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Modelling the Push Factors of Sustainable Project Management Implementation in Emerging Economies: Does Firm Size Matter

[1]Andrews Kyeremeh and [2]Tetteh Francis Kamewor

[1]University of Sunderland, Faculty of Technology, School of Engineering, Sunderland, United Kingdom, [2]Department of Supply Chain and Information Systems, KNUST School of Business, Kwame Nkrumah University of Science and Technology, Kumasi, Ghana

Email: [1]Andrews.kyeremeh@research.sunderland.ac.uk, [2]kameworfrancis @gmail.com

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Abstract

Drawing insights from transformational leadership theory, this study examined the influence of leadership commitment, organizational culture, and employee involvement on the success of sustainable project management implementation in the construction industry in Ghana. The proposed model, validated using survey data from 200 senior managers, revealed that organizational culture, leadership commitment, and employee involvement play essential roles in supporting the successful implementation of sustainable project management practices, with firm size serving as a transformative mechanism that enables construction firms in the resource-constrained Ghanaian environment to reap superior benefits. These findings contribute to the project management literature, offer essential managerial guidance for construction industry leaders, and extend the frontiers of sustainable project management by elucidating the amplifying mechanisms through which leadership, culture, and employee involvement can drive the success of sustainable project management implementation.

Keywords: Sustainable Project Management, Firm Size, Construction Industry, Organizational Culture, Leadership Commitment, Employee Involvement

Introduction

The construction industry plays a significant role in various aspects of society and the economy, contributing substantially to job creation, economic growth, infrastructure development, and sustainability. However, construction operations also have serious adverse effects on the environment and human health (Emmanuel et al., 2018; Owusu Kwateng et al., 2022). In response, the government of Ghana implemented the AKOBEN Programme in 2010 to improve companies' environmental performance (Bedu-Addo et al., 2019). However, studies have shown that for three periods from 2009 to 2011, companies failed to meet the required standards, falling afoul of Dumont et al. (2017)'s earlier recommendation that

organizations adapt their sustainable practices to help them achieve economic, social and environmental goals. The environmental performance index (EPI), in which Ghana was ranked 168th out of 180 nations in 2020, attests to the generally poor management of the environment and the negative impact of industries, including mining, on the environment (Ahakwa et al., 2021). From the perspective of Kim et al. (2019), the poor environmental performance of organizations, including those in the industry, could lead to low commitment to sustainable initiatives.

Sustainable project management is a type of management strategy that has emerged in response to the demands posed by the construction industry's adverse environmental and social impacts (Chawla et al., 2018). Adopting sustainable project management has a positive impact on operations, such as lowering energy-related costs, and businesses in a range of sectors around the world are becoming more concerned about environmental damage (Ikram et al. 2021; Lin et al. 2020). Over the past decade, firms have increasingly embraced SPM practices and incorporated them into their operational procedures as a long-term environmental responsibility (Masudin 2019). SPM achieves harmony between detrimental environmental consequences, social benefits, and profit-generating activities that encourage value along the so-called triple bottom line, giving adopting enterprises a competitive advantage (Tyagi et al. 2015). To improve environmental performance, SPM is an eco-friendly principle (Diabat & Govindan 2011). The pressing challenges of climate change, resource depletion, and social inequality have compelled organizations across industries to rethink how they approach and execute projects. As a result, the concept of sustainable project management has emerged as a pivotal framework for harmonizing economic, environmental, and social considerations in project planning, execution, and completion.

This paper examines the factors that influence the successful implementation of sustainable project management practices. Beyond a mere checklist of green initiatives, sustainable project management embodies a profound shift in mindset, processes, and relationships. It necessitates the synchronization of environmental stewardship, societal well-being, and financial viability within the project management paradigm. Despite the growth of literature (Robichaud & Anantatmula, 2011; Silvius & Schipper, 2014; Silvius & Schipper, 2015; Banihashemi et al., 2017; Kivilä et al., 2017; Larsson & Larsson, 2020; Kyeremeh & Kamewor, 2023) on sustainable project management, it is still unclear what drives the success of sustainable project management. Recent reviews (Chawla et al., 2018; Armenia et al., 2019; Chofreh et al., 2019) have called on the need to empirically understand the push factors driving sustainable project management. Similarly, Shaukat et al. (2021) recommended the need to explore drivers and critical success factors for firms to implement SPM practices. Factors such as leadership commitment and values (Iqbal & Ahmad, 2021), organizational culture, employee involvement, and communication climate could be critical for SPM implementation. To date, limited or no studies have been conducted to explore how these factors direct SPM implementation.

