

Role of Military Professionals in Dealing with Construction Industry of Sri Lanka

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Abstract — Construction industry is one of the main industries which contributes to the national economy. This paper is focused to identify the role of military professionals such Civil Engineers, Architects, Quantity Surveyors and Surveyors in dealing with the construction industry in Sri Lanka. This study is purely based on a case study which is in the progress of military construction project in Sri Lanka. Generating information on the civil-military construction environment, contributing the military professionals to the project, increasing the quality and the neatness of the project were considered as the major factors of this project. There were some civil labors and professionals involved in this project. But this study was mainly based on the military professionals and the data collection was done through the primary methods as questionnaires and the interviews. Data analysis was done by using the both qualitative and quantitative techniques. According to the opinions of the experts who are involved in this project, they can achieve the expected results of the time, cost and the quality of the project than the involvement of the civil professionals. Working under the military environment is giving a significant impact on the higher performance of the project than under the civil environment. This case study reveals that there should be a serious involvement of the military professionals in the construction industry. Then the construction projects will be cost effective, timely and high quality with the involvement of the military professionals. Finally, It is strongly recommended to have a proper mechanism to get the involvement of the military professionals to the construction industry of Sri Lanka for its sustainability.

Keywords: Construction Industry, Military Professionals, Sri Lanka

I. INTRODUCTION

The building and construction industry is dynamic, diverse and of critical importance to the country's economy and our way of life. The Sri Lankan construction Industry increased construction projects after the year 2009 because there were no construction projects during the

conflict situation in the North and East provinces (Dharmapala, Thilakarathna and Bandara, 2017). After the culmination of the conflict, government and private sector (local and foreign) attention was focused towards investing in mega projects such as high-rise buildings, airport, harbour, roads, highways, towers, port city. Further, the current government has a development plan for the country's future. This situation affects the Sri Lankan construction industry and it will be a valuable opportunity as well as a great challenge. Among all the challenges, lack of human capital is the biggest challenge (Silva, 2018).

There is an extra demand in the construction industry job category, such as craft, basic occupations, machinery operators and assemblers. Furthermore, this indicates there is a vast skilled labour shortage in the Sri Lankan construction industry (Basnayake and Premathilaka, 2015). To meet these targets the industry cannot rely on recruiting only from the traditional workforce. Indeed, it is said that the fact that major obstacles are being hacked to recruit the best people is largely ignored (Green, 2005).

In order to identify the need for different training and development activities for military-men in the construction industry, an exploration of factors that lead to the success of their careers is vital. Therefore, this paper details which career success factors have enabled professional military-men in the Sri Lankan construction industry to get their career advancement.

II. LITERATURE REVIEW

The construction industry plays an important role in the national economy. It also plays an important role in the direct and indirect growth of the country's GDP. It generates tax revenues for direct investment, income, large investments from local and international sources and good for the country's economy.

A. *How will military professionals contribute to improving the construction process in Sri Lanka?*

This research selected an on-going project and have done a case study and the results obtain are being analyzed both quantitative and qualitative methods. There are Army, Navy, Air Force and Construction Support Teams. Fifty military professionals from Army, Navy and Air Force were selected for this research. As per the feedback received given from these professionals, it was mentioned that criteria such as value for money, professionalism and quality, trust, flexible attitude, builing local capacity, process transparency and force protection and local participation.can be fulfilled by themselves as well as the civil professionals. Criteria such as

As to whether the military force is responsible for construction and reconstruction in a conflict scenario is debated. In this research an assumption was made that the military force is responsible in facilitating the other instruments of national power i.e. Diplomatic, Informational, Military, and Economic (DIME). The military construction professionals will, therefore, continue to play a crucial role in mitigating the gap between the tactical and the strategic level and the military and the civil actors in the future operation environment.

The military engineering discipline that is focused on affecting terrain while not in close support to maneuver forces. Tasks that are most frequently performed under general engineering conditions include the construction, repair, maintenance, and operation of infrastructure, facilities, Lines of Communications (LOC), and bases, protection of natural and cultural resources, terrain modification and repair, selected explosive hazard activities, and environmental activities. These are the primary focus for general engineer units.

