ENGINEER - Vol. LV, No. 03, pp. [101-112], 2022

DOI: http://doi.org/10.4038/engineer.v55i3.7525

Organisational Factors Affecting the Productivity of Labour in Sri Lankan Building Construction Projects: Perspective of Engineers

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Abstract: Sources highlight the poor organisational practices of the construction industry in many developing countries that result in low productivity levels in labour operations. This study aimed to identify the critical factors related to the management/organisational practices that significantly influence the labour productivity in Sri Lankan building construction projects based on the perspectives of engineers. The study methodology encompassed both qualitative and quantitative approaches through a comprehensive literature review, a questionnaire survey and a series of industry consultative meetings. The study determined 31 critical factors, where salary delays, low salaries for labourers, lack of labour training facilities, poor labour management and lack of labour motivation were found in the top five rankings. Statistical tests ensured the validity and reliability of the results. Overall findings highlight the need for reinforcing the current organisational policies of construction firms related to financial processes, communication approaches, resource management and performance management practices to the new normal situations. The study outcomes may push the industry to reduce the gap between the management policies and labour operations. Though the study findings are limited to the Sri Lankan construction sector, some of them may also be tested in other developing countries in similar scenarios.

Keywords: Building project, Construction management, Labour productivity, Sri Lanka

1. Introduction

The construction industry plays a crucial role in achieving the socio-economic goals of a nation [1]. Improvement in the productivity of construction operations towards profitability is the central focus area in the construction industry for any nation [2]. To achieve the expected income from any construction project in general, it is important to have a good controlling hand on the organisational factors that contribute to the integrated production composition [3]. Effective management of construction resources can lead to higher productivity, and it can assist in achieving expected time and cost savings [2]. A better understanding of the factors that affect the productivity of labour operations can enable managers and engineers to distribute resources effectively [3].

Studies highlight that there is an essential need for upgrading the current management and organisation related practices towards the productivity improvement of construction labour operations in many developing countries, like Sri Lanka [2-4]. The productivity improvement of construction labour is crucial for each construction firm to achieve the project goals, especially in building projects. Notably, the consultations with the Construction Industry Development Authority (CIDA) of Sri Lanka reveal that many construction firms in developing countries place higher investments

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in the construction of buildings than in other types of construction. The observations and perspectives of the engineers are very important since they can play a central role in upgrading the current management and organisation related practices in construction projects. Considering these aspects, this study aims to determine the critical factors related to the management/organisation practices that affect the productivity of labour operations in the building construction projects in the current scenario in Sri Lanka, based on the viewpoint of engineers. The study intends to identify these factors qualitatively. It further attempts to quantify the impact levels of these factors on the productivity of labour operations as well as to find out the ways for required future actions from relevant authorities to improve the current organisational practices. This will be beneficial to the construction industry of many developing countries for successfully facing productivity related issues against the new normal challenges of the industry.

2. Literature Review

Construction projects cannot be continued as planned if there is improper project financing [4]. Studies reported that the financial difficulties of clients significantly affected the physical progress of construction projects in many countries, namely, India [5], Indonesia [6], Iran [4] and Palestine [7]. On the other hand, Durdyev et al. [8] stated that inadequate financial policies of the government and financial weakness of contractors resulted in low productivity levels of construction operations in many construction projects in Turkmenistan. Due to improper financial related matters, the low salaries and salary delays were reported as the major factors affecting labour motivation in the construction industry in many countries [1, 4-5, 9-14]. The different methods of salary payments resulted in work dissatisfaction among labourers in the construction industry in Egypt [15].

Many studies highlight the lack of concern of organisations on skills development and training facilities for the labourers working in the construction industry in many countries [1-2, 11, 13-14, 16-19]. The skill shortages and lack of work experience of labourers have been determined as the major reasons for the low productivity level of construction operations in many countries [1, 5, 15, 20-22]. The skill shortages also affect the quality of work operations in construction projects [4, 23-24]. Studies also spotlight the need for improving training facilities for construction supervisors in many countries [4, 5, 15, 24], including Sri Lanka [25-26]. Supervision practices act as a vital link between the management and labour, and these are significant to improve the performance and productivity of labour operations in construction [15, 24, 26].

