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Organisational elements controlling labour efficiency in building construction operations – a construction supervisors' perspective

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Abstract

Purpose – Labour efficiency is the key component for the long-term sustainability of construction firms. Recent studies show that modernising organisational/managerial processes is necessary to raise labour efficiency in many emerging nations. Construction supervision is a crucial element in organisational/managerial practices, which provide blood circulation to the project operations by directing labour. Accordingly, this study aims to quantify the impacts of crucial organisational/managerial elements on the efficiency of labour in building construction projects based on the viewpoint of construction supervisors.

Findings – A total of 28 factors were determined as critical, where lack of labour motivation, poor labour training facilities, poor performance evaluation practices, no labour rewarding mechanism and poor communication/cooperation between parties were judged to be the top five key issues in the list. The validity and reliability of the study findings were ensured through statistical tests and the experts' discussion outcomes. In view of the evolving challenges facing the industry, the results indicate that the organisational policies of construction enterprises in place addressing financial procedures, communication strategies, resource management and performance management practices must be enhanced.

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Research limitations/implications – The study findings will make a substantial contribution to reducing the disparity between organisation/management policies and labour practices towards changing how the sector operates to increase labour efficiency in construction projects.

Originality/value – This study contributes to addressing the knowledge gap in the industry associated with the organisational protocols, especially to understand/predict how such elements are significant, how much they influence the efficiency of construction practices and what steps can be made to limit their effects on labour efficiency in construction. These could be crucial in modernising organisational policies and procedures for construction management.

Keywords Construction industry, Developing countries, Construction supervisors, Labour efficiency, Organisational management, Productivity improvement

Paper type Research paper

1. Introduction and background study

The status of the construction industry is crucial in accomplishing a country's socio-economic objectives (Silva *et al.*, 2018). The growth of a nation's infrastructure and facilities is significantly influenced by the development of the construction sector (Halwatura, 2015). In a variety of nations, the construction industry makes up a significant portion of the global domestic product (GDP), including 5.5% in Japan, 6.1% in the United Kingdom and 9% in Oman (Umar, 2021). According to discussions with the Construction Industry Development Authority (CIDA), the construction sector accounts for 6% of Sri Lanka's GDP. According to Umar (2021), the construction industry has expanded quickly in many emerging nations. As a result, numerous employments have been produced for a variety of job categories in many developing countries (Umar, 2021). This trend is anticipated to continue for the foreseeable future (Manoharan *et al.*, 2022).

The primary attention of the construction sector of any nation should be on increasing the efficiency of construction labour operations towards the achievement of the expected profitability (Ghate and Minde, 2016). But, the construction industry has been facing productivity-related challenges in many emerging nations, which hinders the physical pace of construction projects (Ghoddousi *et al.*, 2015; Nourhane *et al.*, 2018; Silva *et al.*, 2018). Work productivity mainly depends on work efficiency, while efficiency covers both economic and operational aspects of the industry (Pekuri *et al.*, 2011). Many studies indicate that a variety of organisational elements are the primary factors contributing to productivity loss in the construction industry of those countries (Soham and Rajiv, 2013; Onyekachi, 2018; Dinh and Nguyen, 2019; Murari and Joshi, 2019; Manoharan *et al.*, 2020). Notably, low labour productivity was named as one of the key causes of construction delays in many developing countries (Kesavan *et al.*, 2015).

In general, it is critical to exert effective control over the organisational elements that undergo the integrated production composition to generate the desired profits from any building project (Shehata and El-Gohary, 2011). Organisational policies play a significant role in resource management practices, which influence the time of completion, cost savings and the quantity and quality of work outputs (Ghate and Minde, 2016). Construction supervision is one of the crucial elements in recourse management practices, especially the construction supervisory workers are the key resources that provide the blood circulation for the construction project operations by directing a wide range of labour operations (Shehata and El-Gohary, 2011). Accordingly, there is an essential need for construction firms in many developing nations like Sri Lanka to enhance their current construction management practices associated with organisational policies and supervision practices for addressing productivity-related challenges and opportunities (Shehata and El-Gohary, 2011; Shahab and Audrius, 2018; Ghate and Minde, 2016). Notably, discussions with the Sri Lankan CIDA specifically emphasise that the importance of addressing this need is much bigger for building construction practices compared with other types since many construction

companies in developing nations invest more in building construction than in other types of construction (Manoharan *et al.*, 2022).

With the above-mentioned considerations, this study attempts to identify the crucial elements related to management and organisational practices that influence labour efficiency in building construction projects based on the perspectives of construction supervisory workers. The study qualitatively identifies those elements at its initial stage. It also makes an effort to quantify the extent to which those elements have an impact on the efficiency of labour operations and to identify the necessary future measures from relevant authorities to enhance the current organisational practices. This will help the construction sector in many developing nations to overcome productivity-related hurdles posed by the sector's evolving challenges.