The study makes significant contributions by empirically validating how leadership commitment, organizational culture, and employee involvement collectively drive sustainable project management (SPM) implementation in construction firms, while demonstrating the transformative role of firm size as a critical moderating factor. Drawing on transformational leadership theory, the findings reveal that a sustainability-oriented leadership approach,

when combined with a supportive organizational culture and engaged workforce, creates a synergistic foundation for effective SPM implementation. Particularly noteworthy is how firm size amplifies these relationships, suggesting that different organizational contexts require tailored sustainability strategies—with larger firms leveraging their resource advantages and smaller firms capitalizing on their agility and cultural cohesion. These insights offer practical guidance for construction industry leaders in emerging economies like Ghana, who must navigate resource constraints while implementing sustainability initiatives. By highlighting the interplay between internal organizational dynamics and structural characteristics, the study provides a nuanced framework for understanding how construction firms can successfully integrate environmental, social, and economic considerations into their project management practices, ultimately contributing to more sustainable built environments in developing regions. The paper reviews relevant literature in Section 2, outlines the methodology in Section 3, presents and discusses the data analysis in Section 4, and concludes with limitations and future research suggestions.

Theoretical Review and Hypotheses Development

Transformational Leadership Theory

Several organizational and management theories, such as transformational leadership theory, may help explain the relationships between leadership commitment, organizational culture, employee participation, and the implementation of sustainable project management practices (Susanto et al., 2023; Azhar & Yang, 2022; Katper et al., 2020; Busari et al., 2019). Transformational leadership theory suggests that leaders committed to a sustainability-oriented vision can inspire and motivate employees, fostering a culture that supports the effective adoption of sustainable project management (Althnayan et al., 2022; Lăzăroiu et al., 2020). By integrating these concepts, researchers can gain insights into how leadership, culture, and employee involvement collectively influence the successful implementation of sustainable project management. Transformational leadership theory suggests that leaders committed to a sustainability-oriented vision can inspire and motivate employees, fostering a culture that supports the effective implementation of sustainable project management practices (Zaman et al., 2020; Cuong et al., 2023; Villena and Gioia, 2020). Transformational leaders promote employee participation by cultivating a shared vision and empowering workers to contribute to long-term sustainability goals (Zaman et al., 2020). They link their leadership approach with the values of environmental stewardship and social impact, which shapes an organizational culture that enables employees to freely adopt sustainable practices (Cuong et al., 2023). A strong organizational culture that prioritizes sustainability is crucial for integrating these practices into day-to-day project management procedures (Çop et al., 2021; Stanitsas et al., 2021; Obradović et al., 2019; Larsson and Larsson, 2020). When transformational leadership, organizational culture, and high employee involvement align, it creates an environment where sustainability is deeply embedded within the organization's principles and processes. This research advances knowledge by illustrating how the interplay of these factors can vary depending on firm size, as shown in the conceptual framework in Figure 1.