More than a decade ago, the progress of many construction projects in the United Kingdom was specifically affected due to inexperienced supervisors working at construction sites [27]. The cognitive skills and technical qualifications of supervisors were not at an adequate level to supervise construction operations in Zambia [28]. Incompetent supervisors, supervisor absenteeism and poor resource management skills had been the major problems for the Indonesian contractors [6]. Though no recent studies reported the supervisor absenteeism as a significant factor, their inefficient site management and poor site coordination skills have been the significant factors affecting the progress of construction projects in many countries' recent scenarios [12, 22-24, 26]. This confirms that the transferable skills of construction supervisors must be further addressed in the construction supervisory training programmes in many countries.

The lack of communication between the parties and unclear instructions to labourers were identified as the significant factors that affected the progress of many construction projects in Indonesia. Studies reported that communication problems between the parties influenced the productivity of construction operations in many countries, including India [2], Nigeria [29], Palestine [7], Qatar [30] and Sri Lanka [31]. The lack of periodic meetings with the labourers had caused productivity-related issues in many construction projects in the Indian construction industry [32]. Poor decision making of the construction management team and inefficient supply chain management have also resulted in productivity-related problems in the Indian construction industry [23].

Low productivity of construction operations was reported in many construction projects due to poor management policies and procedures of construction firms in India [14], Qatar [30], United Arab Emirates [33] and Zimbabwe [9]. Lack of transportation facilities was identified as an influential factor on the performance of labour in the construction projects in Qatar [30], while Halwatura [31] stated that lack of medical

care facilities, food facilities and accommodation facilities affected the labour performance in the Sri Lankan construction projects. Studies highlight the need for industrial research applications at the organisational level among construction firms to identify the problematic areas in the management policies and above-mentioned facilities [29, 34]. Overall, the current study has comprehensively reviewed the past studies that investigated the organisation/management related practices and the factors influencing construction productivity in different countries, as shown in Table 1.

Table 1 – Recent Studies Focusing on Construction Labour Productivity in Different Countries

Country	Studies
Australia	[44]
Egypt	[3, 22]
India	[2, 5, 14, 20, 23, 37-38, 45-51]
Indonesia	[6, 34]
Iran	[4, 11, 52]
Kuwait	[39]
Malaysia	[53-54]
New Zealand	[55-56]
Nigeria	[13, 17-18, 24, 40]
Palestine	[7, 57]
Qatar	[30]
South Africa	[12, 42, 58-59]
Spain	[10]
Sri Lanka	[1, 16, 21, 31, 35, 41, 60]
Trinidad & Tobacco	[36]
Turkey	[61-62]
Turkmenistan	[8]
United Arab Emirates	[33]
Vietnam	[15]
Zimbabwe	[9]

2.1 Sri Lankan Context

Considering the Sri Lankan construction sector, though only a few studies have investigated improving the productivity of construction operations, Manoharan et al. [35] have comprehensively identified a wide range of factors that significantly affect the performance and productivity of construction operations in the Sri Lankan construction industry. Considering the current practices related to management/organisation, a total of 41 factors were presented by Manoharan et al. [35]. A comprehensive literature investigation and a series of structured interviews were conducted by them to qualitatively identify these factors. Through popular online search engines and library facilities, potential research articles were selected by Manoharan et al. [35] in accordance with their reputation and impact ratings as proposed in the methodology by Schweber and Leiringer [63]. Since there were not many recent studies that investigated labour performance in the Sri Lankan construction sector, considering the importance of understanding the current practices of the industry, the interviews were conducted by Manoharan et al. [35] among construction workers from the Sri Lankan construction industry in a wide range of working categories, covering the construction activities of all types of construction projects (including building, road/highway, bridge, water supply and irrigation works).

