the user unit alone. This must be done through a systematic way.

Enhancing Professional Skill of BAF Personnel: Professional knowledge of BAF personnel is closely related to the overall efficiency of BAF as a whole. ‘BAF personnel maintain and operate very modern fast evolving technology driven equipment. It is the skilled man behind the machine who ensure smooth functioning of an organization like BAF. Through evaluation we can reveal the weak areas/drawbacks and work on to enhance professional skill. Through standardization we set a benchmark and endeavor to maintain that by dint of professional skill.’ (Sayed 2017, 03 August) In this regard 60 surveyed are asked about their opinion whether standardization and evaluation of operational concept and training system would help to enhance the professional skill of BAF personnel and the majority respondent opined that standardization and evaluation of operational concept and training system would help to enhance the professional skill of BAF personnel.

Requirement for Research and Analysis in BAF: Research and analysis is generally meant as a systematic, objective assessment of the appropriateness, effectiveness or efficiency of an initiative, policy, project, service, function or operation. The application of research and analysis processes to doctrine and training would allow BAF to maintain the knowledge and capability edge over any potential adversary by providing contemporary and flexible solutions to doctrine and training requirements. From the above mentioned discussion it is clearly evident that none of the qualifications or capabilities can be achieved without the research and analysis. Moreover, this has to be done in the form of standardization and evaluation under an organized intellectual institute. The requirement for research and analysis in BAF has been tested through a survey over 60 mid-level senior officers from all three services and the response is shown below.

Figure 2: What is your opinion about the requirement to institutionalize research and analysis in BAF



Deduction: It is required to institutionalize research and analysis in BAF for multiple benefits that includes efficiency of BAF function and operation, maintain knowledge edge and solutions to doctrine and training requirements.

Preparing an Academic Discipline for War Fighting Role

Why Doctrine is Needed for Air Force: The guidance for proper use of airpower in military operations can be determined from an Air Force doctrine. Thus the Air Force doctrine becomes the foundation and reference for employing Air Power in the best possible way. In other way doctrine comprises of the essential modalities by which the Air Force can design and formulate its actions in support of national objectives; it is the cornerstone of successful any military operations. (USAF Doctrine 2011, p.2) Therefore, BAF needs to develop its own doctrine which would suit its own force and help develop the force structuring, operational concept, employment etc.' (Sayed 2017, 03 August)

How BAF Can Have its Own Doctrine: Doctrine would represent a statement of the BAF approach to operations and it also provides the knowledge base for others who have a need to understand how BAF would operate. This includes the Government, civilians within Defence and other departments and agencies involved in activities and operations alongside the BAF. (Australian Defence Doctrine Publication 2006, pp.2-6) 'In some instances where experience is lacking or difficult to acquire, doctrine may be developed through analysis of theory and assumed actions. Doctrine is constantly changing as new experiences and advances in technology point the way to the force of the future.' (USAF basic Doctrine 1997, pp.1-2) In this regard a formal intellectual institute would help BAF to develop its own doctrine.

A Possible Model for Doctrinal Process: Doctrine is integral to the capability development process. 'To ensure the optimum utilization of resources and capability integration, the doctrine should be developed first then to identify and determine the capability requirement. It should follow a loop of a formal doctrinal process that would probably help the capability integration' (Zaman 2017, 31 August). The model is depicted in the following figure and is described in the following paragraphs (Australian Defence Doctrine Publication 7.0, pp2-6).

Figure 3: A Prescribed Doctrine Model



Source: Developed by the researcher taking reference from the Australian Defence Doctrine Publication 7.0, p.6

- **Analyse:** The ‘Analyse’ phase of the model examines the inputs to determine their impact on current doctrine or the requirement to develop new doctrine as a result of these inputs.
- **Develop:** The ‘Develop’ phase of this doctrine model involves examination of the concepts and plans produced in the ‘Analyse’ phase to determine the best doctrinal solution.
- **Produce:** The ‘Produce’ phase implements the doctrine project plan scoped in the ‘Develop’ phase. This covers all aspects required to draft, approve, publish and disseminate doctrine.
- **Evaluate:** Doctrine is dynamic and should evolve over time to meet the changing circumstances that is expected to be faced. The ‘Evaluate’ phase determines whether, and to what extent, the doctrine has met force’s requirements. Evaluation may be undertaken formally or informally.
- **Review:** The ‘Review’ phase can be conducted at any time in the execution of the model. The review process is particularly important at the end of each of the other phases. The review of each phase allows scrutiny of the processes used and outcomes achieved. It is a quality assurance mechanism that has an internal focus.

