



**Capacity Building of Bangladesh Army Corps of Engineers in
Nation Building Projects: An Evaluation**

Submitted to

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Gazi Mosharrof Hossain

ACRONYMS

Acronym	Meaning
ECB	Engineering Construction Battalions
TO&E	Table of Organization and Equipment
BUET	Bangladesh University of Engineering and Technology
OJT	On Job Training
SCM	Supply Chain Management
QCA	Quality Control and Assurance
FGD	Focus Group Discussion
HRD	Human Resource Development
MRT	Mass Rapid Transit
LDC	Least Developed Country
BSc	Bachelor in Science
CE	Civil Engineering
JCOs	Junior Commissioned Officers
NCOs	Non-Commissioned Officers
DPP	Development Project Proposal
PIP	Project Implementation Plan
GIS	Geographic Information System
PPR	Public Procurement Rules

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Abstract

Bangladesh Army Corps of Engineers contributes to various nation-building projects where Engineering Construction Battalions (ECB) play the lead role. Besides performing the habitual job, ECB at present day are highly involved in various complex projects which put additional pressure on their existing capacity. Keeping this in mind, the major objective of this study is to analyze the contribution of ECB in nation-building projects with their existing workforce and equipment. Subsequently, the capacity building of ECB will also be evaluated to meet the critical requirements of nation-building projects. The key research question of this paper is how the capacity building of Bangladesh Army Corps of Engineers can enable them to contribute more in nation-building projects. This study is based on content analysis which covers military articles, journal papers, and books etcetera. To substantiate this, a small quantity of Interviews, Focus Group Discussions and Case Study were carried out. The researcher identified that ECB are not self-sufficient enough to implement any nation-building projects without subcontracting with their existing manpower and equipment. Due to the simultaneous involvement of ECB in diversified nation-building projects, capacity building of ECB is often overlooked which does not enable them to equip for future projects and higher requirements in the construction sector. Key Informant Interviews enabled the researcher to correctly unveil the truth that ECB can undertake any project if their present capacity is developed. Basing on the findings of the research, it is recommended that ECB may arrange regular 'Development Programs' on Project Management, GIS, PPR and few other technical aspects for officers and junior leaders for their effective capacity building.

Key Words: Engineering Construction Battalion, Nation-building Projects, Capacity Building, Project Management, Bangladesh Army

Introduction

The government of Bangladesh has taken numerous projects in infrastructure development in the recent past. These structural works are in line with the Sustainable Development Goals 9 and 11, which are the two key drivers for ongoing and upcoming construction projects. Bangladesh Army established its reputation by participating in nation-building projects since its inception. It is to mention that this phenomenon of rendering service to nation-building by Armed Forces personnel also prevailed in many developed and developing countries (Koonings 2002). In almost all cases, members of the Corps of Engineers have been engaged in implementing the engineering projects. While working through various projects, the capacity building becomes an inclusive part of any development work. However, individual and organization can benefit out of any development work, if the capacity building is endorsed in the system.

The Corps of Engineers mainly participate in nation-building projects with their existing workforce and equipment. However, recent project works undertaken by the government, demand some additional capacity and skillset. To cope with the imminent inflow of development projects, it is imperative to analyze the prospects of capacity building for nation-building projects, identify the challenges and determine the means of mitigation. An inclusive capacity building of the Corps of Engineers will increase the contribution of the Bangladesh Army in the construction sector and ensure a quality of service to the nation. It is perceived that the present capacity of the Corps of Engineers may not develop instantly, but a start during present construction boom will surely facilitate for the future.

Literature Review

Involvement of ECB in various nation-building projects is not elaborately discussed in open source resources. Moreover, the capacity building of ECB is always an overlooked topic to converse in proper brainstorming sessions. After the relevant study of resource material, it is evident that this particular topic was not addressed in any of the related articles, books or papers. There are few write-ups in online where the issue is not discussed from the viewpoint of Bangladesh Army Corps of Engineers.

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More so, all engineering project works are focused on the employment of civilian resources. Some of those existing literature was reviewed to get some insights into those previous research works.