B. Construction workforce in sri lankan construction industry

With respect to the construction workforce, it has been found that a significant portion of them is casually employed and have had no proper training in any trades (Jayawardane, 1998). A survey on 3300 construction workers and 56 direct construction related agencies by Jayawardane et al (1998) revealed that the workforce consisted of 51% unskilled workers, 33% masons, 10% carpenters and 1-2% each of plumbers and electricians.

Professionals employed in the military are and the required skills and practices are being given to them. This training improves their working capacity and mainly focusese on the productivity and saving of government resources.

C. Impact on plants and materials

While the Sri Lankan construction industry is primarily a labour-intensive sector, trends in plant utilisation have

emerged in road, telecommunication water supply and sanitation projects. The availability of plant and machinery has marginally improved. Contractors have moved away from labour-intensive construction methods to the use of capital-intensive operations such as the use of prefabrication systems, and ready-mixed concrete in high-rise buildings. This trend has been prompted by the demand for private housing as well as commercial and industrial buildings. The marginal increase has been mainly due to contractors finding it difficult to invest in such equipment due to the devaluation of the local currency against the US dollar, and high interest rates in Sri Lanka (ICTAD, 1997).

D. Productivity of Military professionals

Productivity improvement in the construction industry is a deliberate process to improve the capacity and effectiveness of the industry to meet the demand for building and civil engineering products, and to support sustained national economic and social development objectives. However, building construction industry in Sri Lanka, these difficulties and challenges are present alongside a general situation of socio-economic stress, chronic resource shortages, institutional weaknesses and a general inability to deal with key issues in human resources. There is also evidence that the problems have become greater in extent and severity in recent years.

When it comes to the militaries, they are tends to deal with the job in a different manner than the others which will received from their initial training in respective training school so that will become a key factor on which supporting to mitigate the strength and withstand the stress factor in an efficient way and that will enrich to improve a construction productivity at this scenario.

In order to full fill the identified problem the objectives which were formulated as to identify the role of military professionals such Civil Engineers, Architects, Quantity Surveyors and Surveyors in dealing with the construction industry in Sri Lanka, To identify need of different training and development activities for professional militiamen's in the construction industry, To discover factors which are helped for professional militiamen in the Sri Lankan construction industry to get their career advancement.

III.METHODOLOGY

Primary data collection was primarily used for data collection. A questionnaire was developed for professionals in Sri Lanka who are involved in construction activities. Several questionnaire were conducted to confirm the data obtained from the questionnaire. There, data triangulation has been used. Hampson et al (2014) mentioned that questionaries and interviews are recommended to study for the actual issues in the

industries and the findings can be construed from the actual experience and views.

These questions are based on research problems, research objectives and related literature. The research included construction professionals ranging from staff to a high management level in both military and civil field. Using simple random sampling systems to distribute the questionnaire, 50 professionals from the construction industry were selected. Conduct interviews with 5 professionals with clear knowledge in this area. Generally, professionals cover Civil Engineering, Surveying, Quantity Surveying and Architecture from military professionals also.

As per the results, the collected data was analyzed. Bhangale(2013) mentioned that the above methods are prominent for quantitative analysis. The questions were formed based on the main objectives 20 questions were developed for that.

Scale type questions developed for addressing the variables based on the following five points scale, 05 = Strongly Agree, 04=Agree, 03=Disagree, 02 =Strongly Disagree, , 01=Neutral. The limitation in the application of military professionals priorities are shortened under the following categories.

Table 1: The priorities of the questionnaire for Average Frequency Analysis

Average Index	Priorities of the issues
0.00 < Average Index 1.00	Strongly Disagree
1.00 < Average Index 2.00	Disagree
2.00 < Average Index 3.00	Neutral
3.00 < Average Index 4.00	Agree
4.00 < Average Index 5.00	Strongly agree

Source:

The relative index used to rank and priorities the questionnaire. This is calculated by the following formula,
 Relative index = $\frac{\sum 1 X1+2 X2+3 X3+4 X4+5 X5}{5 \sum X1+X2+X3+X4+X5}$

The following table is the brief discussion of the responses for the questions which were prepared based on objectives and further the results ranked based on the relative index and used to identify the immediate action to be taken for the application of research and development in construction.