This study comprehensively compared the factors identified by Manoharan et al. [35] with the other recent studies from foreign context, as illustrated in Table 2. The mapping results confirm the importance of all the factors shown in Table 2 to be considered for applying the quantitative methods.

Table 2 – Significant Management/Organisation Related Factors Influencing Labour Productivity in Different Countries

Code	Factors	Past Studies from Different Countries																		
		Australia	Egypt	India	Indonesia	Iran	Kuwait	Malaysia	New Zealand	Nigeria	Palestine	Qatar	South Africa	Spain	Sri Lanka	Trinidad & Tobacco	Turkey	Turkmenistan	United Arab Emirates	Vietnam	Zimbabwe
M1	Too many types of salary payment				X															X	
M2	Delay in salary payment			X		X				X			X	X	X	X			X		X
M3	Low salary for labourers			X		X				X			X	X	X	X					X
M4	Financial difficulties of the owner			X	X	X					X										

M5	Improper project financing					X											X			
M6	Financial weakness of the contractor					X											X			
M7	Inadequate financial policies of the government					X					X						X			
M8	Lack of proper incentives						X			X					X						
M9	Lack of motivation for labourers			X		X				X		X		X	X	X	X				X
M10	Lack of training facilities for labourers			X	X	X				X		X			X	X	X				
M11	No labour rewarding mechanism									X			X		X						
M12	Improper promotion opportunities for labourers					X				X											
M13	Less welfare facilities for labourers									X	X										
M14	Lack of job security for labourers			X		X									X				X		
M15	Conflicting safety policies		X																X		
M16	Improper work planning	X		X	X	X	X	X	X			X			X	X				X	X
M17	Poor supervision of labour operations	X	X	X	X	X	X		X			X		X	X	X	X			X	X
M18	Poor leadership skills of supervisors				X					X		X	X			X			X		
M19	Poor relationship between labourers and supervisors				X		X			X		X									
M20	Poor labour management	X	X	X	X	X	X	X	X			X		X	X	X	X			X	X
M21	Supervisor's cognitive skills			X											X	X					X
M22	Supervisor's experience		X	X											X						
M23	Supervisor's absenteeism				X																
M24	Inefficient site management	X	X	X	X	X	X	X	X	X		X		X	X	X				X	X
M25	Poor site coordination	X	X	X		X	X	X		X		X		X	X	X	X			X	X
M26	Poor performance evaluation of labour skills									X					X						
M27	Poor resource management			X	X				X						X	X				X	X
M28	Lack of communication and cooperation between the parties		X		X		X			X	X	X			X	X				X	X
M29	Lack of periodic meeting with labourers		X	X	X		X			X					X	X				X	X
M30	Unclear instructions to labourers		X		X		X			X		X			X	X				X	X
M31	Enterprise failure										X		X			X					X
M32	Decision making			X																	
M33	Supply chain management			X				X													
M34	Ethical behaviour of managers			X							X				X						
M35	Management policies and procedures			X								X							X		X
M36	Communication problems with foreign workers										X				X						
M37	Lack of transportation facilities											X			X						
M38	Lack of industrial research on construction labour operations										X				X						
M39	Lack of medical care facilities			X											X						
M40	Lack of food facilities			X											X						
M41	Lack of accommodation facilities														X						

3. Research Methodology

The methodology of this study includes quantitative approaches to assess the perspectives of engineers on the significant factors related to management/organisation practices shown in Table 2.

3.1 Questionnaire Survey

A questionnaire survey was carried out among civil engineers working in construction firms in Sri Lanka. A total of 90 construction firms participated in this survey, where an engineer represented his/her firm to respond to the survey questions based on their current management/organisation related practices in building construction projects. The Likert scale of five ordinal measures from 1 to 5 (very low effect to very high effect) was used in the survey questions on the factors. Cognitive interviews were conducted among engineers from six construction firms to validate the questionnaire survey. As a result of cognitive interviews, minor improvements were made in the questionnaire designs considering the understanding level of the survey participants on the questions.