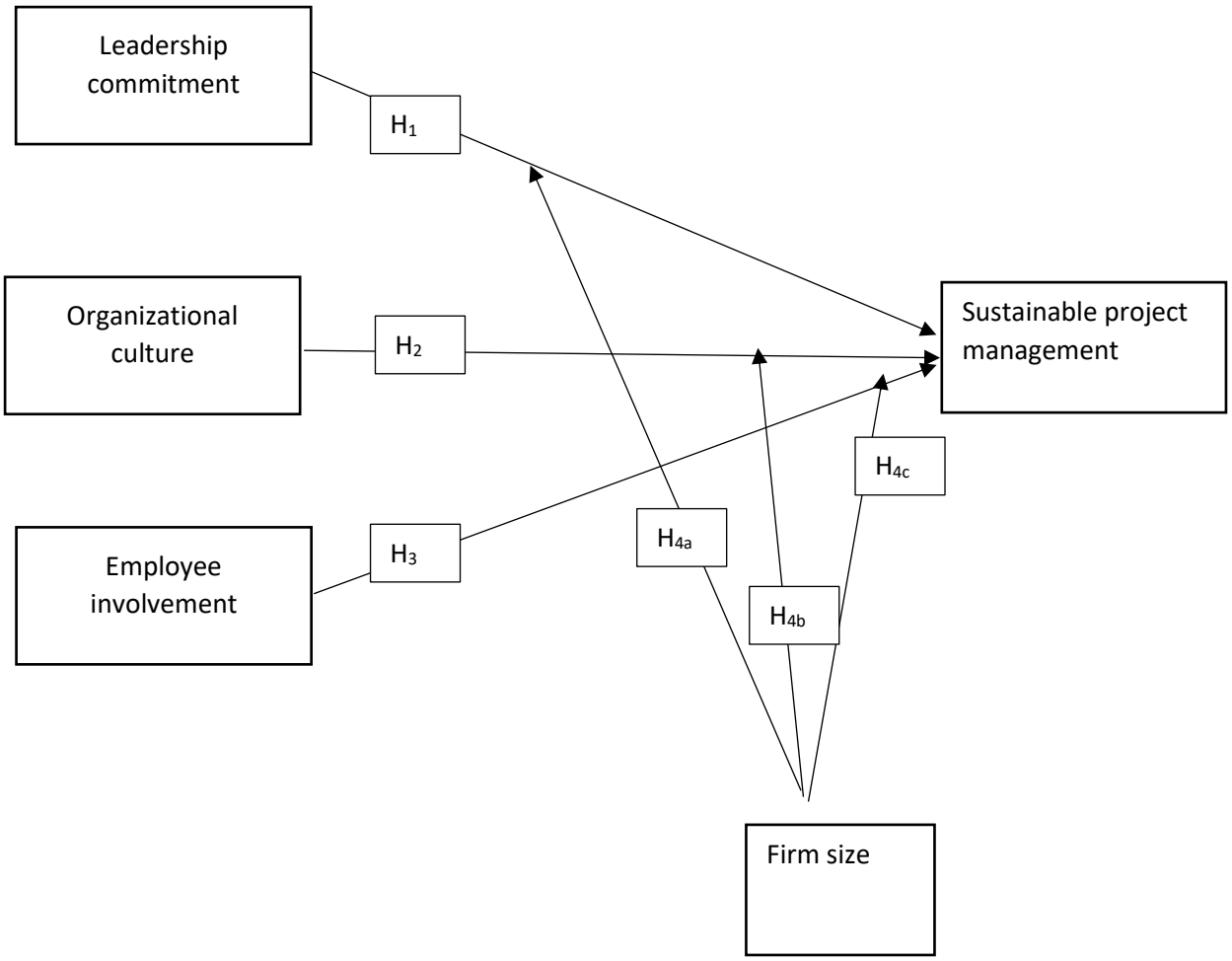

Figure 1: Proposed Research Model

Hypotheses Development

Leadership Commitment and Sustainable Project Management

Sustainable project management (SPM) is an approach that seeks to integrate environmental, social, and economic considerations into the planning, execution, and evaluation of projects (Siangchokyoo et al., 2020). According to Afriyie et al. (2019), leadership commitment is a crucial factor in ensuring the success and sustainability of project management initiatives. Leadership commitment is a critical element in the success and effectiveness of any organization or initiative (Kusi et al., 2021). Leadership commitment is a critical factor in sustainable project management, particularly when viewed through the lens of transformational leadership theory (Stanitsas et al., 2021). Transformational leaders inspire and motivate their teams by fostering a shared vision, encouraging innovation, and promoting a sense of purpose. In the context of sustainable project management, a leader's commitment to environmentally and socially responsible practices is crucial for long-term success (Kineber et al., 2023). Empirical studies have consistently demonstrated that organizations led by transformational leaders exhibit higher levels of sustainability performance (Shaukat et al., 2022; Ullah et al. (2020). For instance, research by Piyathanavong et al. (2022) found a positive correlation between transformational leadership and organizational innovation, a key element in sustainable project management. Thus, leadership commitment, rooted in transformational leadership theory, not only defines the direction of a project but also influences its sustainable outcomes, as supported by empirical evidence highlighting the

positive impact of transformational leadership on sustainable practices. Based on the aforementioned argument, a hypothesis is proposed that:

H_1: Leadership commitment has a significant positive effect on sustainable project management

Organizational Culture and Sustainable Project Management

Sustainable project management (SPM) is an approach to project management that integrates principles of sustainability into the planning, execution, and evaluation of projects (Windapo (2023). Mukhtar and Iqbal (2023) stated that organizational culture plays a significant role in the success and implementation of SPM initiatives. Organizational culture refers to the shared values, beliefs, behaviours, and norms that shape how people within an organization interact with each other and external stakeholders (Oke et al., 2023). Jabbour et al. (2020) discovered that organizational culture plays a pivotal role in shaping the success of sustainable project management, particularly when aligned with transformational leadership theory. The organizational culture encompasses shared values, beliefs, and behaviours within a workplace, influencing how projects are conceived and executed (Sardana et al., 2020). Transformational leaders, through their inspirational and visionary approach, can shape and reinforce a culture that values sustainability. Research by Ershadi et al. (2021) suggests that a culture characterized by adaptability, mission clarity, and employee involvement, which are often fostered by transformational leaders, is positively associated with sustainable project outcomes. Olawumi and Chan (2019) concluded that the alignment of organizational culture with transformational leadership principles creates an environment where sustainability becomes an integral aspect of project management rather than a peripheral consideration. Consequently, the integration of a sustainability-oriented culture under transformational leadership enhances the likelihood of successful and enduring sustainable project management practices, as supported by empirical evidence linking transformational leadership and positive organizational cultures to sustainable project outcomes. Given the preceding discussion, the study proposes the hypothesis that:

H_2: Organizational culture has a significant positive effect on sustainable project management