Table of Organization and Equipment (TO&E 1994) elaborately discusses the existing capacity of ECB. A related study finds out that during peacetime and wartime, ECB maintains their mission and goal, keeping this TO&E in perspective. Another study conducted by M. A. Saleh (2015) also supports the above, and the concluding remarks of that study were that working procedure of ECB is always followed by their TO&E to complete any project work. However, if any additional equipment is required that is processed separately. Construction work of national highways requires higher classifications than that of ECB, which is reported by a paper of Special Works Organization (2008) where it opined that during the war, ECB are expected to construct roads up to class 12 only.

One newspaper article of Daily Sun (2019) accepts the fact that ECB have contributed in many nation-building projects like construction of Marine Drive Road, many roads in the Chittagong Hill Tracts and number of flyovers. Out of those, ECB have hired consultants for the construction of few complex projects like Marine Drive Road, Hatirjheel Project, construction of flyovers and the like. A research conducted by M. M. Rukanuzzaman (2010) stated that in such cases, the designs are sought from Bangladesh University of Engineering and Technology (BUET) or any other recognized consultancy firm.

Importance of land acquisition for any project work is very much necessary. This is further stated by a research done by S Al Atahar in 2010 where he mentioned that our country needs a well-formulated resettlement policy to address the issues and problems associated with land acquisition. However, ECB does not have any skill required for such an important undertaking related to land. Furthermore, M. M. Rukanuzzaman (2010) also stated that a majority of the initial works of any project is being undertaken by the government agencies and often partially subcontracted to private agencies. This clearly brings out the fact that the capacity of ECB is not developed to undertake such important project works alone with their existing state.

On the question whether other nation's army engineers can take self-sufficient construction projects or not, Qamrul Reza (2018) concluded that in those countries most of the national level projects are directly assigned to the army engineers by the government. Besides this, some of the organisations adopt partial outsourcing while others solely employ their integral resources. However, none of those projects was implemented by complete outsourcing. M. M. Hossain (2009) carried out a study on the challenges of ECB in Infrastructure Building and found that it is time to get out of the traditional context of project work and the level of expectations have increased.

Review of the literature shows that few studies have so far been conducted in Bangladesh for finding out the challenges of ECB to work better. Although some of the studies did find a few relevant factors behind the lacking of ECB to take up self-sufficient national level projects; however for improving the capacity of ECB, knowing those limiting factors are not enough. Instead, a comprehensive study is needed that will unveil most of the underlying challenges of ECB to undertake self-sufficient construction works to contribute more. Hence, this study will help to fill this void in the literature by addressing the areas that will boost the capacity of the Corps of Engineers to complement the nation-building projects.

Problem Statement

The capacity building focuses on developing human resources as both individual and organization to take more responsibilities. Every member of an organization may have great potentials those need to be developed for organizational prosperity. Concept of capacity building values the employees for organizational growth. Armed Forces around world nurture capacity building in terms of training for skill development. To illustrate, many regional Defence Forces also conduct regular seminars on capacity building and awareness to evaluate and update their systems. The United States Army also conducts scenario-driven exercises to examine its Human Resource Command capabilities (Ralph Masi 2009). In line with other armies of the world, Bangladesh Army also focuses on its human resource capacity building and takes responsibility in developing them at all levels.

The employment of the Corps of Engineers in peace and war are critical in terms of engineering works. Three types of battalions work under the banner of Corps of Engineers, they are; Division Engineer Battalion, Riverine Engineer Battalion and Engineering Construction Battalion. Among these three, Engineering Construction Battalions (ECB) play a pivotal role in contributing to large-scale nation-building projects. Predominantly, the ECB are organized for the construction and maintenance of roads and temporary airfields. The very nature of their assignment implies continuous engagement in construction work in the form of On Job Training (OJT). Inherently, peacetime employment of ECB in various projects helped to uphold the image of Bangladesh Army and bridging the gap between the military and the civil population. Nonetheless, the present day participations of ECB have surpassed far beyond their capabilities where they are involved in a wide range of subcontracting, consultancy and assistance from foreign experts. Such a wide array of involvement has caused a significant shift in the involvement of ECB from 'Direct Employment' role to 'Supervision and Quality Control' role. As such, the development of the existing capacity of ECB is the necessity of time. Appropriate steps to enhance the capability of ECB will ensure more involvement of troops in construction work along with modern equipment handling.