Implication of Doctrine: Doctrine provides a framework for organizing, planning and employment of air power. It is rather essential to establish such Doctrine Development Center which would provide these very fundamental elements which would intern help develop academic discipline for rational growth and war fighting role of BAF. (Sayed 2017, 03 August) 'BAF doctrine would primarily be targeted at its members of all levels' (Zaman 2017, 31 August). Therefore to prepare an academic discipline for warfighting role it is necessary that the implication of doctrine is understood by BAF personnel at different levels.

Levels of Doctrine: In a classical way of implementing the Air Force doctrine it normally affects operations at three different levels i.e. basic, operational, and tactical. These levels are more concerned about the intellectual content of the doctrinal concepts, but not for the architectural structure of doctrine publications. (UASF Doctrine 2011, p.8)

- **Basic Doctrine:** The basic doctrine describes the “essential properties” of airpower and provides the perspective of Air force professionals. Based on its fundamental and enduring character, basic doctrine provides broad and progressive guidance on how an Air Force should be organized, employed, equipped, and sustained.
- **Operational Doctrine:** The operational doctrine explains about the details for a force how it should be organized vis a vis the application of principles of basic doctrine to military operations. The main focus of operational doctrine is towards developing the missions and tasks that need to be executed through tactical doctrine.
- **Tactical Doctrine:** The tactical doctrine mainly describes the appropriate employment of specific Air Force assets, individually or jointly with other elements, to accomplish detailed objectives. Tactical doctrine is focused on particular objectives (carrying out dive bombing) and conditions (threats, weather, and terrain). Air Force tactical doctrine is codified as tactics, techniques, and procedures which is termed as TTP.

War Fighting Role of BAF: BAF is responsible to safeguard/defend the air space of Bangladesh. To attack on enemy's offensive power and on centers of his power of resistance in times of war. To create favourable air situation for assisting the Army and Navy in times of war. To provide long range air transport support for strategic movement of land and other forces. To provide tactical transport support for carriage and supply of airborne or air transported troops. To assist the civil administration in maintaining internal security and peace, and to support general population in the event of natural calamities whenever called for such duties. (BAF Draft Operational Doctrine 2014, p.2B-1)

Application of Doctrine for Warfighting Role: The focus of Air Force doctrine remains on the best possible way to obtain warfighting effects irrespective of the medium in which an air platform would operate. For example, an Air Force professional is generally concerned with the best means of employing intelligence, surveillance, and reconnaissance (ISR) capabilities, rather than a particular ISR platform is airborne or in orbit. (USAF Doctrine 2011, pp.5-6)

- **Effects:** Doctrine should talk about effects, not platforms. The focus of doctrine remains on the desired outcome of a particular action, not just on the system or weapon itself that provides the whole effect.
- **Using Mediums:** Similar way the doctrine normally talks about using mediums, not owning mediums. This explains the importance of a medium how properly it should be used to obtain the best possible warfighting effects.
- **Right Force:** Doctrine provides direction for the right amount of force, not just equal shares of the force. This amplifies the appropriate mix of Service components in a joint environment.
- **Having Own Doctrine in BAF to Perform War Fighting Role:** 'A Doctrine Development Center should be able to provide the doctrine and policy guideline for BAF. This would ultimately contribute for the effective employment of air power thus helping

to perform the war fighting role.’ (Zaman 2017, 31 August) A group of 60 surveyed are asked “Whether BAF needs to have own doctrine or not” and “Should having own doctrine help BAF to perform its war fighting role more effectively”.

Majority of the respondent opined that BAF should have own doctrine and it would help BAF to perform its war fighting role more effectively.

Developing the Mindset for War Fighting Role: The 60 surveyed are again asked to set the priority for BAF to develop its mindset for war fighting role. The result came out as ‘preparing an academic discipline’ would be the first priority. Rest of the conditions ‘Develop indigenous engineering capability’, ‘Procure state of art platform for war fighting’ and ‘Develop hybrid concept’ were placed as the second third and fourth priority respectively.

An Approach Towards Systematic Development Process

Development Planning: The Development Planning Guide of USAF Material Command defines Development Planning as a collective process of connecting the needs for air force’s identified capability to the planning for acquisition of correct equipment and systems. In pursuit of new capabilities the Development Planning needs to include few basic requirements like analysis, quality assessments, thorough studies, strategies, and options. Two important key elements of Development Planning are analytic support for identification of needs and development of requirements for potential equipment and systems. (USAF Development Planning Guide 2010, p.2)

Objective of Development Planning: The objective of Development Planning is to ensure the launching of major programs that would deliver warfighting systems with appropriate capabilities at the right time with correct cost. Development Planning is not a separate phase of acquisition, rather it is a best practices process to ensure successful acquisition planning. (USAF Development Planning Guide 2010, p.2) A dedicated team need

to be assigned for doing the Capability Based Planning under a formal institutional process.