The current study emphasises that the above-stated challenges and needs have not been sufficiently addressed in earlier studies. There are notable gaps that need to be addressed by studies in the levels of understanding/predicting the development/upgrading process of organisational protocols to achieve higher efficiency in construction operations. Accordingly, this study intends to address the research questions on what characteristics of organisational elements influence construction labour efficiency, how significant they are, what levels of their influences can be theoretically considered and practically applied and what actions should be made to limit their effects on construction labour efficiency. Addressing these research questions will lead to a crucial contribution to modernising organisational policies and procedures for construction management.

Within the scopes and intentions described in the above paragraphs, the rest of the paper is structured as follows; Section 2 reviews the relevant literature comprehensively, considering the contexts of various nations while Section 3 illustrates the methodologies used for the study purpose with both qualitative and quantitative approaches. Section 4 illustrates the analysis and results, especially the impact levels of organisational elements on construction labour efficiency in building project operations. Furthermore, Section 5 discusses the results with the necessary comparison of earlier studies from the contexts of various developing countries to the key findings while also outlining the factors that led to their current status, how they relate to other elements and the types of actions that the relevant authorities should take. Finally, Section 6 describes the conclusion of the study. Importantly, this section discusses the summary of the study findings connected to various implications, contributions, limitations and recommendations.

2. Literature review

The construction projects cannot proceed as anticipated when project financing is inadequate (Shahab and Audrius, 2018). According to past studies, the physical progress of construction projects in the nations of India (Murari and Joshi, 2019), Indonesia (Soekiman *et al.*, 2011), Iran (Shahab and Audrius, 2018) and Palestine (Mahamid, 2013) was considerably hampered by the financial issues of clients. On the other hand, Durdyev *et al.* (2013) claimed that poor financial management of the government and the contractors' financial fragility led to low productivity levels of construction operations in several construction projects in Turkmenistan. Low compensation and salary delays were cited as the main factors affecting worker motivation in the construction industry in several countries due to incorrect finance-related matters (Chigara and Moyo, 2014; Robles *et al.*, 2014; Ghoddousi *et al.*, 2015; Windapo, 2016; Zannah *et al.*, 2017; Shahab and Audrius, 2018; Silva *et al.*, 2018; Mistri *et al.*, 2019; Murari and Joshi, 2019). Notably, worker dissatisfaction in the construction industry of Egypt was caused by various unfamiliar salary payment systems (Dinh and Nguyen, 2019).

Various studies (Kesavan *et al.*, 2014; Ghoddousi *et al.*, 2015; Zannah *et al.*, 2017; Silva *et al.*, 2018; Ghate and Minde, 2016; Mistri *et al.*, 2019) highlight the poor attention of construction

organisations in providing training opportunities and developing workers' abilities in the global construction business. The main causes of the low productivity level of construction operations in many countries have been identified due to skill shortages and lack of work experience (Dharani, 2015; Kesavan *et al.*, 2015; Nourhane *et al.*, 2018; Silva *et al.*, 2018; Dinh and Nguyen, 2019; Murari and Joshi, 2019). The quality of work operations in construction projects is also impacted by skills shortages (Saurav *et al.*, 2017; Onyekachchi, 2018; Shahab and Audrius, 2018). Studies highlight the need for effective training programmes that enhance the skills and work qualities of both labourers and supervisors (Onyekachchi, 2018; Shahab and Audrius, 2018; Dinh and Nguyen, 2019; Murari and Joshi, 2019). Importantly, the effectiveness and productivity of construction labour operations can be significantly improved by supervision techniques, which serve as a crucial conduit between management and labour (Onyekachchi, 2018; Dinh and Nguyen, 2019; Manoharan *et al.*, 2022).

The advancement of numerous construction projects in the United Kingdom was especially hampered more than ten years ago by unskilled supervisors working on the job sites (Paul, 2002). In Zambia, supervisors' inabilities in handling technical matters were the major barrier to properly overseeing construction projects (Muya *et al.*, 2003). For the Indonesian contractors, the ineffective work process of supervisors, supervisor absenteeism and inadequate resource management abilities had been the main issues (Soekiman *et al.*, 2011).

A large number of building projects in Indonesia were found to have been hampered by poor communication between the parties and confusing instructions given to workers (Soekiman *et al.*, 2011). According to studies, poor interparty communication has a negative impact on the productivity of building projects in various nations, including India (Ghate and Minde, 2016), Nigeria (Olabosipo *et al.*, 2011), Palestine (Mahamid, 2013), Qatar (Jarkas *et al.*, 2012) and Sri Lanka (Halwatura, 2015). Shashank *et al.* (2014) highlight the lack of site meetings and improper instructions to labourers have led many Indian construction firms to face productivity-related problems. The Indian construction industry has also experienced issues with productivity as a result of poor decision-making and ineffective supply chain management practices of construction organisations (Saurav *et al.*, 2017).