Employee Involvement and Sustainable Project Management

Sustainable project management (SPM) is an approach to managing projects that integrate principles of sustainability into all aspects of project planning, execution, and evaluation (Yadav et al., 2019). Employee involvement is a critical factor in the success of SPM initiatives. Employee involvement refers to the degree to which employees actively participate in decision-making processes, contribute ideas, and take an active role in the affairs of the organization (Ramohlokoane et al., 2022). Adabre and Chan (2019) emphasized that employee involvement is a crucial factor in the realm of sustainable project management, particularly when considered in conjunction with transformational leadership theory. Yadav et al. (2020) indicated that employee involvement encompasses the active participation of team members in decision-making processes and project activities. Jabbour et al. (2020) observed that transformational leaders, by fostering a collaborative and inclusive environment, promote higher levels of employee involvement. According to Sardana et al. (2020), the Social Exchange Theory when employees feel valued and engaged, they are more likely to reciprocate with increased commitment and effort. Nurwulandari (2021) found a positive relationship between transformational leadership, heightened employee

involvement, and improved project outcomes. Hence, this connection is pivotal in the context of sustainable project management, as engaged and involved employees are more likely to embrace and contribute to sustainable practices within the project, ultimately leading to greater success in achieving long-term environmental and social objectives. Based on the aforementioned argument, a hypothesis is proposed that:

H_3: Employee involvement has a significant positive effect on sustainable project management

The Moderating Role of Firm Size on the Relationship Between Leadership Commitment and SPM Implementation

Firm size is a measure of the scale or magnitude of a business organization, typically assessed using various metrics such as the number of employees, annual revenue, market share, total assets, or other relevant indicators (Wang et al., 2019). Ngan et al. (2019) stated that the relationship between leadership commitment and the implementation of sustainable project management is contingent upon firm size, revealing a moderating effect. Armenia et al. (2019) assumed that leadership commitment rooted in transformational leadership theory reflects the dedication of leaders to inspire and motivate their teams towards sustainability goals. Bag et al. (2021) indicated that the moderating influence of firm size acknowledges that the impact of leadership commitment on sustainable project management may vary across different organizational scales. Empirical evidence, as highlighted in studies like Wang et al. (2019), indicates that the effectiveness of transformational leadership may be more pronounced in smaller firms, where the leader's influence is more direct and immediate. Larger firms, on the other hand, may require additional structural adaptations to fully realize the benefits of leadership commitment in sustainable project management. This nuanced understanding of the interplay between leadership commitment, firm size, and sustainable project management contributes to a more tailored and effective approach to implementing sustainability initiatives based on organizational characteristics. Based on the aforementioned argument, a hypothesis is proposed that:

H4a: Firm size moderates the relationship between leadership commitment and sustainable project management

The Moderating Role of Firm Size on the Relationship Between Organizational Culture and SPM Implementation

Cantarero (2020) stated that the moderating role of firm size on the relationship between organizational culture and sustainable project management (SPM) underscores the importance of considering organizational characteristics in sustainability initiatives. Organizational culture, representing shared values and behaviours within a workplace, significantly influences how sustainability practices are embraced. Transformational leadership theory provides a lens through which leadership fosters a culture supportive of sustainability. Empirical evidence, such as research by Adabre & Chan (2019), suggests that the impact of organizational culture on SPM may be more pronounced in smaller firms where cultural norms are more directly influential. Larger organizations, due to their complexity, might require more extensive adaptations to integrate a sustainability-oriented culture. Hence, recognizing the moderating effect of firm size facilitates a more nuanced and tailored approach to aligning organizational culture with SPM, emphasizing that interventions should be attuned to the unique dynamics of different-sized firms for optimal sustainability outcomes. Based on the aforementioned argument, a hypothesis is proposed that:

H4b: As firm size increases the relationship between organizational culture and sustainable project management amplifies

The Moderating Role of Firm Size on the Relationship between Employee Involvement and SPM Implementation

Olawumi and Chan (2019) noted that the interplay between employee involvement and sustainable project management (SPM) implementation is contingent upon firm size, revealing a moderating effect that underscores the importance of organizational context. Employee involvement, representing the active participation of team members in project activities, is integral to successful SPM. Transformational leadership theory, known for fostering a collaborative environment, serves as a theoretical foundation for understanding how leaders can enhance employee involvement. Empirical evidence, as demonstrated in studies like Yadav et al. (2020), highlights the positive association between transformational leadership, heightened employee involvement, and improved project outcomes. Oke et al. (2023) indicated that the moderating role of firm size suggests that the impact of employee involvement on SPM may differ across organizational scales. Olawumi and Chan (2019) noted that smaller firms might benefit more directly from increased employee participation due to their streamlined structures, while larger organizations may require tailored strategies to leverage the potential of employee involvement. Hence, this nuanced understanding emphasizes the need to consider firm size when designing interventions for SPM, ensuring that employee involvement practices align optimally with the organizational context for sustainable project success. Based on the aforementioned argument, a hypothesis is proposed that:

H4c: The larger the firm, the effect of employee involvement on sustainable project management
increase

Material and Methods

This section details the methodology of the research including the research design and survey questionnaire, sample size determination and sample selection procedure, data collection, and test for biases and method of data analyses.