Capabilities-Based Planning (CBP): The Capability Based Planning in Air Force is the systematic planning process to provide capabilities suitable for a wide range of challenges and circumstances which is aimed for achieving the desired effect in a specific battle space. Therefore the Capability Based Planning is inherently an analytically sound, repeatable, and traceable process to identify, assess, and prioritize Air Force capability needs. (USAF Development Planning Guide 2010, p.3)

Examining BAF Development Plan for Modernization

- **Organizational Expansion:** As part of the modernization plan BAF has planned for organizational expansion to meet the growing need. Most of the proposals for new establishments have come through experience and existing shortfalls. This plan could be made more effective if it would be guided by any concept of operation or through any kind of research and analysis through a formal institute like Doctrine Development Center.
- **Induction of New System and Equipment:** In similar way the modernization plan of BAF includes induction of different equipment and system. Plan for any type of equipment or system does not follow the Capability Based Planning process in true sense rather this is mostly guided by the availability in the market and budget constrain. (BAF procurement Procedure 2010) This is not guided by the operational concept derived from own doctrine. Therefore, the effectiveness of those equipment and system would be in question in time of employment in real war scenario. 'It is of great concern that we are not adopting to the current operational environment which cause for reassessing the geo-political scenario and long term threat assessment. Only then we will be able to understand what should be our future force structure and that would be highlighted in the next Forces Goal i.e. FG 2050.' (Hasan 2017, 02 August)

- **Shortcomings of Present Acquisition Process:** Acquisition of equipment and system in BAF is mostly guided by the present procurement procedure as prepared by Armed Forces Division (AFD Procurement Procedure 2010). The major problem here is the absence of systematic process to identify the capability gap and determine the capability needs. Because there is a distinct difference between identification of requirement and procurement procedure.

Ways for Integration of Capability Building Efforts: There needs to be integration of capability building within the service. There are different units and squadrons in BAF operating different equipment performing different role and task. Integration is not merely the synchronization, rather integration is aimed at improving the overall efficiency and better output. Capability building efforts of all three services needs to be guided by the joint doctrine. Individual services doctrinal process should also be integrated to achieve synergy in case of joint operation. In this process the development plan formulated by a formal institute like Doctrine Development Center can improve true efficiency of BAF.

Systematic Development Process: 'For achieving the desired outcome and objectives one should follow an appropriate organizational philosophy which helps in translating strategy into actions. It also helps in understanding the force requirements and weaknesses of her own force. For a systematic development process, BAF needs a road map, irrespective of individual/government, the road map should foresee next few decades; what should be the capability of BAF. Based on the plan, short-term and mid-term plan should be laid out. (Belal 2017, 06 August) 'A Doctrine Development Center in BAF will be the right /appropriate institute having dedicated, skilled and experienced manpower who can formulate doctrine, policies and operational concept which will ultimately lead towards a systematic development for having a balanced force structure.' (Hasan 2017, 02 August)

Balanced Force Structuring: If a systematic development process is followed through research and analysis, then it would be possible to correctly

identify the capability needs helping to design and plan for a balanced force structure. 'Without a doctrinal process systematic development is difficult. A Doctrine Development Center would help BAF to outline a systematic, logical and consistent approach for her growth.' (Belal 2017, 06 August). In this regard survey respondent opined that a balanced force structure would help BAF for effective employment of air power.

Doctrine Development Center: A Think Tank Institute for BAF

What is a Think Tank Institute: Think tank Institute is a leading strategic tool for the management of knowledge. As a hybrid organisation, it is founded on the management of information and knowledge, drawing on the processes of knowledge management and on expert researchers. (Urrutia Olivier 2013, p.7) An Institute that is capable of providing a Defence Force that needed a clear long-term vision of the way in which that force is expected to operate. It should be able to help provide Defence strategy, capability development and provide the foundation for military education by formulating doctrine and operational concept.

