

Challenges faced by the construction industry in Sri Lanka: perspective of clients and contractors

Nayanthara De Silva

Department of Building Economics, University of Moratuwa

(email: endds@becon.mrt.ac.lk)

R. W. D. W. C. A. B. Rajakaruna

Department of Building Economics, University of Moratuwa

(email: aselaraja@yahoo.com)

K. A. T. N. Bandara

Department of Building Economics, University of Moratuwa

(email: tikiriniroshangs@yahoo.com)

Abstract

The construction industry is a major contributor to the development of economies in Sri Lanka. However, it faces significant challenges and difficulties which are unique to the specific industry. Therefore, it is a vital role to recognise them and offer solutions. This paper presents findings of a research which was carried out to identify challenges face by the Sri Lankan construction industry and effective mechanisms / motives to overcome such aspects from the consultants' and contractors' perspectives. An industry-wide questionnaire survey was carried out to observe the views of professionals in the building construction industry during June-July 2005. Forty six critical challenges which need immediate attention were identified. Further, 20 mechanisms and motivators were tested to explore solutions in overcoming the above challenges to enhance the image of the construction industry. Thirteen mechanisms were identified and five effective factors were extracted and recommended for up-lifting the image of the construction industry.

Keywords: Construction industry, Challengers, Sri Lanka, Developing countries

1. Introduction

It has been documented that the construction industry is being faced many problems and challenges. In developing countries, these problems are compounded alongside a general situation of socio-economic stress, chronic resource shortages, institutional weaknesses and a general inability to deal with the key issues by inadequate investment plans and changing government priorities due to various sociological, economic and political constraints [1-3]. Some studies evidenced that these problems have become greater in extent and severe in recent years in many countries [4-5]. In Sri Lanka, the fluctuating construction workload, unfair competition by foreign contractors, skills drain and shortages and high cost of developing skills were the main identified problems [6].

However, in Sri Lanka, the construction industry places a vital role in economical and physical development. Further in Sri Lankan economy, construction is the fourth highest sector after services, manufacturing and agriculture [7]. Therefore it is important to consider the present context of the industry to identify precincts and to get counteractive measures in order to uplift the industry to meet the future challenges. This research has focused to identify critical challengers which need immediate attention and effective mechanisms for development of the construction industry in Sri Lanka.

2. Research Design

Research was designed to identify its objectives through an industry-wide questionnaire survey. Since consultants, contractors, suppliers and specialist contactors are the main parties dominating the construction industry, it was decided to elicit their knowledge as experts views to explore the research objectives. However, due to the limited time and other several constrains, suppliers and specialist contracts were omitted. The vacuum in the knowledge extraction due to omission of suppliers and specialist contracts from the survey was minimised by selecting experts from large consultant and contractor organizations (eg. Grade 1 to Grade 2), which handle a wide variety of construction activities.

2.1 Sample Selection

The survey sample was selected randomly (using simple sampling methods). The contact list of leading consultants (Architects, Engineers and Quantity Surveyors) was obtained from the yellow pages of the telephone directory and from respective professional institutions. Contractors were selected from the Institute for Construction Training and Development (ICTAD) registered contracting organisations under Grade 1 to Grade 2, either from the field of building construction works or civil engineering construction works. The sample size for each group was selected as 40.

2.2 Questionnaire Design and Questionnaire Survey

The questionnaire was developed into three sections. Several important questions were grouped under section one to identify the profile of the respondent. Section two was focused to identify challenges and problems of the construction industry. In this section 61 existing challenges and problems obtained from the literature were shown under 10 areas including, financial, government policies /practices, technology, management and coordination, research and development (R&D), resources, safety, training and development, social, and skills [4, 8-16]. In the third section, 20 motivators to improve the image of the industry were listed. A seven-point “likert” scale where 1 represented “very critical” or “very effective”, 4 indicated “neutral”, and 7 stood for “not critical at all” or “not effective at all” was used in the sections 2 and 3 to solicit the judgment of respondents regarding the criticality, effectiveness and efficiency of the proposed (listed) industry challengers, and motivators.

The questionnaire survey was started from a pilot survey which was carried out to ensure the reliability of the survey. Three experts were involved in this task and their feedbacks were used to fine-tune the format of the questionnaire. The improved version of the questionnaires was distributed among the selected group. Hand delivery was used to deliver and collect the questionnaires to increase the rate of return.