It is predicted that upcoming projects would be more diverse and critical in nature due to the technology intensity and resource management. These projects will have additional requirements to be met by the implementing authority. The existing workforce and equipment of ECB are not formed and ready to deal with those requirements. As such, it cannot develop all the skills needed for such largescale and critical projects. The ever-growing requirements of infrastructure development can only be met by a rapid improvement in their project implementation skills. Keeping this in view, ECB is now in dire need to expedite their capacity building, or else it will not be possible to contribute directly to nation-building.

In that connection, present and future nation-building projects promise a favourable platform to augment the process of capacity building. At present, ECB are involved in various projects like the construction of canals, flyover, national highway

and so forth. Such diversity and multitude of their employment offer great opportunities for capacity building. Different aspects of capacity building can take place like training, leadership enhancement, team building, and career planning. Officers of the Corps of Engineers may obtain real-time expertise on Design and Architecture, Project Management, Account Management, Contractual Agreements and many more. Apart from the officers, the junior leaders may also develop their skills in Supply Chain Management (SCM), Quality Control and Assurance (QCA), Design Integration and Risk Management and technical skills to operate high-end equipment. Despite all the opportunities offered by nation-building projects, substantial progress in capacity building of ECB could not be made so far due to various challenges.

Objectives

The study focused on the following objectives:

- To analyze the contribution of ECB in nation-building projects with the existing workforce and equipment.
- To analyze the scopes for capacity building of ECB to meet critical requirements of nation-building projects.

Research Questions

This paper undertook the following research questions:

- What is the present state of the contribution of ECB in Nation Building Projects?
- What are the opportunities and prospects of capacity building through Nation Building Projects?
- What are the challenges faced by ECB in capacity building through the implementation of Nation Building Projects?
- How to overcome the challenges of capacity building in the potential areas offered by Nation Building Projects?

The Rationale of the Study

Bangladesh is developing rapidly which offers a large-scale investment opportunity to the world. Due to the rapid change in socio-economic dynamics, all relevant stakeholders of the government are in the competitive track to contribute more for the nation. Bangladesh Army being the role model of a successful contributor to nation-building projects cannot behold in the queue to participate in the influx of development opportunities. As such, it is imperative that military outfits also develop its capacity to contribute to the nation more and generate a diverse human resource as a skilled workforce. In the near future, the number of national development projects will increase, and the Bangladesh Army has to play a significant role to meet the expectation of the nation. More so, members of the ECB will be skilled enough to contribute to the nation-building even after their retirement. Due to the diversity and multitude of projects being implemented by ECB, capacity building through the nation-building projects has a bright prospect in this regard.

Conceptual Framework

The concept which pivots this paper is the contribution of ECB in nation-building projects by enhancing their capacity. At present ECB is engaged in various construction projects with existing workforce and equipment. Future projects along with the ongoing ones will provide the opportunity to enhance their capacity. While fostering their contribution to nation-building projects, ECB needs to overcome few challenges to reap the benefit fully. This overall framework is diagrammatically presented in below figure:

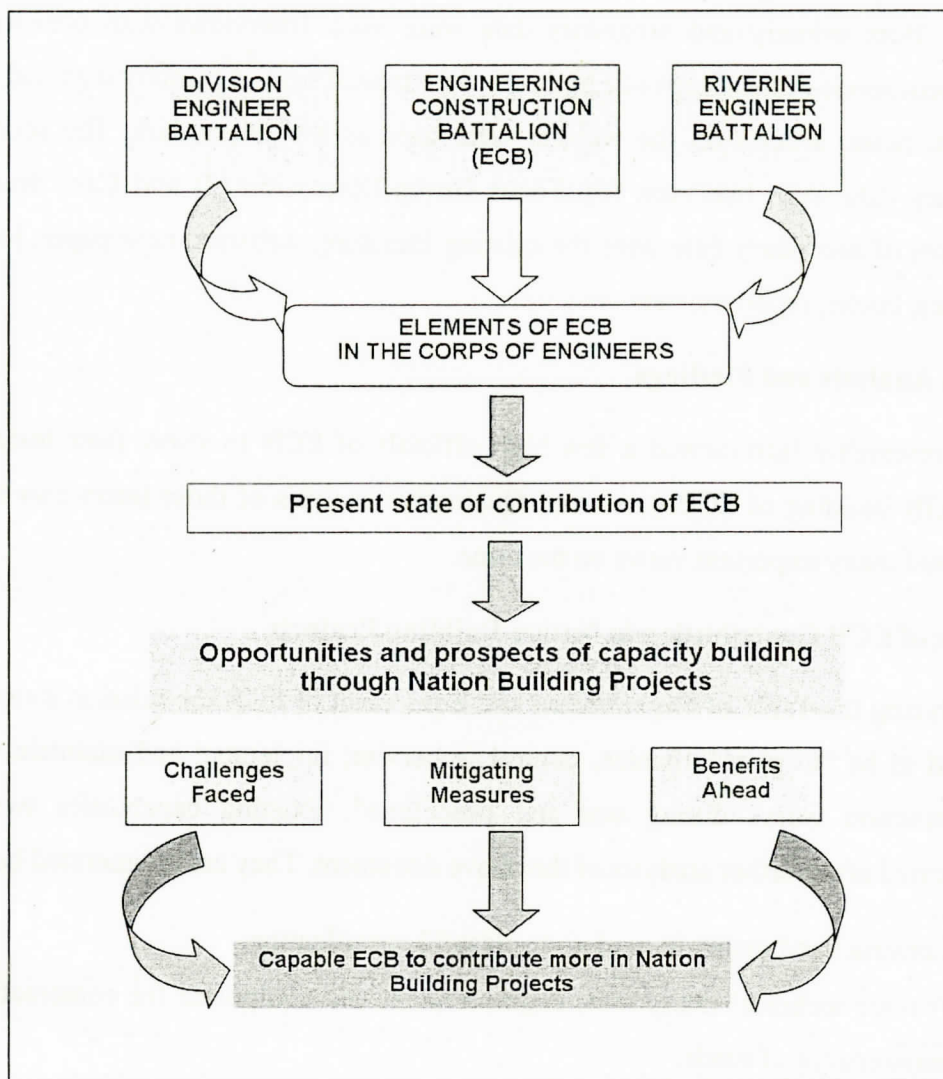


Figure 1: Conceptual Framework

Methodology

In this descriptive research, an effort is taken to evaluate the capacity building of the Corps of Engineers in nation-building projects. In order to substantiate the findings from the literature review, related data from relevant sources were collected. To obtain the objectives of the study, qualitative analysis was applied on the collected data from key informants interview and focus group discussion. The whole study was laid down on the primary source of information.

Both primary and secondary data were used. Interviews with officers from different levels of the Corps of Engineers were treated here as primary data and books, report, news, articles on the website were used as secondary data. The sources of primary data were Interview (5), Focus Group Discussion (2) and Case Study (1). Sources of secondary data were the existing literature, websites, newspaper, journals, articles, books, report etcetera.

Data Analysis and Findings

The researcher interviewed a few high officials of ECB to know their insights on capacity building of ECB personnel. Qualitative analysis of those interviews brought forward many important views on the issue.

State of ECB Contribution in Nation Building Projects

Analyzing the Table of Organization and Equipment of ECB the mission statement is found to be “to plan, organize, control, supervise, implement and maintain various construction works during war and peacetime”. Existing capabilities were also identified after further analysis of the above document. They are enumerated below:

- Construct and maintain road up to class 12 specification.
- Provide technical manpower, engineer plant and equipment for construction and maintenance of roads.
- Construction and repair of temporary airfields.
- Laying concrete and bituminous surface to a limited extent.
- Denial of sea beaches, airfields and roads to the enemy.
- Under special necessity, perform combat engineer tasks as and when instructed by the superior authority.

Present employment of ECB has involved them in implementing a wide variety of megaprojects. One of the Commanding Officers of ECB opined that many of the employments like integrated development and construction of overpasses and flyovers impose requirements beyond their existing capabilities.

ECB personnel remain constantly involved with various projects. The officer in charge of administration opined that their system of Human Resource Development (HRD) is primarily based on OJT. Besides, some training courses are regularly arranged to train the personnel on construction works. As per the official document study, it reveals that the final aim of ECB is to make all ranks physically fit, technically sound and ready to act within the shortest possible time (E in C's Branch 2018). The study also found that career planning in terms of promotion and posting is primarily focused on the combat engineering aspects for which the ECB invariably face a shortage of skilled HR (Reza 2018). As such, it is difficult to cope with the increasing trend in qualifications related to nation-building projects.