As recommended by Showkat and Praveen [64], the snowball sampling method was used to find the respondents for the questionnaire survey since the actual sample size with target characteristics was very difficult to decide. A small population of known individual construction firms participated during the initial stage of the survey. The survey participants were asked to name other potential engineers working in other projects/firms with their contact details, and the sample size was then expanded through them up to 90.

3.2 Quantitative Analysis

To quantify the impacts of the factors on the productivity of labour operations, the Relative Importance Index (RII) method was applied. As recommended by past studies [15, 65], Equation (1) was used to calculate RII.

$$RII = \Sigma W/(A * N) \quad \ldots (1)$$

where, "W" represents the weight assigned to each factor by response ranges (1 – Very low, 2 – Low, 3 – Moderate, 4 – High, 5 – Very high); "A" represents the maximum weight given (A equals 5); "N" represents the total number of responses.

The higher RII value illustrates that the factor has a high impact on the productivity of labour operations. As recommended by past studies [15, 35, 65], the minimum RII value to decide the corresponding factor as critical was 0.7, whereas 0.5 and 0.3 were the lower margin values of RII for 'Moderate' and 'Low' levels of impact, respectively. Here, the RII values of less than 0.3 indicate 'Very low' levels of impact. The Coefficient of Variation (CV) value was also calculated for each factor to check the reliability and validity of the results. The CV value is defined as the ratio between standard deviation and mean values [66]. Here, the smaller CV value indicates that the values given by the respondents are around the mean values. According to the Labour Force Survey Guide 2020 of Canada [67], the CV values should be less than 0.3 to ensure that the findings are reliable for the study.

3.3 Industry Consultative Meetings and Workshops

A series of meetings and industry consultative workshops were conducted among construction experts from various working categories to discuss the effects of the identified critical factors and the required actions that need to be taken from relevant authorities. Problem-based communication approaches were mainly used in the discussion sessions. The study findings were validated through these discussion outcomes.

4. Results and Discussion

The detailed profile of the survey respondents is shown in Table 3, based on the CIDA grades and work experience of the respondents in the building construction field. Construction Industry Development Authority (CIDA) is the recognised body in Sri Lanka, which provides the contractors' registration. According to the National Registration and Grading Scheme of CIDA [68], the contractors are categorised into 11 grades based on their financial capacity, technical ability, and experience gained in the field. In this survey, only the upper graded construction firms were considered, who had a minimum C4 grade of CIDA registration. According to Construction Industry Development Act No.33 of 2014 [68], the minimum financial limit of project investment for the C4 grade is 50 million Sri Lankan Rupees. The highest percentage of respondents were C4 grade contractors (42%). Notably, around 20 contractors participated in this survey from the building construction projects where billions of Sri Lankan Rupees were invested. Referring to their work experience in the construction field, more than 95% had a

minimum of 5 years of work experience, whereas the majority was in the range of 5-10 years (39%).

The impact levels of the organisational factors affecting labour productivity are shown in Table 4 with the mean (M), standard deviation (SD), relative important index (RII), coefficient of variation (CV) values and ranking (R). Among those 41 factors, RII values of 31 factors had more than 0.7, and those factors were decided as critical. Delay in salary payment, low salary, lack of training facilities for labourers, poor labour management and lack of motivation for labourers were the top five ranking factors related to management and organisational practices. This section discusses the leading factors compared with the findings presented by past studies from Sri Lanka and other foreign context, also describing the reasons for the current status of those factors, how those are linked with other factors and the types of actions required from the relevant organisation or authority.