3. Discussion

T-test was used as a tool to identify the significant challengers, and motivators. Evaluation was carried out by using “Statistical Package for Social Science” (SPSS) software. To test the null hypothesis $H_0: \mu = \mu_0$ against the alternative hypothesis $H_1: \mu < \mu_0$, where μ_0 is the population mean. μ_0 is the critical rating above which the issue was considered agreeable or ineffective. In this analysis, μ_0 was fixed at 4 because, by definition, given in the rating scale, 4 is neutral.

Further, factor analysis was carried out to understand how the significant challengers and motivators work together. Here, the most effective and leading factors that could change the current practices in the industry to achieve a good image can be established using factor analysis (FA). In this analysis, the important factors were established from those whose Eigenvalues are greater than or equal to 1, since an Eigenvalue is a measure of how a standard variable contributes to the principal components. A component with an Eigenvalue of less than 1 is considered as less important and can therefore be ignored and omitted [17].

3.1 Critical Industry Challengers

Forty six significant challengers identified through the t-test are listed in the Table 1. They are grouped under ten different areas including financial, government policies, technology, management and coordination, R&D, resource, safety, training and development social and skill levels.

Table 1 - Significant Challengers

No	Challenge	Mean	Sd.	T	Sig.
A.	Financial				
01	Rapid changes in the national economy	5.05	0.91	7.59	0.000
02	Inadequate support from banking sector	4.84	0.96	5.79	0.000
03	High inflation rate	4.82	0.99	5.46	0.000
04	Narrow profit margins	4.82	1.04	5.22	0.000
05	High interest rates	4.77	1.12	4.59	0.000
06	Limited credit facilities	4.39	1.17	2.20	0.033
B.	Government Policies / Practices				
07	Government policies on taxes	5.09	1.18	6.15	0.000
08	Political instability	4.84	1.2	4.65	0.000
09	Low level of government support on construction	4.89	1.33	4.41	0.000

No	Challenge	Mean	Sd.	T	Sig.
10	Bribe/corruption and favourism	4.59	1.09	3.61	0.001
C.	Technology				
11	Low level of new technological development	5.02	1.09	6.23	0.000
12	Inadequate technological knowledge	4.68	0.80	5.65	0.000
13	Low level of technology transfer	4.61	1.13	3.62	0.001
14	Low level of usage of IT	4.41	0.97	2.79	0.008
D.	Management and Coordination				
15	Poor cost planning	4.8	0.88	6.01	0.000
16	Poor documentation process	4.64	1.10	3.83	0.000
17	Extensive time slippage in contracts	4.55	1.00	3.62	0.001
18	Poor communication	4.55	1.04	3.46	0.001
19	Lack of progress monitoring	4.41	0.97	2.79	0.008
20	Low level of administrative flexibility	3.66	1.01	2.24	0.03
F.	Research and Development				
21	Government involvement in R&D	5.02	1.13	6.00	0.000
22	Limited allocation of funds for R&D	4.91	1.03	5.85	0.000
23	Lack of opportunities for R&D	4.86	1.03	5.59	0.000
24	Reluctant in using innovative building materials	4.68	1.12	4.05	0.000
25	Low level of participation of institutes in industrial oriented R&D	4.7	1.30	3.58	0.001
G.	Resource				
26	High labour turnover	4.73	0.87	5.53	0.000
27	Insufficient integration on design and built operation	4.89	1.13	5.23	0.000
28	Lack of high technical construction equipment	4.8	1.05	5.04	0.000
H.	Safety				
29	Inadequate safety precautions	4.86	0.82	6.95	0.000
30	Undefined specification of construction safety	4.86	0.85	6.73	0.000
31	Improper implementation of safety rules	4.7	0.79	5.88	0.000
32	Limited funds for safety precautions	4.59	0.76	5.18	0.000
33	Low level of employment of safety officers	4.77	1.01	5.08	0.000
34	Limited knowledge on safety precautions	4.59	1.15	3.42	0.001
I.	Training and Development				
35	Limited allocation of funds for employee trainings	4.93	0.87	7.08	0.000
36	Inadequate carrier development programmes	4.93	0.95	6.51	0.000
37	Inadequate support from Institutional organisations	4.66	1.08	4.06	0.000
38	Currently practicing government grading systems	4.27	1.11	1.63	0.110
J.	Social				
39	Inadequate health on construction sites	4.41	0.87	3.12	0.003
40	Low level of facilities provided for workers	4.3	0.73	2.67	0.011
41	High environmental impact	4.34	1.03	2.19	0.034
K.	Skill				
42	Inadequate skill development programmes	4.86	1.03	5.59	0.000