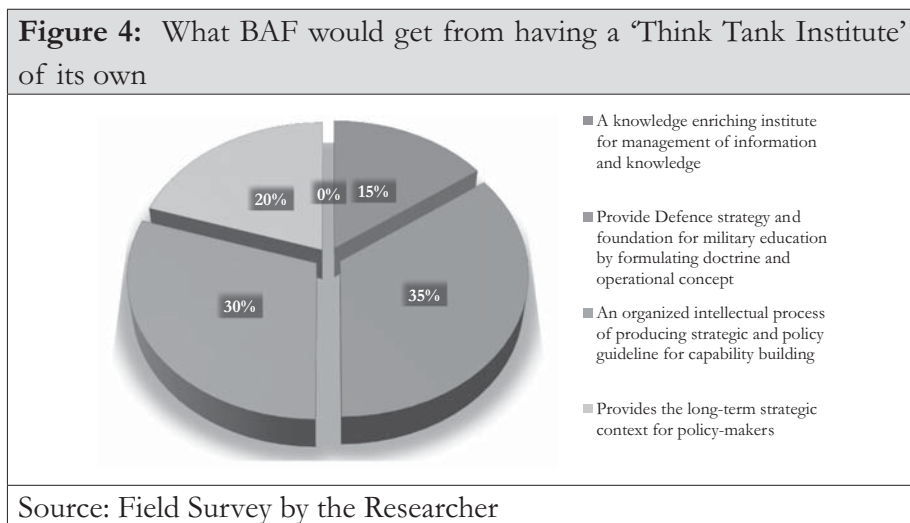
Criteria for Think Tank Institute: Following are some of the criteria identified for the definition of a think tank institute to suit the requirement of BAF:

- A formal intellectual institute for knowledge enriching.
- The research area of the institute is to fulfill the general interest of BAF.
- A permanent work team focusing on research and analysis.
- The production of innovative proposals and prospective Air Force policies.
- An independent organization. The level of independence in BAF could be determined by its statutes and financing sources (separate budget with independent administration).

- An organization equipped with the communication resources (website, blogs, publications, conferences etc.) in order to disseminate information to as broad an audience as possible.

Purpose of Having a Think Tank Institute in BAF: Having a think tank institute of its own, BAF would be benefited with supplies of information, knowledge and innovation. It would also provide proactive intelligence to avoid perceived risks and threats. (Urrutia Olivier 2013, p.7)

Expected Output: While carrying out the survey on the output that BAF would expect to achieve from having its own Think Tank Institute the response was quite exhaustive.



Deduction: Having a Think Tank Institute for its own BAF would get a knowledge enriching institute which would provide an organized intellectual process of producing strategic and policy guidance for capability building, formulate doctrine & operational concept.

Role and Task of Doctrine Development Center as a Think Tank Institute in BAF: ‘The BAF Doctrine Development Center should develop the doctrine and guidance addressing people of all spheres

in BAF. It should also conduct seminars and workshops involving all concerns, which contribute in enhancing the overall efficiency of BAF' (Zaman 2017, 31 August). 'If structure our Doctrine Development Center encompass with different cells like; Operational Art, Doctrine Review & Writing cell, Force Modernization cell, Center for Air Power Studies etc. then it would be able to perform the role of a think tank body in BAF' (Sayed 2017, 03 August) From the above discussion it perceived that the Doctrine Development Center would be capable of accomplishing diverse tasks to perform the role of a think tank institute in BAF. The identified tasks are discussed below:

- Research and Analysis.
- Standardization and Evaluation.
- Preparing Doctrine.
- Preparing policy guideline including legal issues.
- Developing Concepts.
- Providing strategic guideline for Development Process.
- Capability Integration and Force Modernization.
- Integration with Other Services.
- Wargaming and Simulation.

Proposed Organizational Structure of Doctrine Development Center: Considering the role and task of Doctrine Development Center a workable organizational structure is proposed here which is expected to meet the requirement of BAF and expected to perform the role of a Think Tank Institute in BAF. This will be an independent organization with own administrative facilities and having separate budget only dedicated to meet its total requirement. The Institute will have different Directorates with distinct responsibilities. The proposed directorates of the institute are mentioned below:

- Directorate of Research and Analysis
- Directorate of Standardization and Evaluation

- Directorate of Doctrine
- Directorate of Strategy
- Directorate of Policy and Legal
- Directorate of Concept and Development
- Directorate of Capability and Force Modernization
- Directorate of Wargaming and Simulation
- Admin and Services Support Unit

Recommendations

Upon the findings of this research following recommendations are placed in regards of development process of Bangladesh Air Force:

- BAF may take necessary steps to establish a Doctrine Development Center with immediate effect.
- The proposed organizational set up may be considered while establishing the Doctrine Development Center in BAF.
- The institute may be allowed to coordinate independently with similar institutes of other organization (government and non-government) for knowledge sharing and take technical and expert support for the interest of BAF.