IV. RESULTS AND DISCUSSION

Table 2: Roles of the Architect in the Sri Lankan construction industry

	SA	A	N	DA	SD	Rel Index	Rank
1. Nowadays construction industry is more effective with the professionals in military field.	21	09	08	08	04	0.33	20
2. Military involvement in the construction industries of developing countries and development of the construction industries.	18	08	12	10	02	0.36	15
3. Prioritization of construction projects within the military chain of command and the military department.	16	09	10	09	06	0.34	19
4. With the involvement of military field, it can reduce the future labour shortage in construction industry.	18	11	13	04	04	0.37	12
5. Military construction professionals contribute to the defeat of the future threats in industry	19	12	09	06	04	0.37	12
6. Easy to obtaining of materials and plants will be easier gain from government properties.	18	12	07	08	05	0.36	15
7. Military construction professionals will be crucial when developing the civil-military relationship in the construction industry.	18	11	08	09	04	0.36	15
8. Establish a qualitative pace it is essential to mitigate the gap, or erase the border between military and non-military actors in construction field.	22	14	08	04	02	0.40	7

9. Military construction project need an authorization and a separate appropriation for each construction project.	17	16	11	05	01	0.39	10
10. Increasing the quality of the construction project, when involvement of military side.	21	16	08	03	02	0.41	5
11. Productivity of Military professionals are higher than that of civil professionals.	18	17	11	03	01	0.40	7
12. Since SL is a developing country and it should maximize the amount of resources which can being used from military.	19	15	8	07	02	0.39	10
13. Lack of resources and technology affect to the present market with the other competitors.	12	15	16	05	02	0.36	15
14. The experience of military professionals is enough to involve for the complex projects such as civil professionals	24	16	07	02	01	0.42	4
15. Experience of the military professionals will be based on decision making.	21	17	08	03	01	0.41	5
16. More preciously health and safety are been adapted by military professionals rather than others	15	17	10	05	03	0.37	12
17. Neatness, trustworthiness is higher than in military professionalism.	23	21	04	01	01	0.43	1
18. Effectiveness is the working	24	21	03	01	01	0.43	1

capacity of the military workers is higher.							
19. Ability to handle large number of project at same time.	20	17	08	03	02	0.40	7
20. Scheduling of work is on time.	26	15	07	01	01	0.43	1

Source:

In our research we are tried to identify factors which are related to the construction industry with military professionals in Sri Lanka. Out of our questionnaire we tried to express the important of involving military professionals for construction industry. This research questionnaire had 20 questions.

According to the results of the questionnaire, out of our sample in 50 professionals in industry were delivered progressive answers for that.

A. Architect

Table 1 identified the various roles of an Architect among the Military professionals in the construction industry and the ranking of the factors through the use of Relative Significance Index (RSI).

	S	A	N	D	S	Rel	Ra
	A			A	D	Ind.	n.
					A		
1. Preparing application for planning and building control	3	6	3	6	32	0.832	3
2. Producing detailed working drawing and specification	0	1	0	1	34	0.928	1
3. Cost analysis and land-use study	4	30	10	3	3	0.484	5
4. Turning the client brief into drawing	0	1	1	1	33	0.920	2
5. Final construction plans	1	2	10	2	15	0.792	4

Source:

The survey revealed that Producing detailed working drawing and specification ranked first with RSI value of 0.928 among the roles of the architects in the Sri Lankan construction industry. Turning the client brief into drawing ranked second with RSI value of 0.920. Preparing application for planning and building control ranked third with RSI value of 0.832. These are followed by Final

construction plans (0.792), and Cost analysis and land-use study (0.484). The result also showed that all the roles are significant with the least role having 48.4 (0.484) percent significance.

B. Engineers

Table 2 identified the various roles of an Engineer among the professionals in the construction industry and the ranking of the factors through the use of Relative Significance Index (RSI)

	S A	A	N	D A	S D A	Rel Ind.	Ran.
1. Calculation of load and stresses the construction will safely withstand	0	0	1	3	46	0.980	1
2. Factorizing the qualities and strength of building materials	0	3	0	24	23	0.868	4
3. Incorporating structural members and foundation	0	7	3	15	25	0.832	5
4. Determining the suitability of the earth for construction	0	3	17	11	19	0.784	6
5. Organization and delivery of materials and equipment for construction	1	21	10	3	15	0.641	7
6. Management and supervision of on-site labour	3	16	12	6	13	0.640	8
7. Installing and maintain mechanical machinery, tool and component in a building	0	1	1	1	47	0.976	2
8. Installing and maintaining electrical control system	0	3	0	10	37	0.924	3