At present, ECB are facing rapid growth in the nation-building project implementation due to a number of mega projects like Padma Multipurpose Bridge, Mass Rapid Transit (MRT), few Power Plants and Deep Sea Ports. There was an abrupt increase in the cost of projects undertaken by ECB in the last decade. As an example, the escalation in project costs of 17 ECB (from 2011 to 2017) is shown at Figure-2. At this rate, future projects would exceed the capabilities of ECB and higher requirements will evolve in the construction sector.

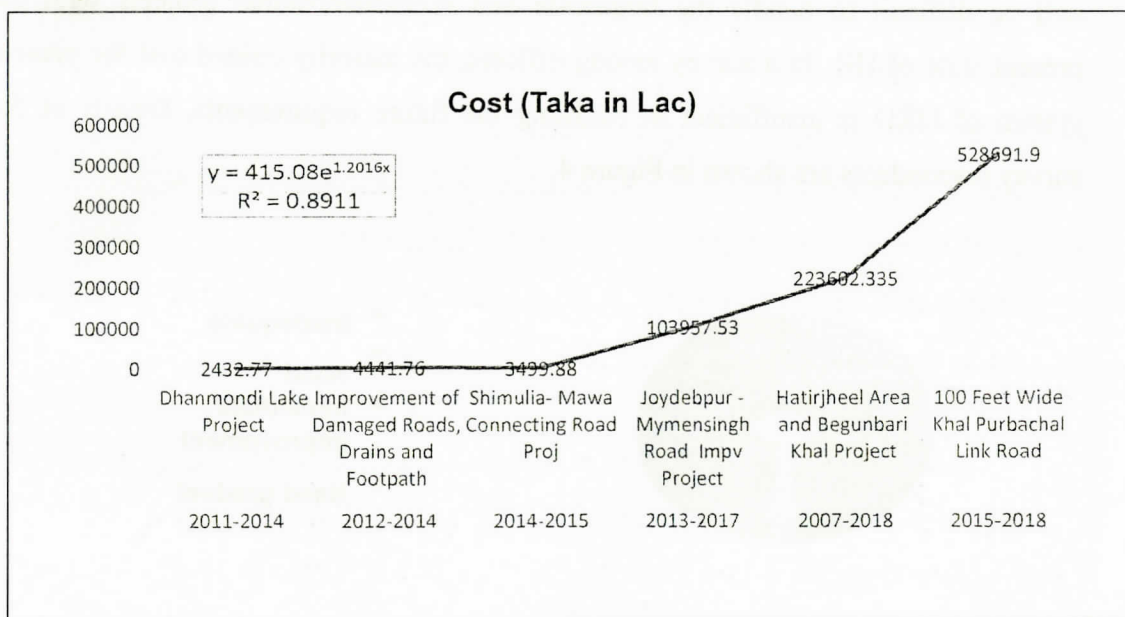


Figure 2: Growth in Project Implementation Cost of 17 ECB

Along with the increased budget, development of infrastructure will be at an intense rate in the next three years to graduate from Least Developed Country (LDC) to Developing Country in 2024. Hence, upcoming projects duration for ECB would be even lesser. Respondents' view in this regard is shown at Figure-3.

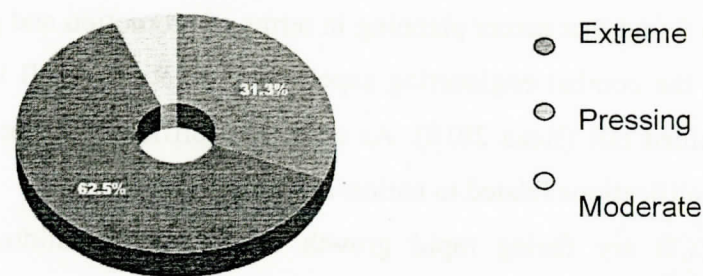


Figure 3: Respondents' View on the Requirement of Speedy Implementation

ECB have been involved in different projects for long and have developed a workable state of HR by now. However, keeping the future requirements in view, it will be difficult to handle the largescale and multidimensional projects with the present state of HR. In a survey among officers, the majority opined that the present system of HRD is insufficient in fulfilling the future requirements. Details of the survey respondents are shown in Figure 4.