No	Challenge	Mean	Sd.	T	Sig.
43	Availability of professionals	4.73	0.92	5.22	0.000
44	Low level of skilled workers	4.7	0.90	5.17	0.000
45	Skills of fresh graduates joint in the field	4.84	1.10	5.08	0.000
46	Scarcity of skills availability in the construction	4.59	0.95	4.14	0.000

Financial – Six financial challengers were shown as significant. Financial health of clients and contractors is very important for the success a project. However, respondents felt that it can deteriorate due to other external factors such as rapid changes in the national economy which is a most critical challenge observed from the t-test, followed by inadequate support from the banking sector, high inflation rate, narrow profit margins, high interest rates, and limited credit facilities.

The construction industry has always had a close relationship with the banking system since the money transferring is enormous. However, in Sri Lanka, most of the bankers behave only as money lenders in extending financial facilities. Further, obtaining of a loan from a bank is a tedious procedure which, in some cases, takes months. This longer time period discourages the contractor who requires short term bridging finance. Respondents felt that the higher interest rates of the lending institutions too have made national practitioners not competitive with foreign counterparts who are able to get loans from their bankers with undercutting rates of interest. Further, many contractors do not have reasonable access to commercial borrowings and other facilities at reasonable and comparable rates as available in the developed countries. The lack of credit facilities is another constraint. Short term financing sometimes is available to construction enterprises from local banks, and is expensive. Most enterprises, therefore, operate without access to credit facilities.

Government Policies – It is identified that the construction industry has been experiencing lot of difficulties due to the lack of government policies or ineffective policies to support the construction industry. For instance, government tender procedures based on low price-based are sometimes shown very inefficient [18]. According to respondents, tax policies are another one of main concerns. Political instability of the country created rapid changes of certain policy decisions taken by the previous governments. For instance, decisions to awarding of contracts were revised in many instances. Therefore, the political instability of the government can affect the construction industry and its productivity. Therefore, the government of Sri Lanka should consider that there is a need for clear and effective policies for the construction sector. These policies should be developed by identifying objectives of national construction priorities and for providing guidance for the mobilization of investment. Further, such policies are able to provide a framework for enabling and facilitating the development of the domestic construction sector through professional development, business enterprise and productivity enhancement. However, corruption and favourism is one of the main drawbacks created with the open economic policies in many countries.

Technology – Historically, Sri Lanka has developed largely a craft based construction technology, emanating from the experience gathered over 2000 years. This level of technology was sufficient to meet the construction needs even in the post-independence era. However the large scale rapid development projects such as irrigation, power and industrial building construction work that were launched in the fifties; demanded a high level of technology input. The local industry was not fully geared to meet the entirety of this increased technological demand as such; some of the large scale construction projects were carried out by foreign contractors due to lack of technological development, knowledge and transfer. For example, during the phase of the “accelerated Mahaweli development programme”, in late 70’s, the foreign contractors had dominated the industry. Further, a conscious effort does not appear to have been made to ensure a sufficient degree of local participation and technology transfer. However, during the last decade, it appears that a fair degree of technology transfer was achieved with a fairly well equipped technology and management base. But, still there is a lot more to achieve. Making use of IT in the construction industry is still at its adolescence stage though the IT industry is booming very fast. This was identified as one barrier for its development.

Management and Co-ordination – Management and co-ordination of projects are shown as great difficulties in the construction industry. In this survey, cost planning, documentation management, time management, communication, progress monitoring, administrative issues were shown in high profile. The cost planning plays a significant role in ensuring that company objectives are compatible with its resources. Poor cost planning of both parties due to lack of proper budgeting results in poor quality of work. For instance, for a contractor to use his mobilisation advance payment to purchase equipment which he cannot depreciate entirely on the particular job or even for other purposes outside the contract, leaving little or nothing to finance the work. A proper documentation process which can be transparent to all parties in the process is another important fact yet not practised in many construction projects. Further, proper time management and progress monitoring strategies are yet to develop to make sure of its delivery on time.