A notable number of construction projects have reported low efficiency of construction operations as a result of subpar management practices of construction organisations in India (Mistri *et al.*, 2019), Qatar (Jarkas *et al.*, 2012), United Arab Emirates (Ailabouni *et al.*, 2009) and Zimbabwe (Chigara and Moyo, 2014). The performance of the labour force in construction projects in Qatar was shown to be influenced by a lack of transportation facilities (Jarkas *et al.*, 2012). The requirement for industrial research applications at the organisational level among construction businesses to pinpoint the trouble spots in the management strategies and aforementioned infrastructure has been highlighted by some studies (Olabosipo *et al.*, 2011; Adi and Ni'am, 2012). As can be seen in Table 1, the current study has thoroughly evaluated earlier investigations on organisational/management-related practices and the variables affecting construction efficiency in various developing countries.

2.1 Sri Lankan context

A few studies have looked into the variables influencing construction productivity in Sri Lanka. According to Kesavan *et al.* (2015), the most labour-related problems in Sri Lanka's construction industry were determined to be a lack of workers, personal conflicts among workers, low motivation and morale among workers, inadequate experience among workers and work-related injuries. On the other hand, Widanagamachchi (2013) noted that the absence of labour motivation in Sri Lankan construction projects was mostly caused due to the transitory nature of the job, the demanding work environment and the lack of social recognition. According to Fernando *et al.* (2016), the majority of firms in the Sri Lankan

Table 1.
Recent studies focussing on the efficiency of construction labour in various developing nations

Country	Studies
India	Soham and Rajiv (2013), Dharani (2015), Sangole and Rani (2015), Saravanan and Surendar (2016), Thiyagu *et al.* (2016), Dixit *et al.* (2017), Patel *et al.* (2017), Saurav *et al.* (2017), Singh *et al.* (2017), Ghate and Minde (2016), Mistri *et al.* (2019), Murari and Joshi (2019), Agrawal and Halder (2020), Saurav and Kaaraayaarthi (2020)
Indonesia	Soekiman *et al.* (2011), Adi and Ni'am (2012)
Iran	Shahab and Audrius (2018), Ghoddousi *et al.* (2015), Ghoddousi and Hosseini (2012)
Nigeria	Ayegba and Agbo (2014), Oseghale *et al.* (2015), Okoye *et al.* (2016), Zannah *et al.* (2017), Onyekachi (2018)
Palestine	Enshassi *et al.* (2007), Mahamid (2013)
South Africa	Rasool and Botha (2011), Windapo (2016), Oke *et al.* (2018), Orando and Isabirye (2018)
Sri Lanka	Kesavan *et al.* (2014), Halwatura (2015), Kesavan *et al.* (2015), Fernando *et al.* (2016), Silva *et al.* (2018), Manoharan *et al.* (2020)
Trinidad & Tobacco	Hickson and Ellis (2013)
Turkey	Kaya *et al.* (2014), Kazaz *et al.* (2016)
Turkmenistan	Durdyev *et al.* (2013)
Vietnam	Dinh and Nguyen (2019)
Zimbabwe	Chigara and Moyo (2014)

construction industry do not follow an appropriate performance evaluation system for their workforce. Moreover, inadequate supervision, a lack of medical care facilities, problems with overtime, a lack of work security, problems with payments and insufficient communication were identified by Halwatura (2015) as the main factors influencing labour productivity in Sri Lankan building construction projects.

In addition to the above, Manoharan *et al.* (2020) have comprehensively identified a wide range of factors that significantly affect the performance and productivity of construction operations in the Sri Lankan construction industry, even though the fact that only a small number of studies have looked into increasing the efficiency of construction operations. Manoharan *et al.* (2020) offered a total of 41 criteria taking into account current management/organisational practices. Manoharan *et al.* (2020) conducted a comprehensive literature review and a series of structured interviews to qualitatively identify these characteristics. Potential research articles were chosen by Manoharan *et al.* (2020) based on their reputation and impact scores as suggested in the technique by Schweber and Leiringer (2012) using well-known online search engines and library resources. Considering the crucial of comprehending the current/recent practices of the industry, Manoharan *et al.* (2020) further conducted interviews with construction workers from the Sri Lankan construction industry in a variety of working categories because there were not many recent studies that looked into labour efficiency in the construction sector of Sri Lanka. Considering the above-mentioned important aspects, the current study evaluated the parameters indicated by Manoharan *et al.* (2020) with other recent studies from international contexts, as shown in Table 2. The mapping results support the necessity of taking into account each of the criteria listed in Table 2 when using the quantitative approaches.