Research Design and Instrument Development

The study applied a cross-sectional quantitative survey design and used a self-administered questionnaire to collect quantifiable data from selected staff of construction firms in Ghana. A survey questionnaire was utilized as it is inexpensive, less time-consuming and can provide data from a large research sample (Mbima & Tetteh, 2023). The questionnaire was developed based on literature reviews and in-depth consultations with practising project management or construction in public and private sector organizations. Guided by these, questions were compiled on constructs under study: leadership commitment, organizational culture, employee involvement and sustainable project management with modifications in wording to fit the empirical study context. Leadership commitment was measured using six (6) items sourced from previous studies (Griffith, Yalcinkaya, & Calantone, 2010; Colwell & Joshi, 2013; Wijethilake and Lama, 2019). Organizational culture was also measured using five (5) items sourced from (Ali et al., 2023) and sustainable project management implementation was measured using nine (9) items sourced from (Kivilä, et al., 2017; Shaukat et al., 2021).

Employee involvement was measured using eleven (11) items sourced from (Richardson & Vandenberg, 2005). All the items measuring the constructs were measured using a 5-point Likert scale question. Firm size on the other hand was measured by the level of investment of the firm. The size of the firm was classified under two groups: investment ≤ GH ¢100, 000 and investment ≥ GH ¢100, 000. The study further included ownership type as a covariate in the model. Ownership type was grouped under three classes: locally owned, foreign-owned and joint ownership. The questionnaire was pre-tested on 10 contractors and project managers of construction firms, for clarity and completeness. Feedback received during the subsequent review of the questionnaire was incorporated into the final version of the questionnaire.

Study Sample

Empirical analyses are based on 200 valid responses from construction firms in Ghana. The study population comprised of 2714 registered construction firms in Ghana (GoG Contractor List, 2021). According to Krejcie & Morgan (1970), for a study population of 250 PDEs, a sample of 152 PDEs is appropriate. This implies that for a study population of 2714, a sample of 338 firms is adequate. For this study, 350 questionnaires were administered considering the low response rate of previous studies. After thorough screening, 200 cases were found valid and suitable for analysis. Hence, for this study, a sample of 200 was used. The Kaiser-Meyer Olkin (KMO) test (Kaiser, 1981; Kaiser & Rice, 1974) result is 0.845 indicating that the sample is adequate and that the data is sufficient.

Data Collection

Survey data was collected in a single wave, from September to November 2023. The study used the 'drop-off and pick-up' method (Allred & Ross-Davis, 2011) to ensure effectiveness and efficiency in questionnaire distribution and obtaining completed questionnaires from the respondents. Responses were sought from senior and experienced staff in the firm who participate in construction and project management, including project officers, contractors and/or (senior) procurement officers, engineers and staff that have projects in the past, as these were deemed knowledgeable about the sustainable project management implementation that occurred in their firm and would provide rich information concerning the research variables under investigation. The sample was predominantly male (69.9%), with the majority of participants (38.2%) falling within the 21-30 years age group, while those aged 51 and above comprised the smallest proportion (5.6%). In terms of education, the majority (35.7%) held a first degree, while those with other qualifications (10.0%) and PhDs (10.3%) were less represented. Regarding work experience, the largest group (36.2%) had been in their current position for 2-5 years, while only 3.6% had held their position for 16 years or more. Similarly, the majority (39.8%) had worked at their firm for 6-10 years, while those with 16+ years of firm tenure made up the smallest proportion (6.1%). Finally, the sample was dominated by firms with more than 16 years of operation (54.0%), while those with less than 2 years of experience represented the smallest proportion (2.5%).

Survey and Common Method Bias

The researchers thoroughly examined the data for outliers and missing values. Missing values were treated using the expectation maximization method, and the absence of outliers was confirmed using graphical presentation and Mahalanobis distance calculations (Hair et al., 2014). To check for non-response bias, the characteristics of responding and non-responding firms were compared, and no significant differences were found. Additionally, early and late

responses were analyzed, and a t-test revealed no significant differences, further confirming the absence of non-response bias (Clottey & Benton, 2013; Greco et al., 2015). The researchers also implemented methodological remedies to minimize survey bias, such as explaining concepts to participants and ensuring anonymity to reduce social desirability bias (Podsakoff et al., 2012; Baumgartner & Weijters, 2012). Common method bias was assessed using the total variance explained, where the highest variation explained by a single component was below the 50% threshold (MacKenzie and Podsakoff, 2012). The researchers also employed the Partialing Out of General Factor technique in the PLS model, which confirmed that common method bias was not a significant issue in this study (Reio, 2010; Tehseen et al., 2017).