4.1 Salary Delays and Low Salaries for Labourers

The study highlights the significance of upgrading the current organisational policies of many construction firms to avoid salary-related issues among labourers affecting the progress of construction activities. Past studies spotlighted that the progress of construction projects was significantly affected due to salary delays and low salaries for labourers in many other countries, namely India [5, 14], Iran [4, 11], Nigeria [13, 17], Trinidad & Tobacco [36], Spain [10], South Africa [12] and Zimbabwe [9]. Considering the Sri Lankan context, industry consultative experts revealed that these salary delays occur, especially in most middle-level contracting firms due to their financial weakness. This leads to low motivation and work dissatisfaction among labourers at construction sites, also forcing them to find other ways of earning money. The work dissatisfaction among labourers has also resulted in productivity-related issues in many construction projects in Iran [11] and Nigeria [17]. Due to the work dissatisfaction of labourers, labour strikes affected the performance of labour operations in many construction projects in Indonesia [6].

4.2 Lack of Labour Motivation

The study reports that the lack of motivation among labourers is a barrier to improving the productivity of labour operations in building construction projects in Sri Lanka. It has also been a significant factor affecting the progress of construction in many other countries, including India [32, 37-38], Nigeria [24, 29] and Qatar [30]. No labour rewarding mechanisms [12, 24], lack of proper incentives [13, 30, 39], improper promotion opportunities [11, 40], fewer welfare facilities for labourers [17], lack of job security for labourers [11, 14, 20, 31] and conflicting job policies [22] were found as the major reasons for the lack of labour motivation that had led to the poor labour performance in construction. Considering the Sri Lankan construction sector, though previous studies [21, 41] identified the need for improving labour motivation, the current study findings confirm that the construction firms have not taken adequate steps to address this issue. The industry consultative experts also highlighted that the construction firms need to be concerned about implementing organisational policies related to target achievement benchmarking, labour performance assessments, labour rewarding and other welfare facilities within their organisation level.

Table 3 – Categorisation of Survey Respondents based on CIDA Grade and Experience in the Construction Field

Profile	Variables	Number of Responses	Percentage
CIDA Grade of Contractors (Financial Limit of the Projects - LKR in Million)	CS2 / CS1 (X > 1500)	7	8%
	C1 (1500 >= X > 600)	15	17%
	C2 (600 >= X > 300)	19	21%
	C3 (300 >= X > 150)	11	12%
	C4 (150 >= X > 50)	38	42%
Experience in the construction field	Less than 5 Years	2	2%
	5–10 Years	35	39%
	11–15 Years	21	23%
	16–20 Years	11	12%
	21–25 Years	13	14%
	More than 25 Years	8	9%

Table 4 – Impact of Organisation/Management Related Factors on Labour Productivity

Code	M	SD	RII	CV	R	Level of Impact
M2	4.22	0.81	0.84	0.20	1	High
M3	4.14	0.72	0.83	0.17	2	High
M10	4.10	0.79	0.82	0.20	3	High
M20	4.10	0.84	0.82	0.21	3	High
M9	4.06	0.87	0.81	0.21	5	High
M26	4.03	0.91	0.81	0.22	6	High
M1	4.01	0.90	0.80	0.23	7	High
M28	4.01	0.78	0.80	0.21	7	High
M18	4.00	0.82	0.80	0.20	9	High
M32	3.99	0.75	0.80	0.19	10	High
M27	3.98	0.82	0.80	0.20	11	High
M17	3.96	0.76	0.79	0.19	12	High
M24	3.96	0.49	0.79	0.20	12	High
M19	3.94	0.74	0.79	0.19	14	High
M21	3.94	0.73	0.79	0.21	14	High
M25	3.94	0.82	0.79	0.21	14	High
M11	3.92	0.68	0.78	0.18	17	High
M30	3.92	0.71	0.78	0.17	17	High
M16	3.88	0.69	0.78	0.18	19	High
M22	3.88	0.90	0.78	0.23	19	High
M13	3.78	0.73	0.76	0.20	21	High
M12	3.77	0.82	0.75	0.22	22	High
M5	3.70	0.72	0.74	0.19	23	High
M29	3.69	0.78	0.74	0.22	24	High
M14	3.67	0.77	0.73	0.21	25	High
M33	3.67	0.88	0.73	0.25	25	High
M23	3.64	0.76	0.73	0.21	27	High
M15	3.63	0.74	0.73	0.21	28	High
M4	3.62	0.75	0.72	0.21	29	High
M6	3.62	0.71	0.72	0.19	29	High
M8	3.56	0.68	0.71	0.19	31	High
M34	3.44	0.78	0.69	0.23	32	Moderate
M35	3.44	0.83	0.69	0.25	32	Moderate
M38	3.39	0.69	0.68	0.20	34	Moderate
M37	3.31	0.66	0.66	0.20	35	Moderate
M41	3.30	0.69	0.66	0.21	36	Moderate
M31	3.23	0.61	0.65	0.18	37	Moderate
M39	3.17	0.78	0.63	0.26	38	Moderate
M40	3.08	0.66	0.62	0.20	39	Moderate
M7	2.33	0.84	0.47	0.36	40	Low
M36	1.49	0.62	0.30	0.40	41	Very Low