3. Methodology

The methodology of this study includes qualitative and quantitative approaches to assess the perspectives of construction supervisory workers on the significant elements related to organisational practices shown in Table 2. Accordingly, Figure 1 shows the progressive flow of the approaches employed for this study towards the determination of the key variables and mitigation measures for modernising organisational policies and procedures in building construction projects.

Table 2.
Significant organisational elements affecting the efficiency of construction labour in various developing countries

Code	Organisational elements	Past studies from different countries											
		India	Indonesia	Iran	Nigeria	Palestine	South Africa	Sri Lanka	Trinidad and tobacco	Turkey	Turkmenistan	Vietnam	Zimbabwe
O1	Too many types of salary payment		X									X	
O2	Delay in salary payment	X		X	X		X	X	X				X
O3	Low salaries for labourers	X		X	X		X	X	X				X
O4	Financial difficulties of the owner	X	X	X		X							
O5	Improper project financing			X							X		
O6	Financial weakness of the contractor			X							X		
O7	Inadequate financial policies of the government			X		X					X		
O8	Lack of proper incentives				X			X					
O9	Lack of motivation for labourers	X		X	X			X	X	X			X
O10	Lack of training facilities for labourers	X	X	X	X			X	X	X			
O11	No labour rewarding mechanism				X		X	X					
O12	Improper promotion opportunities for labourers			X	X								

(*continued*)

Table 2.

Code	Organisational elements	Past studies from different countries											
		India	Indonesia	Iran	Nigeria	Palestine	South Africa	Sri Lanka	Trinidad and tobacco	Turkey	Turkmenistan	Vietnam	Zimbabwe
O13	Less welfare facilities for labourers				X	X							
O14	Lack of job security for labourers	X		X				X					
O15	Conflicting safety policies												
O16	Improper work planning	X	X	X				X	X			X	X
O17	Poor supervision of labour operations	X	X	X				X	X	X		X	X
O18	Poor leadership skills of supervisors		X		X		X		X				
O19	Poor relationship between labourers and supervisors		X		X								
O20	Poor labour management	X	X	X				X	X	X		X	X
O21	Supervisor's cognitive skills	X						X	X				X
O22	Supervisor's experience	X						X					
O23	Supervisor's absenteeism		X										
O24	Inefficient site management	X	X	X	X			X	X			X	X
O25	Poor site coordination	X		X	X			X	X	X		X	X

(*continued*)

Table 2.

Code	Organisational elements	Past studies from different countries											
		India	Indonesia	Iran	Nigeria	Palestine	South Africa	Sri Lanka	Trinidad and tobacco	Turkey	Turkmenistan	Vietnam	Zimbabwe
O26	Poor performance evaluation of labour skills				X			X					
O27	Poor resource management	X	X					X	X			X	X
O28	Lack of communication and cooperation between the parties		X		X	X		X	X			X	X
O29	Lack of periodic meeting with labourers	X	X		X			X	X			X	X
O30	Unclear instructions to labourers		X		X			X	X			X	X
O31	Enterprise failure					X	X		X				X
O32	Decision making	X											
O33	Supply chain management	X											
O34	Ethical behaviour of managers	X				X		X					
O35	Management policies and procedures	X											X
O36	Communication problems with foreign workers					X		X					

(*continued*)

Table 2.

Code	Organisational elements	Past studies from different countries											
		India	Indonesia	Iran	Nigeria	Palestine	South Africa	Sri Lanka	Trinidad and tobacco	Turkey	Turkmenistan	Vietnam	Zimbabwe
O37	Lack of transportation facilities							X					
O38	Lack of industrial research on construction labour operations					X		X					
O39	Lack of medical care facilities	X						X					
O40	Lack of food facilities	X						X					
O41	Lack of accommodation facilities							X					