Research and Development – Lack of initiatives, funds, opportunities and attitudes were identified as major issues for inculcating R&D culture in the construction industry. It was identified that most of the firms were reluctant to carry out R&D programs. This may be due to the fact that benefits are not quick and straightforward. Further, most of the practitioners believed that the government should encourage more on R&D as the construction industry plays a major role in the economy. Research projects conducted in universities can be more focused on industrial needs, rather than basic researches. Also, staff members who are carrying out these projects should be encouraged and recognised within the university system. Research forums and awareness programmes can be organised by training institutes for researchers highlighting the research areas to be needed, and providing various sources of funding for these researches.

Resource – Lack of labour, equipment, knowledge and integration are observed in this survey. Today, many construction workers are hired on a project basis and made redundant on project completion. This is a common fact to most of developing countries [8]. As a result, the

construction industry is characterized by a pool of labours who works for a variety of contractors in different types of construction. Lack of integration on D&B operations for improving the industry performance is another main challenge. This may be due to lack of experience and knowledge. However, knowledge can be improved by getting various exposures from different projects carried out specially by foreign firms to a certain level.

Safety – The extent of construction accidents is more severe when compared to other industries [19-20]. From the survey results, inadequate safety precautions, lack of implementation of rules, limited fund; knowledge and qualified officers were identified for the extent of unexpected accidents and social problems in the construction industry. Further, the annual report published in 2002 by ICTAD also highlighted that the safety practices that are being adopted at construction sites are far below acceptable standards. On the other hand, low educational levels of many construction workers may be one of a main barriers to imply the safety at sites. Most of the workers do not understand the importance of the site safety rules for their health and safety.

Training and Development – Training and development was highlighted as another significant issue among other concerns. Limited allocation of funds for employee training is one of major barriers of many organisations. On the other hand, the existing situation of many organisations is rather depressing for the employees, due to the reluctance in allocating funds for training and development. At the moment with the government involvement National Apprentice and Industrial Training Authority (NAITA), ICTAD, and a few other technical training institutes are conducting training and developing programs. But this support is not enough to satisfy the demand. In this regard, technical institutes, universities, etc., can take, as part of its responsibility to win the challenge.

Social – There are many social factors being neglected at the site level. They are highlighted in the survey as poor health, hygienic and welfare facilities for the workers. On the other hand, low educational level and attitudes of many workers may be responsible for the poor performance of health and hygiene at the site. This is another area that researchers should focus on finding mechanism to improve the existing conditions. Due to Low profit margins of contactors often intend to complete the projects with minimum supply of facilities to their workers. This may sometimes result even unacceptable hygienic conditions within the site.

Skill – The construction industry suffers from inadequate supply of professionals, less skill levels of fresh graduates and skilled labour force. High demand for the professionals in many countries and low level of salary schemes in the local industry may reduce the number of professionals retained in the local construction industry. This problem is not confined to the local industry, but is a common fact in many developing countries [1]. Less skill levels of fresh graduates may be due to inadequacy of the industry oriented training obtained during the degree programme. Further, it was revealed that less than 4% of the workers in Sri Lanka have been systematically trained and carry certificates that are indicative of their skill [21]. Lower skilled workers may be due to several reasons such as lack of training opportunities provided by the

organisations and lack of comprehensive training courses, skill development short courses and individuals less interest on attending such courses.

3.1 Industry Motivators

Out of 20 motivators shown in the questionnaire, 13 were shown as significant and they were further grouped using factor analysis to explore further relationships. Factor analysis was carried out to ascertain if there is any further relationship among the motivators to help the construction industry enhance its image. By using the principal component analysis as the extraction method, four factors with Eigenvalue greater than 1 were extracted (Table 2). The Eigenvalue corresponding to the each factor is shown below to the factor number in the Table 2. The Table 2 also shows the rotated factor loadings. A factor loading can be expressed as a correlation coefficient between an original variable and an extracted factor. To increase the factor loadings which indicates which variables were highly related to each factor, factor rotation was carried out with “varimax” rotation.