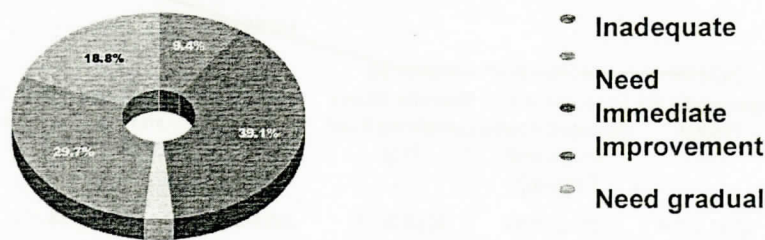


Figure 4: Response showing the Concerns About Present state of HR

The above findings suggest that the existing system of HR needs rapid improvement. Present and future nation-building projects offer exceptional platforms for capacity building of ECB. Through nation-building projects, the construction skills of a unit can be tested and developed. With the continued involvement in nation-building projects, ECB can gradually develop a set of highly skilled HR (Figure 5).

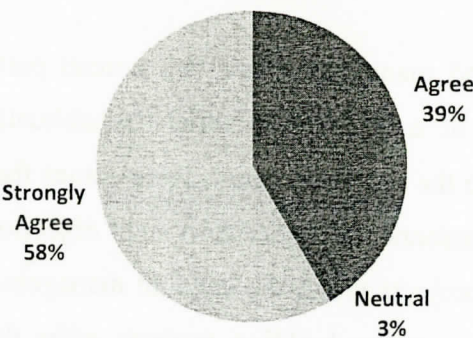


Figure 5: Responders' View on NLP as a Platform for HRD

Opportunities and Prospects

ECB have outsourced experts from BUET for construction of few complicated projects like Marine Drive Road, Hatirjheel Project, and Fly Overs. However, the inclusion of officers in such projects after their completion of BSc in Civil Engineering (CE) or Architecture from MIST will generate a scope of developing Subject Matter Experts within the Army. In this process, ECB can build their capacity in design, architecture and consultancy. Respondents' view in this regard is shown at Figure-6.

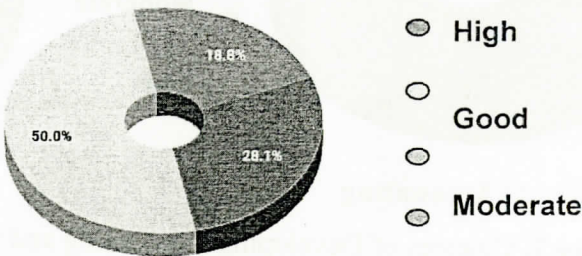


Figure 6: View on Developing Design, Architecture and Consultancy Skills

At present, ECB is involved with the projects right from the beginning that includes acquisition of land. In our country, land acquisition is a colossal process that encompasses delicate dealing with locals and government officials. As such, capacity building with regard to land acquisition, contractual agreement and tendering can enhance the knowledge of legal aspects. Most of the respondents opined in favour of developing legal proficiency.

Project and fund management are two crucial parts of any project. Nation-building projects are of a large fund, which is habitually allocated from sponsor ministry/department to the project account. Here comes the requirement of proficient knowledge by ECB personnel to ensure zero audit objections. Account officer of one of the national level projects views the account management as a prime job for any Project Officer. Hence, nation-building projects offer the opportunity to enhance account handling skills. On the other hand, these projects also provide an opportunity for management of time, manpower, equipment and contractors. It gives a platform for Junior Commissioned Officers (JCOs) and Non-Commissioned Officers (NCOs) to improve their managerial ability in many folds. Figure-7 reflects the respondents' opinion in this regard.