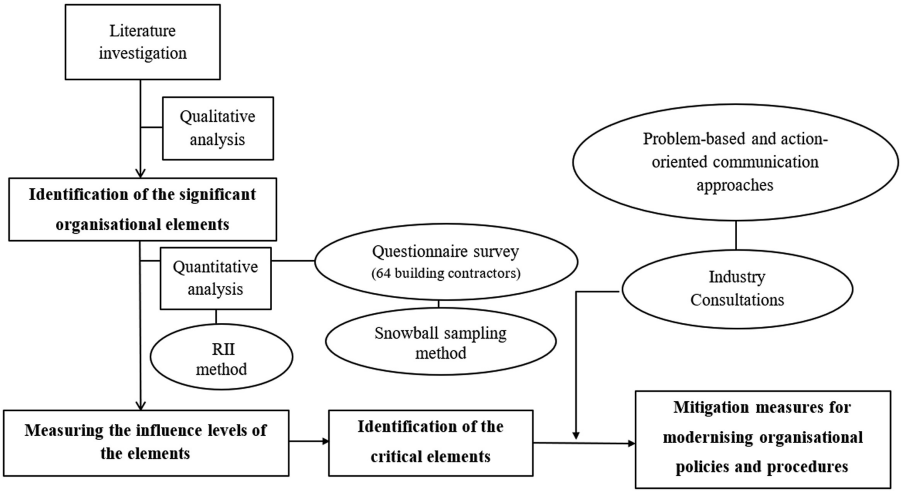

Figure 1.
Sequential process of the study methodology

The data gathered from the literature review was subjected to thematic analysis to qualitatively identify the significant organisational elements influencing labour efficiency in construction. Using a set of qualitative data, thematic analysis is a recognised method for examining respondents' perspectives, knowledge, experiences or values, as recommended by Caulfield (2019). This method was used to look at the recurring themes, topics, concepts and patterns in the data that had been gathered. A questionnaire survey was then conducted among Sri Lankan construction supervisory workers employed by 64 construction firms. A construction supervisor from each of those firms that took part in the survey responded to questions on their current organisational procedures for building construction projects. The survey questions on the elements/factors employed a Likert scale of five ordinal measurements from 1 to 5 (very low effect to very strong influence). Construction supervisors from five construction companies participated in cognitive interviews to verify the questionnaire design. These cognitive interviews led to slight changes in questionnaire designs that took into account survey participants' degree of understanding of the items included in the survey.

As suggested by Showkat and Praveen (2017), the snowball sampling technique was employed to select respondents for the questionnaire survey because it was impossible to determine the real sample size given the target criteria. During the initial round of the study, a relatively small number of well-known individual construction enterprises participated. In order to increase the sample size, the survey respondents were asked to provide names of additional potential construction supervisors who were employed by other projects or businesses, along with their contact information.

Using the relative importance index (RII) approach, the effects of the elements on the efficiency of labour activities were quantified. The RII was determined using Equation (1), as suggested by earlier studies (Kesavan *et al.*, 2015; Dinh and Nguyen, 2019).

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

Where,

W represents the weight assigned to each element 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 greater RII value demonstrates that the component has a significant impact on the efficiency of labour operations. As per the recommendations provided by earlier studies (Kesavan *et al.*, 2015; Dinh and Nguyen, 2019; Manoharan *et al.*, 2020), the lowest RII value to determine whether a given element is crucial was decided as 0.7, while the lower margin RII values for 'Moderate' and 'Low' degrees of influence were 0.5 and 0.3, respectively. The case of less than 0.3 RII scores signifies 'Very low' levels of impact. For each element, the coefficient of variation (CV) value was also determined to ensure the accuracy and validity of the findings. The ratio of standard deviation to mean data is used to define the CV value (Solly and Gezani, 2017). Here, the lower CV value shows that the respondents' values are roughly in line with the mean values. The CV values should be less than 0.3, as per the Labour Force Survey Guide 2020 of Canada (Statistics Canada, 2020), to guarantee that the results are trustworthy for the study.

To address the effects of the identified essential elements and the necessary actions that need to be taken by relevant authorities, a series of meetings and workshops were held with construction specialists from different working categories. Importantly, a total of 25 academic and industry experts participated in this, who were working as directors, project managers, engineers, quantity surveyors and institutional experts. In the discussion sessions, problem-based communication techniques were predominantly employed. These discussion outcomes confirmed the reliability of the study findings.

4. Analysis and results

Based on the respondents' CIDA grades and work experience in the building construction industry, the detailed profile of the survey respondents is presented in Table 3 below. The CIDA is a recognised organisation that offers contractors' registration in Sri Lanka. The national registration and grading scheme of CIDA classifies the contractors into 11 grades based on their financial capability, technical proficiency and work experience (Construction Industry Development Authority, 2014). Only higher-graded construction enterprises with a minimum C4 CIDA registration grade were taken into account in this survey. The minimum project investment amount for the C4 grade is 50 million Sri Lankan Rupees, as stated in the Construction Industry Development Act No.33 of 2014 (Construction Industry Development Authority, 2014). C4 grade contractors made up the largest percentage of respondents (56%).

Profile	Variables	Number of responses	Percentage
CIDA grade of contractors (X: Financial limit of the projects - LKR in million)	CS2/CS1 (X > 1,500)	00	00%
	C1 (1,500 ≥ X > 600)	08	13%
	C2 (600 ≥ X > 300)	06	09%
	C3 (300 ≥ X > 150)	14	22%
	C4 (150 ≥ X > 50)	36	56%
Experience in the construction field	Less than 5 years	00	00%
	5–10 years	35	55%
	11–15 years	18	28%
	16–20 years	04	06%
	21–25 years	05	08%
	More than 25 years	02	03%

Table 3.
Detailed profile of survey respondents

Notably, all the survey respondents had a minimum of five years of work experience in the construction industry with the majority (55%) falling between five and ten years.