Table 2- Industry motivation factors

Motivators	Factor 1(2.33)	Factor 2(2.22)	Factor 3(1.87)	Factor 4(1.56)	Factor 5(1.01)
Enhancing R&D	0.90				
Increase skill levels of employees	0.82				
Promote joint-ventures with foreign construction companies	0.64				
Construction safety practice		0.84			
Offering incentives for encouragement of employees		0.87			
Institute involvement in training and development		0.51			
Opportunities for career development programmes			0.80		
Increase buildability practices			0.73		
Maintain the construction quality standards			0.66		
Improve the professional standards				0.74	
Enhancing the relationship between construction companies				0.73	
Offer knowledge on industry at the primary education system				0.61	
Introduction of new forms of procurement systems					0.90

These five factors are as follows,

Factor 1: enhancing skills and efficiency

Factor 2: adopting incentive awarding mechanism

Factor 3: imposing quality practices

Factor 4: improving professionalism

Factor 5: improving procurement strategies

Enhancing Skills and Efficiency – Enhancing skills and efficiency was identified as the first factor. Respondents felt that the enhancing skills and efficiency in many ways could improve the image of the construction industry. It is noted that, it can be achieved through improving the skill levels of employees, R&D and promoting joint-venture. Individual organisations can take the leading role in improving skills of the employees. Further, they can initiate R&D to identify effective mechanisms of improving the efficiency of organisations. Different case study researches can be carried-out with especially international organisations that have shown great success in their business activities. Respondents have built-up their faith on promoting joint-venture with foreign companies to improve the skills and efficiency. This may be due to the different exposures and experiences gained through foreign companies to improve their current practices.

Adopting Incentive Awarding Mechanism – Respondents felt the incentives can help employees to encourage and motivate themselves. Incentives can be given as performance bonuses or providing training opportunities to improve their knowledge and skills. The organisation can provide financial incentives for staff to undertake long-term training programmes and continuously, professional development programmes such as short courses, seminars, conferences are also be considered. Further, respondents felt that giving incentives for practising and improving health and safety is important to develop the image of the construction industry. This can be implemented at two levels; government and individual organisational level. At the organisational level, incentives can be offered to their workers who observe health and safety rules. These practices can help the management to inculcate health and safety habits. However, this issue should be addressed by the government together with organisations as industry as a whole is performing far behind the acceptable levels of health and safety rules [22]. Further, the government could take a leading role in promoting organisations to adopt safety and health rules through introducing different incentive awarding mechanisms to organisations.

Imposing Quality Practices – According to respondents, the quality of the construction works can be enhanced through improving quality of works, employees, and quality standards. Pre-defined quality standards of a construction work can be easily achieved if the work is well defined which, in turn, reduces the errors. Respondents felt that the construction errors can be minimised or eliminated, adopting highly buildable designs. In order to raise the buildability, there should be closer cooperation among designers, contractors, specialist contractors, material suppliers and component manufacturers during the design and construction stages. Quality standards play a great role in guiding the construction team to achieve the pre-defined quality of the final product. Therefore, existing quality standards should be reviewed, maintained and improved yearly. The strategies like total quality management mechanisms can be implemented. Further, respondents also felt that the career development of the construction team would help to improve the quality. For instance, career development programmes can improve employees'

carrier achieving quality outputs. Further, organisations can identify individuals' career paths and help them to develop their careers to motivate them to retain in the same organisation which in-turn raise the performance levels of the organisation.

Improving Professionalism – Improving professionalism was identified as the fourth factor. Respondents felt that professionalism can improve through enhancing professional practices, relationships and knowledge. Respondents proposed that the improving knowledge of professionalism can be started at the primary education level and continuously carried out up to the practitioner level. At school and institutional education, several modules can be included to their curriculums, where, as at the practitioner level, individuals can convert their knowledge in to practice. Further, certain guidance can be given through codes of conduct and exposures through making various relationships between different parties in the industry.

Improving Procurement Strategies – In the fifth factor, improving procurement strategies was observed. In Sri Lanka most of the contracts are based on traditional procurement method. Other procurement systems like joint-ventures, partnering, etc., are still at a very low profile. However, respondents felt that if these new strategies are developed, it will lead the industry towards the international market.

4. Conclusions

The research revealed that currently, there are many problems faced by the construction industry in Sri Lanka as seen by consultants and contractors. Sixty one challengers were tested and 46 are shown significant. They are from ten different areas including financial, government policies, technology, management and coordination, R&D, resource, safety, training and development social and skill levels. Further, the research identified 13 main motivators to help construction industry participants to improve the performance. Among these motivators, factor analysis revealed that some sub-factors were more important than others. Based on Eigenvalues, the five important factors were established to enable the construction industry to enhance its image. They are: enhancing industry skills and efficiency, adopting incentive awarding mechanism, imposing quality practices, improving professionalism, improving procurement strategies. These findings will create a momentum to all who are in the construction industry to look back on their existing practices and performance. Further, the recommendations given by identified factors will provide a simple guidance raising the image of the construction industry.

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