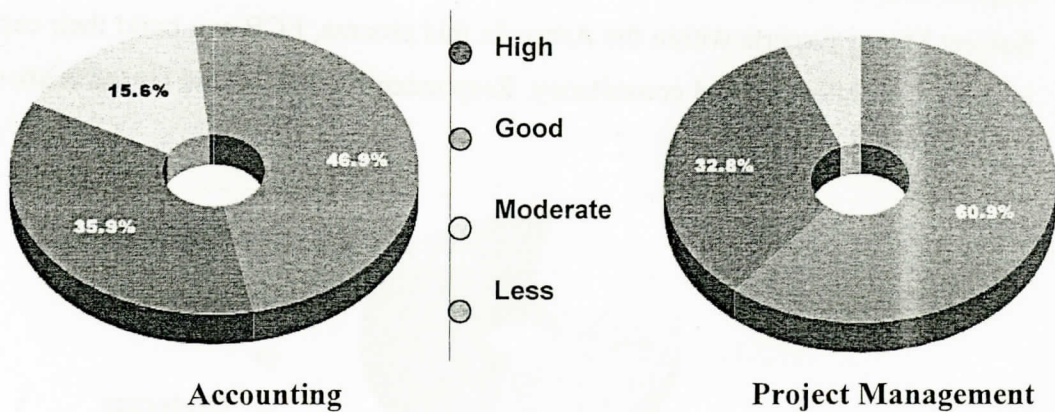


Figure 7: Chances of Developing Accounting and Project Management Skills

Civilian contractors prefer to work in a peaceful environment rather than a wartime scenario. On the contrary, ECB are entrusted with the wartime construction requirements. Thus, nation-building projects will enhance their combat readiness by engaging them in rapid construction in peacetime.

ECB work with the government agencies very closely in nation-building projects. Development of capacity on negotiation, contractual agreement, and land acquisition will help ECB to establish mutual trust with various government and non-government agencies.

Retirement of army personnel at an early age puts them to look for post-retirement jobs. Capacity building by nation-building projects provides a scope of securing the post-retirement solvency for ECB personnel. One of the Senior Warrant Officers of 17 ECB opined that capacity development while working in projects boosts their morale and motivates them to perform better.

Challenges Faced by ECB in Capacity Building

Diverse assignments of ECB over various projects at the same time endanger their capacity building. Commanding Officer of 17 ECB mentioned that apart from various minor projects, 17 ECB is currently involved in nation-building projects like Dhaka-Mawa highway, 100 feet wide artificial canal and landscape development of Hatirjhil. The multiplicity of these projects demands different technical considerations and makes it more difficult to focus on capacity building. The researcher identified the simultaneous involvement of 17 ECB in various nation-building projects facilitated them to handle six projects concurrently. Figure 8 illustrates it more.

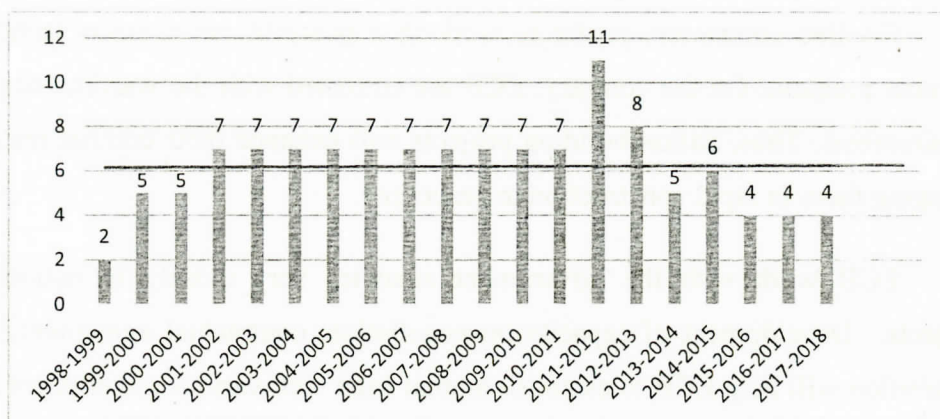


Figure 8: Number of Projects Implemented per Fiscal Year

Involvement of ECB in contemporary projects in different areas divides their equipment and manpower. One FGD was conducted to know their concern over this issue. The findings of that FGD show that majority of the officers consider their workforce to be overstrained. As such, these over-tasked troops gradually lose concentration, inquisitiveness and interest to learn from different project activities.

ECB lack inadequate manpower, especially the officers. About 69.2 % of the respondents replied positively about the shortage of officers in the ECB, while 29.2% of respondents replied negatively. Furthermore, the researcher collected a recent state which shows that, on an average, only 21% of the officers remain posted in the unit (Reza 2018).

As per the present trend, officers are posted to ECB with a considerable time-gap after qualification of their BSc. This long duration affects their engineering proficiency without any real-time exposure to CE works. Majority of the respondents replied positively about the impacts of time-gap before posting to ECB, while very few opined negatively.