Table 4 displays the mean (M), RII, standard deviations (SD), CV and the ranking (R) of organisational elements that have an impact on labour efficiency. Among those 41 elements, 28 were deemed critical since their RII values were more than 0.7. The top five ranking criteria relating to organisational practices included lack of motivation for labourers, lack of labour training facilities, poor performance evaluation of labour skills, no labour rewarding mechanism and lack of communication/cooperation between the parties. Notably, salary-related issues, poor resource management and decision-making practices were also other

Codes of causes	Mean (M)	Relative importance index (RII)	Standard deviation (SD)	Coefficient of variation (CV)	Ranking (R)	Level of impact (LI)
O9	4.66	0.93	0.15	0.16	1	Very high
O10	4.56	0.91	0.15	0.16	2	Very high
O26	4.56	0.91	0.16	0.18	2	Very high
O11	4.55	0.91	0.18	0.20	4	Very high
O28	4.48	0.90	0.17	0.19	5	High
O2	4.47	0.89	0.17	0.19	6	High
O3	4.47	0.89	0.18	0.20	6	High
O1	4.38	0.88	0.16	0.18	8	High
O27	4.36	0.87	0.15	0.17	9	High
O32	4.34	0.87	0.15	0.17	10	High
O12	4.27	0.85	0.16	0.19	11	High
O14	4.27	0.85	0.15	0.18	11	High
O21	4.25	0.85	0.11	0.13	13	High
O13	4.23	0.85	0.14	0.17	14	High
O20	4.22	0.84	0.15	0.18	15	High
O25	4.22	0.84	0.14	0.17	15	High
O16	4.20	0.84	0.14	0.17	17	High
O15	4.13	0.83	0.15	0.18	18	High
O17	4.05	0.81	0.16	0.20	19	High
O18	4.03	0.81	0.17	0.21	20	High
O8	4.00	0.80	0.14	0.18	21	High
O24	3.95	0.79	0.15	0.19	22	High
O29	3.95	0.79	0.14	0.18	22	High
O30	3.95	0.79	0.15	0.19	22	High
O19	3.75	0.75	0.14	0.19	25	High
O38	3.72	0.74	0.17	0.23	26	High
O22	3.69	0.74	0.14	0.19	27	High
O33	3.56	0.71	0.16	0.22	28	High
O4	3.44	0.69	0.16	0.23	29	Medium
O5	3.39	0.68	0.13	0.19	30	Medium
O35	3.39	0.68	0.12	0.18	30	Medium
O37	3.34	0.67	0.17	0.25	32	Medium
O34	3.31	0.66	0.15	0.23	33	Medium
O23	3.27	0.65	0.12	0.18	34	Medium
O39	3.23	0.65	0.11	0.17	35	Medium
O41	3.23	0.65	0.12	0.19	35	Medium
O40	3.13	0.63	0.12	0.19	37	Medium
O6	3.05	0.61	0.12	0.20	38	Medium
O31	2.69	0.54	0.13	0.24	39	Medium
O7	1.89	0.38	0.12	0.32	40	Low
O36	1.08	0.22	0.10	0.46	41	Very low

Table 4.
Impact levels of the organisational elements on construction labour efficiency in building project operations

important elements listed within the next five. This section compares the findings of previous studies from Sri Lanka and other foreign contexts to these leading elements while also describing the causes for the current status of those elements, how those are connected to other elements and the kinds of actions necessary from the relevant organisation or authorities.

5. Discussion

According to the results, enhancing the efficiency of labour operations in building construction projects is hampered by the lack of motivation among workers. It has also had a considerable impact on how quickly construction is moving along in several other nations, such as India (Shashank *et al.*, 2014; Soham and Rajiv, 2013; Saravanan and Surendar, 2016), Nigeria (Olabosipo *et al.*, 2011; Onyekachi, 2018) and Qatar (Jarkas *et al.*, 2012). Lack of job security for workers (Dharani, 2015; Ghoddousi *et al.*, 2015; Halwatura, 2015; Mistri *et al.*, 2019), conflicting job policies (Nourhane *et al.*, 2018), lack of labour rewarding mechanisms (Windapo, 2016; Onyekachi, 2018), lack of appropriate incentives (Jarkas and Bitar, 2012; Jarkas *et al.*, 2012; Zannah *et al.*, 2017), poor promotion opportunities (Ayegba and Agbo, 2014; Ghoddousi *et al.*, 2015) and fewer welfare facilities for workers (Ayegba and Agbo, 2014; Ghoddousi *et al.*, 2015) were the main causes of the lack of labour motivation that resulted in low efficiency in construction operations. Even while earlier research (Kesavan *et al.*, 2015; Fernando *et al.*, 2016) pointed out the necessity to increase worker motivation, the current study's findings regarding the Sri Lankan construction industry confirm that the industry's businesses have not done enough to address this problem. Construction companies need to be concerned about developing organisational rules linked to benchmarking target attainment, evaluating labour performance and rewarding labour and other welfare facilities at their organisational level.