4.3 Lack of Training Facilities for Labourers

The study highlights the lack of focus of organisations on improving labour training facilities in the Sri Lankan construction sector. This confirms that the problems related to skill shortage among labourers have not been addressed well by the relevant authorities, leading to contribution of low performance of labour in construction. Similar status has also been reported in many other countries, namely India [2, 14], Indonesia [34], Iran [11], Nigeria [13, 17-18], Qatar [30] and South Africa [42]. The effectiveness of the construction industry in each country depends on the quality of the workforce, education and training [28]. In the Sri Lankan context, studies highlight that the school curricula do not consist of a sufficient level of content related to construction education [25, 35]. Industry Sector Skills Councils (ISSC) of Sri Lanka also revealed that the industry needs are not sufficiently covered in many training programmes of public sector institutes [25]. ISSC also particularly highlighted the poor cognitive and job-specific technical skills of the Sri Lankan labourers in recent scenarios. Manoharan et al. [43] have accentuated the need for improving the cognitive and self-management skills of Sri Lankan labourers through a systematic comparison of the work-related skills between Sri Lankan labour and other leading foreign labour forces, namely Arabian, Chinese, Korean and Malaysian. Manoharan et al. [43] have also revealed that construction training institutions in Sri Lanka need to have a special focus on the technical skills of labourers in concreting, bar bending, plastering, tiling, welding, electrical works and equipment handling.

4.4 Poor Labour Management, Decision Making and Leadership Skills of Supervisors

The study points out the need for improving the transferable and self-management skills of Sri Lankan construction supervisors. Poor labour management, poor decision making and poor leadership skills were identified as the major barriers to labour productivity improvement in Sri Lankan building construction projects. Recent studies revealed that the poor supervision of labour has been a major cause that resulted in low productivity in many construction projects in Australia [44], Egypt [22], India [2, 45], Spain [10], Vietnam [15] and Zimbabwe [9]. Studies also highlighted that the poor leadership skills of construction supervisors were the major barriers to the performance improvement of construction operations in Indonesia [6], Nigeria [24], Qatar [30], and Trinidad & Tobacco [36]. Considering the industry practices in the Nigerian construction sector, Onyekachi [24] has highlighted the need for improving the relationship between labourers and construction supervisors for productivity improvement in construction. Considering the Sri Lankan context, past studies [26, 31, 41] have also reported poor labour management practices in many construction projects. Though the productivity of construction operations is significantly affected due to poor labour management and supervision practices, most organisations do not take adequate steps to address these issues in the Sri Lankan construction industry [41]. Tertiary and

Vocational Education Commission [25] and Manoharan et al. [43] highlighted the need of upgrading the construction supervisory training programmes in the Sri Lankan construction industry with special attention on improving the self-management and transferable skills of construction supervisors.