Engineer in Chief's Branch opined that ECB are not self-sufficient to implement any nation-building projects without subcontracting (Interview). Their present state of manpower and equipment is not capable enough to handle the increased number of projects. He further added that most of the projects are being implemented by largescale subcontracting where members of ECB only supervise,

manage and pursue the works. As such, it becomes difficult to identify the limitations and needs for capacity building for ECB. About 80 % of the respondents agreed with the facts that present manpower and equipment is not enough to take any project only by ECB, while 20% of respondents did not agree.

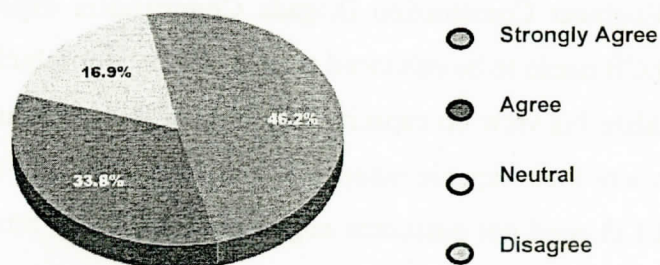


Figure 9: Response of Officers about the Negative Impacts of Outsourcing

Overcoming the Challenges of Capacity Building

Present curriculum for officers does not include Account Management and legal aspects like Contractual Agreement that are very much pertinent to large scale projects. These projects also require careful screening of Development Project Proposal (DPP) or Project Implementation Plan (PIP). However, officers of ECB underperform in these two areas due to lack of knowledge on DPP and PIP. Existing professional curriculum is also inadequate in developing officers' proficiency in Design and Consultancy, Transportation Systems, Traffic Forecast Management, Highway Project Management, and Procurement Management. One of the Commanding Officers of ECB mentioned that due to lack of expert officers in these fields, some of the mentioned expertise is outsourced while most of them are overlooked.

Apart from the officers, JCO and NCO also play a vital role in implementing project works. One of the trainers of JCO and NCO opined that the existing syllabus of basic and advanced trade training does not cover the technical knowledge base required for large scale projects. Junior leaders face a multitude of problems in tackling assigned tasks owing to the absence of required training. According to the

Training Officer of ECB, inadequate technical training is the highly pronounced impediment for capacity building. Inclusion of training on Supply Chain Management, Quality Control and Assurance, Design Integration and Risk Management may further enhance the capacity building for nation-building projects.

One of the Engineer Construction Brigade Commanders expressed that the present capacity of ECB needs to be enhanced to take part in nation-building activities in future. To materialize his view on capacity building, ECB need to undertake large structural projects where their capable manpower and equipment will take part only. On those projects, ECB need not outsource engineering firms for Structural Design and Architecture, Project Management, Account Management, Contractual Agreements and many more if their capacity is developed from now on.

It is also noticed that ECB is capable of doing all necessary base and sub-base works for road/bridge construction. However, due to lack of expertise in design and architecture, ECB cannot take the superstructure part of any bridge construction. It is the field where outsourcing is required more. Study of two Engineer Construction Brigade organogram concludes that existing TO&E does not allow ECB to have this expertise. Interview with the Project Officer of Mawa Road Project under Padma Multi-purpose Bridge also reckons this view. Though ECB is capable of doing necessary piling work with local workers, their lack of expertise in the structural part let them outsource this job. Project Officer also opined with the researcher that ECB can undertake any project if their present capacity is developed by necessary inclusion in their TO&E.

Conclusions

The growing contribution of ECB in the nation-building projects offers an opportunity to think about its capacity building. Engineer Construction Brigades should comprehend the remarkable potentials of nation-building projects with regard to capacity building. Involvement of ECB in large scale projects has opened a wider arena to grow expertise in construction. Traditional project works of ECB does not require additional development of capacity. With the increase of participation in larger projects, the need for capacity building comes to prominence. Hence, ECB should take necessary steps in developing their manpower for taking up nation-building projects at their own, without sub-contracting them to the outsourced companies.

Recommendations

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

- Engineer Construction Brigades may arrange regular 'Executive Development Programs' on Project Management, Geographic Information System (GIS) and Public Procurement Rules (PPR) for officers, JCOs and ORs of the ECB.
- ECB may include practical oriented program related to Project Management which will be useful for junior officers of ECB.
- Engineer Construction Brigades may carry out a study to develop a set of blueprints for further validation under a pilot project.

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