Data Analysis and Results

The proposed hypotheses were subjected to rigorous evaluation through the use of several analytical techniques and strategies, ensuring the consistency of the estimations. The software program SPSS version 26 was employed for conducting exploratory factor analysis (EFA), whereas Amos was utilized to conduct confirmatory factor analysis (CFA). The structural model underwent evaluation through the utilization of both structural equation modelling (SEM) and PROCESS. The Structural Equation Modelling (SEM) technique, being a second-generation method, offers the benefit of concurrently modelling causal links among several types of variables. The Covariance-Based Structural Equation Modelling (CB-SEM) test is primarily concerned with assessing the adequacy of a model on the available data. Its primary objective is to minimize the disparities between the covariance matrices derived from observed variables and those predicted by the model. In this study, we employ both exploratory factor analysis and confirmatory factor analysis (CFA) to evaluate the measurement model and ascertain the reliability and validity of the constructs. Next, the author proceeds to ascertain the causal association between variables, commonly referred to as the structural model (Sarstedt et al., 2020). The appropriateness of measurement fitness is demonstrated by its ability to encompass several factors, such as sample size, proportion variance, and covariance matrices. Additionally, it underscores the conventional practice of assessing all latent components and verifying the validity of the items (Awang et al., 2015).

Assessment of Reliability and Validity

After all the preliminary checks, we assessed both univariate and multivariate normality assumptions to assess the distribution of the dataset using SPSS and we found that all the skewness and kurtosis indices were within the range of -2 and +2, as recommended by Kline (2011). The results provide evidence that the data used in this study does not suffer from normality problems. Even though all the items used for measuring the constructs in our model were adapted from previous studies, we conducted EFA to ascertain the unidimensionality and structure of the dataset. A multi-item indicator EFA was examined using principal component analysis (PCA). The varimax rotation procedure was used. Bartlett's test showed a significant output (χ^2 = 7741.914, df: 496, p 0.000), while the results of the Kaiser-Meyer-Olkin's measure of sampling adequacy were 86.9%. The results confirm the factorability and the validity of the sampling strategy (Hair et al., 2019). The factor analysis results indicated that four factors were extracted with eigenvalues greater than 1, explaining between 10.761% and 33.500% of the variance. The items loaded perfectly on their respective constructs. The researchers further employed confirmatory factor analysis to evaluate scale validity and reliability. They retained items with factor loadings above 0.7, resulting in the deletion of two

items each for leadership commitment and sustainable project management implementation. The retained items demonstrated acceptable Cronbach's alpha, composite reliability, and average variance extracted, indicating scale reliability, unidimensionality, and convergent validity (Bagozzi & Yi, 2012; Hair et al., 2019). The measures also exhibited discriminant validity, as the shared variances were lower than the construct values. Additionally, the VIF values were within the acceptable range, indicating no multicollinearity issues. The overall model fit was adequate, with the chi-square, RMSEA, TLI, and CFI indices meeting the recommended thresholds (Bagozzi & Yi, 2012; Hair et al., 2014).

Table 1
Reliability and Validity

Constructs	**Items**	**Loadings**	**CA**	**CR**	**AVE**
Leadership Commitment	LC6	0.777	0.801	0.817	0.763
	LC4	0.721			
SPM Implementation	SPMI4	0.841	0.906	0.916	0.874
	SPMI3	0.893			
	SPMI2	0.843			
	SPMI1	0.846			
Organizational Culture	OC5	0.952	0.956	0.961	0.869
	OC4	0.832			
	OC3	0.961			
	OC2	0.761			
Employee Involvement	EI11	0.883	0.955	0.964	0.711
	EI10	0.907			
	EI9	0.921			
	EI8	0.860			
	EI7	0.897			
	EI6	0.898			
	EI5	0.892			
	EI4	0.769			
	EI3	0.753			

Table 2
Discriminant Validity

Constructs	**1**	**2**	**3**	**4**
Employee Involvement	**0.873**			
Leadership Commitment	0.689	**0.935**		
Organizational Culture	0.750	0.800	**0.932**	
Sustainable Project Management Implementation	0.714	0.862	0.834	**0.843**