4.5 Poor Performance Evaluation of Labour Skills

The study spotlights the unavailability of systematic mechanisms that can be used by construction firms in Sri Lanka to evaluate labour skills at construction sites. This has resulted in the unskilled labourers working as skilled labourers in many construction projects in Sri Lanka [19]. The poor performance evaluation of labour skills was also highlighted by Fernando et al. [41] as a significant factor influencing the labour productivity in the Sri Lankan construction industry. Shehata & El-Gohary [3] emphasised that construction managers, engineers and supervisory workers need to be familiar with the methods to evaluate the performance of labourers. Systematic methods of labour performance evaluations are important to the construction management team for making the right decisions in the recruitment, training and promotion matters for labourers.

4.6 Lack of Communication and Cooperation between the Parties

The study reveals that the lack of communication and cooperation between the parties significantly influence the progress of many building construction projects in Sri Lanka. Communication management is the key to the construction management processes, especially to transfer clear information between the project participants. Poor communication and cooperation between the parties result in various problems in construction operations, such as poor construction methods, reworks, construction delays, etc., leading to low productivity and quality in construction works [2, 6]. Considering the construction management practices in Sri Lanka, engineers revealed that communication management related principles should be emphasised in school education and other vocational training programmes. Construction firms should also consider special attention to implementing effective management policies addressing the communication-related problems among construction workers in all categories.

4.7 Reliability and Validity of the Findings

Overall, the CV values of each factor ensure the reliability and precision of these findings. According to the range of CV values mentioned in the Labour Force Survey Guide 2020 of Canada, the CV values of all factors were within the allowable limit except the following two.

- Inadequate financial policies of the government (M7)
- Communication problems with foreign workers (M36)

The reason for the exceeded CV values of the above-mentioned factors can be justified. The low mean values can be an impact on the high CV values of these factors. Hence, the results of these two factors do not affect the objectives of the study, and it does not mean that the CV values highlight the less precision of the results of the above mentioned two factors. In addition, the discussion outcomes of the industry consultative workshops and meetings also ensured the validity of the study findings.

5. Conclusions and Recommendations

The study has identified the critical factors related to the management and organisation practices that affect the labour productivity in Sri Lankan building construction projects based on the viewpoint of engineers. The impact levels of the factors show how much attention needs to be considered for each component of management practices for improving the productivity of construction operations towards profitability. The study also presented why those factors are critical and how those influence the main tasks. The significant findings of this study have been comprehensively compared with past studies from Sri Lanka and other foreign contexts. The validity and reliability of the overall study findings have also been ensured through comprehensive approaches.

Overall, the study specifies the significant areas where the construction firms need to take on actions in their construction management practices for productivity improvement. The findings highlight the need for upgrading the current organisational policies of construction firms to reinforce the current processes related to financial flows, communication facilities, resource management and performance management. The study also emphasises the

need for upgrading existing vocational training programmes related to construction education. Based on the industry need, the study spotlights the components which are not sufficiently covered in the currently available training programmes. Hence, the study findings will be useful to the curriculum developers and training providers in the construction field to fill the gaps between the learning outcomes of existing training programmes and the expectations of the industry.

The study outcomes are expected to force the industry to reduce the gap between the management policies and labour operations. This may lead the construction industry to face the evolving challenges successfully and ensure long-term sustainability towards the new normal. The study recommends that future studies focus on improving labour management and supervision practices in construction operations. The study also recommends developing effective performance evaluation mechanisms for the labourers working at construction sites, leading to labour skill development, productivity improvement and labour rewarding. Though the study outcomes are limited to the Sri Lankan context, some of them may also be useful to the construction sector in other countries in similar scenarios.

Acknowledgement

The authors wish to acknowledge the construction professionals who actively participated in the interviews, surveys, industry consultative workshops and review discussions of this study.

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