Conclusion

It is obvious that any professional air force should regularly re-evaluate its doctrine, strategies and operational concept through a organized process under a formal institute. The same is very much applicable for BAF while trying to match with the contemporary air forces. Therefore, appropriate doctrine should be developed to ensure that BAF can meet the challenges of performing its war fighting role. Determining the requirement through proper research and analysis, selection of correct equipment, setting the correct concept of operation, train and organize according to the changing

operational environment would be the ways to meet the challenges. It is quite evident that achieving these qualifications or capabilities is not possible without the research and analysis in the form of standardization and evaluation under an organized intellectual institute. But with the present organizational set up of BAF it would not be possible to perform this particular task in a professional manner.

The very inter-relation between the doctrine and warfighting role is closely tied up which affects operations at three different levels i.e. basic, operational, and tactical. However, to develop the mindset for war fighting role BAF needs to prepare an academic discipline as the first priority. It is necessary for the Air Force to adopt a systematic planning process to provide capabilities suitable for a wide range of challenges and aimed for achieving the desired effect in a specific battle space. Therefore a balanced force structuring is necessary for effective employment of air power by BAF. To achieve this BAF needs to have its operational concept in place to identify the capability gaps and design a balanced force structure. Therefore, a Doctrine Development Center will be the right and appropriate institute to formulate doctrine, policies and operational concept which will ultimately lead towards a systematic development for having a balanced force structure.

Bibliography

Books

1. CLIFF, R. (2012) The Development of PLAAF's Doctrine. In: HALLION, R. CLIFF, R. SOUNDERS, P. (eds.) The Chinese Air Force Evolving Concepts, Roles and Capabilities. Washington D.C: NDU Press.
2. LEWIS, L. KHALILZAD, Z. M. and ROLL, C.R. (eds.) (1997) New-Concept Development a Planning Approach for the 21st Century Air Force. Washington D.C: Rand.

Manuals/Doctrines/Thesis Papers

3. Air Force Basic Doctrine, US Air Force Doctrine Document-1, published in September 1997.
4. Air Force Doctrine Document-1, USAF, published on 14 October 2011.
5. Air Force Instruction 10-601, Operational Capability Requirements Development, USAF, 06 November 2013.
6. Australian Defence Doctrine Publication 7.0, published by Australian Defence Headquarters in January 2006.
7. Development Concepts and Doctrine Center (DCDC), MOD's Independent Think Tank, UK Ministry of Defence, Published by Secretary of State for Defence, September 2014
8. Development Planning Guide, Material Command of USAF, published on 17 June 2010.
9. Draft Operational Doctrine of Bangladesh Air Force, Annex-B to Chapter-2, Role of BAF.
10. Moshe Schwartz, Defence Acquisitions: How DOD Acquires Weapon Systems and Recent Efforts to Reform the Process, a report prepared for the members and committee of congress, published by Congressional Report Service, 23 May 2014
11. TRADOC Regulation 71-20, Concept Development, Capabilities Determination and Capabilities Integration, Headquarters US Army, Fort Eustis, Virginia 23604-5700, 28 June 2013.
12. United States of America, Air Force Material Command Directorate of Intelligence and Requirement, (2010) Development Planning Guide. HQ AFMC. (AFMC/A2/5)

Article/News Paper/Letter

13. Edson and Frittmann, Illustrating the Concept of Operations (CONOPs) Continuum and its Relationship to the Acquisition Lifecycle, an article published by Analytic Services Inc, (ANSER.org) & The Applied Systems Thinking Institute (ASysTi.org) 2900 South Quincy St. Suite 800 Arlington VA, 22206
14. IMANOTAI, N. (1997) Creating the Royal Thai Air Force Doctrine Process. A research report submitted to the faculty in partial fulfillment of the curriculum requirement. Air War College, Alabama, USA. pp. 12-2
15. Schmitt John F, A Systematic Concept for Operational Design, an Article available at this site: http://www.au.af.mil/au/awc/awcgate/usmc/mcwl_schmitt_op_design.pdf
16. STAIN, D.J. NOLAN, K. and PERRY, R. (eds.) (1988) Process and Problems in Developing NATO Tactical Air Doctrine. A research note. N-2416-AF. Santa Monica, CA. Rand.
17. The Role of Think Tanks in the Definition and Application of Defence Policies and Strategies, an article by Olivier Urrutia published in Revista del InstitutoEspañol de EstudiosEstratégicosNúm. 2 / 2013.

Internet

18. <<https://www.gov.uk/government/groups/development-concepts-and-doctrine-centre>>Accessed on 28 February 2017.
19. <<http://www.au.af.mil/au/afri/aspj/airchronicles/apj/apj92/sum92/drew.htm>>Accessed on 01 March 1, 2017.

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