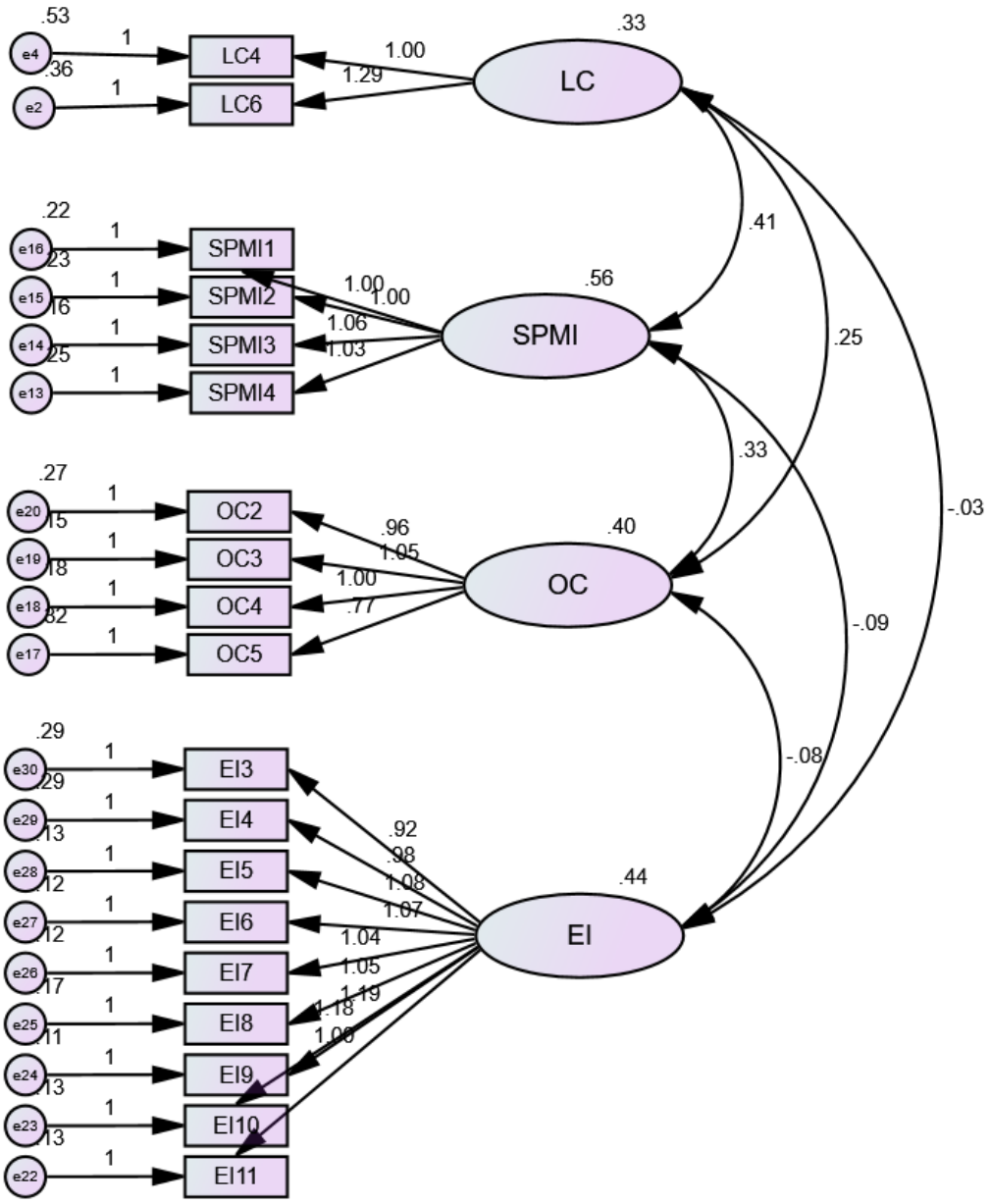

Figure 2 Measurement Model Assessment

Model Testing

The researchers used the PROCESS macro developed by Hayes (2018) to test the moderating role of firm size on the relationships between the push factors (leadership commitment, organizational culture, and employee involvement) and sustainable project management (SPM) implementation. The results showed that the push factors significantly drive SPM implementation (H1a: $\beta = .2440$, $p < 0.01$; H1b: $\beta = .3068$, $p < 0.01$; H1c: $\beta = .2673$, $p < 0.01$), and firm size also has a significant direct effect on SPM implementation ($\beta = .4044$, $p < 0.01$). Importantly, the researchers found that firm size significantly moderates the relationships between the push factors and SPM implementation (H2a: $\beta = .0844$, $p < 0.01$; H2b: $\beta = .0691$, $p < 0.01$; H2c: $\beta = .0590$, $p < 0.01$), suggesting that the combination of the push factors and firm size is crucial in driving the implementation of sustainable project management practices.

Table 3
Structural Model

	Dependent Variable		
	Model 1	**Model 2**	**Model 3**
	Coeffic. (p)	***Coeffic. (p)***	***Coeffic. (p)***
Control			
Ownership type	.2614***(.0017)	.2537***(.0024)	.2439***(.0052)
Main Effect			
LC	.2440***(.0000)	.3903***(.0000)	.3764***(.0000)
OC	.3068***(.0002)	.2299*(.0668)	.5531***(.000)
EI	.0699(.1089)	.0632(.1656)	.2673***(.0019)
FS	.4044***(.0000)	.3602***(.0033)	.2230**(.0143)
Interaction Effect			
LC*FS	.0844***(.0000)		
OC*FS		.0691***(.0024)	
EI*FS			.0590***(.0095)
Model Summary			
R2	0.8200	0.8053	0.8034
F-test	184.5581	167.563	165.4562
P-Value	0.0000	0.000	0.0000