The report draws attention to the organisations' lack of interest in enhancing labour training resources in the construction sector of a developing nation like Sri Lanka. This demonstrates that the issues associated with labour skill shortage have not been adequately addressed by the appropriate authorities, which has contributed to the poor performance of labour operations in the construction industry. Numerous other nations, including India (Ghate and Minde, 2016; Mistri *et al.*, 2019), Indonesia (Adi and Ni'am, 2012), Iran (Ghoddousi *et al.*, 2015), Nigeria (Oseghale *et al.*, 2015; Okoye *et al.*, 2016; Zannah *et al.*, 2017), Qatar (Jarkas *et al.*, 2012) and South Africa (Windapo, 2016), have also reported similar situations. The calibre of the labour force and their education and training are the major determining elements in how effectively each nation's construction sector operates (Muya *et al.*, 2003). According to recent studies (Tertiary and Vocational Education Commission, 2018; Manoharan *et al.*, 2022), Sri Lankan school curricula do not adequately include issues linked to construction education. The Industry Sector Skills Council (ISSC) of Sri Lanka also discovered that many training initiatives provided by public sector organisations fall short of meeting the needs of the sector (Tertiary and Vocational Education Commission, 2018). The poor cognitive and job-specific technical skills of Sri Lankan labourers in recent scenarios were also specifically addressed by ISSC. The need to enhance the cognitive and self-management skills of Sri Lankan labourers has been highlighted by Manoharan *et al.* (2021c) through a comprehensive comparison of the work-related skills between Sri Lankan labour and other top international labour forces, including Arabian, Chinese, Korean and Malaysian. The technical skills of labourers in concreting, bar bending, plastering, tiling, welding, electrical works and equipment handling must receive special attention from construction training institutions in Sri Lanka, according to the findings of Manoharan *et al.* (2021c).

The study draws attention to the lack of systematic processes that construction companies in Sri Lanka might employ to assess labour skills on building sites. Fernando *et al.*

(2016) also mentioned the low-performance appraisal of labour skills as a critical factor affecting labour efficiency in the Sri Lankan construction industry. Construction managers, engineers and supervisory workers must be familiar with the appropriate methods and procedures for assessing the performance of labourers and rewarding labourers, as recommended by Shehata and El-Gohary (2011). Fernando *et al.* (2016) further stated that the construction management teams need to have systematic approaches for evaluating labour performance and implementing effective labour rewarding mechanisms to make wise choices on labourer hiring, training and promotion.

The study finds that the inability of parties to communicate and work together negatively impacts the development of many major construction projects in Sri Lanka. The key to effective construction management practices is managing communication, particularly when it comes to sharing clear information among project participants. Low productivity and low quality in construction works are the results of poor communication and cooperation between the parties, which lead to a variety of issues in construction operations, including inappropriate construction methods, reworks, construction delays, etc., as stated by Soekiman *et al.* (2011) and Ghate and Minde (2016). Experts discovered that communication management related elements should be emphasised in school education and other vocational training programmes after taking into account the construction management practices in the context of many developing countries. Construction companies should give careful consideration to adopting management practices that effectively address issues with communication among all kinds of construction personnel.

In order to prevent labourers' salary-related worries from slowing down construction activities, the study emphasises the significance of upgrading the current organisational policies already in place at many construction enterprises. Previous studies have stated that payment delays and poor wages for the construction labourers working in several other nations, including India (Mistri *et al.*, 2019; Murari and Joshi, 2019), Iran (Ghoddousi *et al.*, 2015; Shahab and Audrius, 2018), Nigeria (Oseghale *et al.*, 2015; Zannah *et al.*, 2017), Trinidad & Tobacco (Hickson and Ellis, 2013), Spain (Robles *et al.*, 2014), South Africa (Windapo, 2016) and Zimbabwe (Chigara and Moyo, 2014), have a major impact on the pace of building projects. Due to their financial fragility, middle-level contracting enterprises particularly experience these salary delays. Construction site workers experience low motivation and work unhappiness as a result, which encourages them to look for alternative sources of income. Earlier studies further stated that a large number of construction projects in Iran (Ghoddousi *et al.*, 2015) and Nigeria (Oseghale *et al.*, 2015) have productivity-related problems as a result of job dissatisfaction in the workforce. Strikes by workers due to their job dissatisfaction had an impact on the efficiency of labour operations in many Indonesian building projects (Soekiman *et al.*, 2011).