Table 2: Roles of the Engineers in the Sri Lankan construction industry

The roles of engineers in the Sri Lankan construction industry revealed that Calculation of load and stresses the construction will safely withstand ranked first with RSI value of 0.980, Installing and maintain mechanical machinery, tool and component in a building ranked second with RSI value of 0.976, and Installing and maintaining electrical control system ranked third with RSI value of 0.924. These are followed by Factorizing the qualities and strength of building materials (0.868), Incorporating structural members and foundation (0.832), Determining the suitability of the earth for construction (0.784), Organization and delivery of materials and equipment for construction (0.641), and Management and supervision of on-site labour (0.640). The result also showed that all the roles are significant with the least role having 64.0 (0.640) percent significance.

Surveyors

Table 3 identified the various roles of land surveyors among the professionals in the construction industry and the ranking of the factors through the use of Relative Significance Index (RSI).

	S A	A	N	D A	S D A	Rel Ind.	Ran.
1. Building location survey	0	0	1	7	42	0.964	1
2. Foundation location	3	10	10	13	14	0.700	3
3. Preparing construction layout	1	18	5	8	16	0.656	4
4. Providing proposed site plan	1	11	13	7	18	0.720	2

Table 3: Roles of the Surveyors in the Sri Lankan construction industry

The roles of land surveyors in the Sri Lankan construction industry and revealed that Building location survey ranked first with RSI value of 0.964. Providing proposed site plan ranked second with RSI value of 0.720, Foundation location ranked third with RSI value of 0.700, and preparing construction layout ranked fourth with RSI value of 0.656. The result also showed that all the roles are significant with the least role having 65.6 (0.656) percent significance.

1) **Quantity Surveyors**

Table 4 identified the various roles of quantity surveyors among the professionals in the construction industry and the ranking of the factors through the use of Relative Significance Index (RSI).

	S A	A	N	D A	S D A	Rel Ind.	Ran.
1. Preparing bill of quantity	0	0	0	2	48	0.992	1
2. Schedule of materials of building of project	1	7	4	19	19	0.792	4
3. Estimate cost relating to construction materials, time and labour and cost adviser	0	1	0	11	38	0.944	2
4. Variation of work in progress and materials on site for interim payment	0	1	7	15	27	0.872	3
5. Cash flow payment	3	11	5	13	18	0.728	5

Table 4: Roles of the Quantity Surveyors in the Sri Lankan construction industry

The roles of quantity surveyors in the Sri Lankan construction industry revealed that Preparing bill of quantity ranked first with RSI value of 0.992. Estimate cost relating to construction materials, time and labour and cost adviser ranked second with RSI value of 0.944, Variation of work in progress and materials on site for interim payment ranked third with RSI value of 0.872, Schedule of materials of building of project ranked fourth with RSI value of 0.792, and Cash flow payment ranked fifth with RSI value of 0.728. The result also showed that all the roles are significant with the least role having 72.8 (0.728) percent significance.

V. CONCLUSION AND RECOMMENDATIONS

The development of the Sri Lankan construction industry has closely followed the economic changes during the past decade. According to the research findings, the involvement of Military Professionals in construction industry is important to the future of construction industry in Sri Lanka. So it would be the better if Sri Lankan construction industry, concern about the military involvement for the construction projects. As a result, civil professional participation in construction industry

expected to dominate the industry with the involvement of expatriate contractors as service providers rather than traditional contractors.

A successful project is very much depending on the construction professionals to act as an effective manager. They should act as a generalist and a facilitator when coordinating projects. Normally military personals are good at handling mediation, managing conflicts and negotiating terms with various other parties in the projects and so on. In fact, there are many kinds of relationships in construction projects. The milestone and pressure on the construction project is higher than the other industries. That way the relationship between them is needed to be clarify based on duties and responsibilities to achieve the objective of projects. The requirement for the professional in construction project becomes increasingly popular so governments requirement becomes success when this spot is being occupied by military personnel. The professionals in the construction industry have to provide their service to the client with accordance to the professional code of conduct to ensure that negligence not occurred in the consultant services. In handling disciplinary case that involve professionals of construction projects several legal guide lines to be obey by the party that handle disciplinary matters. Military professionals are under the two law they maintain high dignity and responsibleness for their profession which keen to full fill the requirements of a professional in construction industry.

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