*** p<.01, ** p<.05, * p<.1

Discussion of Results Findings and Implications

The study set out to model the push factors that drive sustainable project management (SPM) implementation in the context of emerging economies, considering the moderating role of firm size. The findings showed that leadership commitment, organizational culture, and employee involvement are significant drivers of SPM implementation in the construction sector. Leadership is critical in setting the tone for sustainability initiatives, as committed leaders can promote the importance of sustainability, allocate resources, and define clear targets to enable successful SPM implementation (Dyer & Dyer, 2017; Farrukh et al., 2022). Additionally, an organizational culture that prioritizes sustainability can shape employee attitudes and behaviors, making them more likely to actively engage in SPM activities (Nazir et al., 2019). Employee engagement, in turn, has been consistently linked to the effective implementation of sustainable practices, highlighting the importance of involving employees in sustainability decision-making and promoting their active participation to generate innovative solutions (Pitchot, 2020; Raza et al., 2021; Singh & Chan, 2022).

The study found that firm size significantly moderates the relationships between the push factors (leadership commitment, organizational culture, and employee involvement) and the implementation of sustainable project management (SPM). This suggests that the combination of these push factors and firm size is crucial in driving SPM implementation in construction firms. Larger firms tend to have greater resources and capacities to invest in sustainability activities, leading to more noticeable impacts from leadership commitment on SPM implementation (Amores-Salvado et al., 2021; Li et al., 2020). Conversely, smaller firms may find it easier to cultivate a unified organizational culture that aligns with sustainability, potentially leading to a stronger influence of culture on SPM (Pennington, 2022; Howard-Grenville, 2014). Additionally, the tighter-knit workforce in smaller firms can facilitate greater employee involvement in sustainability initiatives, enhancing their impact on SPM implementation (Thomas, 2020; Dastbaz & Gorse, 2016). These findings highlight the

importance of considering the interplay between the push factors and firm size when seeking to promote the adoption of sustainable project management practices.

Conclusion

This study highlights the critical importance of leadership commitment, organizational culture, and employee engagement in driving the implementation of sustainable project management (SPM) practices within the construction industry. These internal motivating factors work synergistically to enable the effective integration of sustainability principles into construction initiatives. However, the study also emphasizes the significant moderating influence of firm size, indicating that smaller and larger construction firms may face differing challenges and opportunities in their pursuit of SPM. As such, construction organizations must recognize the importance of these push factors and tailor their strategies accordingly, while also cultivating a culture of sustainability in project management. By doing so, construction firms can not only enhance their environmental and social responsibilities, but also position themselves as pioneers in the growing landscape of eco-friendly building practices, benefiting both their projects and the broader society. This paper underscores the pivotal roles of leadership commitment, organizational culture, and employee engagement in driving sustainability performance management (SPM) implementation within the construction industry. These factors synergistically facilitate the effective integration of sustainability principles into construction practices. However, the study also highlights the nuanced impact of firm size, indicating that smaller and larger firms encounter unique challenges and opportunities in adopting SPM practices. Construction firms must recognize these internal dynamics and customize their strategies according to their specific organizational contexts while fostering a culture of sustainability in project management. By doing so, construction firms can enhance their environmental and social responsibilities, positioning themselves as leaders in the increasingly important realm of eco-conscious construction practices, benefiting both their projects and society at large.

Contributions

This study makes two valuable contributions to the literature. First, it empirically validates how leadership commitment, organizational culture, and employee involvement individually influence the implementation of sustainable project management (SPM) practices. Second, it extends knowledge by demonstrating the varying conditions under which these factors impact SPM, as influenced by firm size. In terms of practical implications, the findings underscore the crucial role of leadership in driving sustainability initiatives by setting the organizational tone. Construction firms should focus on leadership development programs that emphasize the importance of sustainability. Additionally, cultivating an organizational culture that prioritizes sustainability norms and behaviors is essential for aligning SPM with the firm's values. Actively engaging employees in sustainability practices is also vital, as their frontline involvement can lead to innovative solutions. However, the moderating effect of firm size adds nuance, as smaller firms may face resource constraints, while larger firms may grapple with coordination challenges across diverse project teams. Therefore, construction companies must tailor their sustainability strategies to their unique organizational context, while recognizing the overarching importance of leadership commitment, organizational culture, and employee participation in implementing effective SPM practices.

Limitation and Future Research Direction

A key limitation of this study is its focus on construction firms in Ghana, which may restrict the generalizability of the results to other geographical contexts with potentially diverse contextual factors. Future research should undertake comparable studies in different settings to gain a more comprehensive understanding of the relevance of leadership commitment, organizational culture, and employee participation in sustainable project management (SPM) implementation. Additionally, while this study examined the perspectives of senior managers, future research could explore the views of employees at various organizational levels to provide a more holistic picture of the factors impacting SPM implementation. Furthermore, the study concentrated on the direct relationships and the moderating effects of firm size; future research should delve deeper into the underlying mechanisms by investigating potential mediating factors that facilitate or hinder the implementation of SPM practices. Such an approach would help build a more nuanced knowledge of how construction firms can successfully integrate sustainable practices into their projects.

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