In Sri Lankan building construction projects, poor resource management and decision-making practices were found to be the other main obstacles to increasing labour efficiency. Recent studies revealed that the low efficiency of labour operations in numerous construction projects in Australia (Rami and David, 2014), Egypt (Nourhane *et al.*, 2018), India (Sangole and Rani, 2015; Ghate and Minde, 2016), Spain (Robles *et al.*, 2014), Vietnam (Dinh and Nguyen, 2019) and Zimbabwe (Chigara and Moyo, 2014) was mostly due to the effect of poor labour management practices. Studies have also stated that the main obstacles to the performance improvement of construction operations in Indonesia (Soekiman *et al.*, 2011), Nigeria (Onyekachi, 2018), Qatar (Jarkas *et al.*, 2012) and Trinidad & Tobacco (Hickson and Ellis, 2013) were the poor leadership abilities of construction managers. Onyekachi (2018) has emphasised the importance of enhancing the relationship between labourers and construction supervisors for an increase in construction productivity, taking into account industrial practices in the Nigerian construction sector. Considering the Sri Lankan context, past studies (Halwatura, 2015; Fernando *et al.*, 2016; Manoharan *et al.*, 2021b) also reported poor labour management practices in many construction projects. Though the productivity

of construction operations is significantly affected due to poor resource management practices, most organisations do not take adequate steps to address these issues in the Sri Lankan construction industry, as stated by Fernando *et al.* (2016). Further, Tertiary and Vocational Education Commission (2018) and Manoharan *et al.* (2021a) highlighted the need of upgrading the construction supervisory training programmes in the Sri Lankan construction industry with special attention to improving the self-management and transferable skills of construction supervisory and management level workers.

5.1 Validity and reliability of the findings

Overall, the CV values of each element guarantee the accuracy and dependability of these results. The CV values of all elements fell within the permitted range according to the range of CV values listed in the Labour Force Survey Guide 2020 of Canada (Statistics Canada, 2020), with the exception of two elements which are 'inadequate financial policies of the government (O7)' and 'communication problems with foreign workers (O36)'. The cause of these two elements' exceeding CV values can be justified. The high CV values of these elements may be impacted by the low mean values. Therefore, the results of these two elements have no bearing on the study's objectives, and the CV values do not indicate that the results of these two components were less precise than expected. Additionally, the discussion outcomes from the workshops and discussions with industry representatives ensured the authenticity of the study findings.

6. Conclusions

This study has determined the crucial organisational aspects that have an impact on labour efficiency in building construction projects based on the perspectives of construction supervisory workers. The impact levels of the elements demonstrate how much consideration must be given to each element of organisational practices in order to increase the efficiency of construction operations and move toward profitability. The study also discussed the importance of certain characteristics and how they affect the primary tasks. The significant results of this study have undergone a comparison with earlier studies in the contexts of many developing countries. The validity and trustworthiness of the overall study results have also been guaranteed using comprehensive methods. Accordingly, this study fills a knowledge gap in the construction management field related to organisational protocols, particularly in regard to how significant these elements are, how much they influence the effectiveness of construction practices, and what actions can be taken to control their effects on construction labour efficiency in the construction industry. Accordingly, the study findings are significant for modernising organisational policies and construction management practices to the current and future circumstances.

Overall, the study identifies the key areas where construction organisations must make changes to their construction management procedures in order to increase efficiency. The results show that the organisational policies of construction businesses need to be updated to strengthen the current cash flow, communication infrastructure, resource management and performance management processes. The study also emphasises the necessity of modernising current programmes for vocational training in the field of construction education. The study highlights the elements that are not fully covered in the current training programmes based on the needs of the industry sector. In order to close the gaps between the learning results of current training programmes and the expectations of the industry, the study findings will be extremely helpful to the training providers in the construction sector.

The study findings should encourage the industry sector to close the gap between management policy and work practices. This may enable the construction sector to successfully address new difficulties and secure long-term viability. The study recommends

that future studies should concentrate on enhancing labour management and supervision procedures in construction operations. The study also suggests creating efficient performance evaluation systems for the workers at construction sites, which would promote worker skill advancement, increased productivity and higher levels of job satisfaction. The impact levels of the organisational elements on construction labour productivity presented in this study are limited to the construction supervision perspectives, and these quantified influence levels may vary with the perspectives of other work categories. But, as per the outcomes of the expert's discussions and comparisons with the earlier studies, no significant differences are expected when comparing the current study results with the perspectives of other work categories. Accordingly, this limitation is not needed to consider any significant effects on the study outcomes. Although the study methods were applied to the building construction practices in the Sri Lankan setting, the study findings significantly replicate the current status and future needs of the construction practices in the context of many developing nations.

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