

# The Performance Implications of Sustainable Project Management in Emerging Economies: Does Operational Excellence Matter

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## Abstract

While it is expected that sustainable project management may enhance construction project success, the mechanisms and conditions under which sustainable project management may enhance project success is less understood. Drawing insights from the natural resource based view and survey data from 200 senior managers of construction firms in Ghana, we found support for the argument that sustainable project management is important in the quest to improve project success. Our findings also suggest that operational excellence does not just influence project success but serves as a transformative mechanism to reap superior success of construction projects in the resource constrained environment. Our findings make contemporary contribution to project management literature as well as important managerial guidance for managers in the construction space in resource constrained regions like SSA. The outcome of this study offers an important extension to the frontiers of sustainable project management literature. It also provides practical insight to practitioners in the construction setting by emphasizing the need to pay crucial attention to operational excellence as well as encouraging the acceptance of sustainable project management in the quest to reduce construction project failures.

## Introduction

Project success (PS) is a subjective, ambiguous, multidimensional, and subtle concept (Belassi & Tukel, 1996; Ika, 2009). Increasingly, sustainability integration of social, environmental, and economic issues is viewed as one of the critical factors for project acceptance and success (Chen et al., 2019; Shah et al., 2020; Toljaga-Nikolic et al., 2020). Rising competitive pressures, rapid technological advancements, and stringent government regulations on social and environmental standards are increasingly propelling firms to embrace sustainable business practices (Caffaro et al., 2019; Toljaga-Nikolic et al., 2020). In addition, factors such as growing public awareness of pressing sustainability issues and changing client expectations around

these issues are continuously putting companies under intense pressure to take leadership in sustainability and deliver projects with improved environmental and social impacts (Adriana & Maria, 2013; Darko et al., 2017; Moehler et al., 2018). For instance, Larson et al (2018) posited that the threat of global warming and climate change has brought sustainability to the fore. Accordingly, it is argued that SPM has become an increasing focus for project management (Hasheminasab et al., 2020; Pinto, 2020) and emerging literature suggests that PS is largely determined by how well firms manage and integrate critical sustainability issues at various stages of the project life cycle (Carvalho & Rabechini, 2017; Hasheminasab et al., 2020; Ismayilova & Silvius, 2021; Larsson & Larsson, 2020; Olawumi & Chan, 2019; Silvius & Schipper, 2015; Wozniak, 2021; Yazici, 2020). Despite the growing relevance of sustainability in the project management discipline, the recognition of SPM has only recently attracted scholarly attention. This is because SPM has become a new school of thought in the project management literature (Silvius, 2017). At the same time, a large majority of companies are aligning their projects' work assignments with the principles of sustainability to accomplish sustainable outcomes (Aguilar-Fernández et al., 2015; Shang et al., 2020; Silvius et al., 2013; Silvius & Schipper, 2014). The emergence of sustainability in the project management discipline has been widely acknowledged in an increasing number of recent research publications (Carvalho & Rabechini, 2017; Chawla et al., 2018; Malik et al., 2020) suggesting that SPM is a significant source of PS (Adriana & Ioana-Maria, 2013; Carvalho & Rabechini, 2017; Dubois & Silvius, 2020; Ebbesen & Hope, 2013; Khalifeh et al., 2019; MartínezPerales et al., 2018; Silvius & Schipper, 2015; Yazici, 2020). Nevertheless, there is ample room for further research to develop an improved understanding of the SPM and PS relationship and the underlying mechanisms that influence this relationship (Aarseth et al., 2017; Brones et al., 2014; Chofreh et al., 2019; Dubois & Silvius, 2020; Khalifeh et al., 2019; Martens et al., 2016). In addition, most of the prior studies on SPM and PS were conducted in the developed world context (Carvalho & Rabechini, 2017; Dubois & Silvius, 2020; Goel et al., 2019; Larsson & Larsson, 2020; Martens & Carvalho, 2016; Martínez-Perales., 2018; Stanitsas et al., 2020; Yazici, 2020) while there is a dearth of empirical research looking at the relationship between SPM and PS in developing countries (Shaukat et al., 2021). With few exceptions (e.g., Malik et al., 2020; Ullah et al., 2020), there is a lack of comprehensive understanding of how sustainability is practiced in the Ghanaian project management context and to what extent firms are embracing the SPM approach. Sustainability is an emerging phenomenon in sub-Saharan Africa and most recent studies revealed that firms are in the early stages of sustainability adoption. Mahmood et al (2019) demonstrated that inadequate regulation, lack of awareness and interest around sustainability issues, and lack of capability are some of the main drivers for sustainable reporting practices. Ahmad et al (2021) revealed that sustainability adoption in SME sector is fragmented and in particular, the environmental dimension is the least practiced sustainability aspect in the SME sector. Ullah et al (2020) also revealed that the environmental dimension is considered an important issue, while social sustainability aspects are mostly ignored by construction companies. In addition, the results further indicated that the construction sector is facing several challenges at policy and operational levels while implementing sustainability. Accordingly, it is worthwhile to examine the current state of SPM implementation in developing economies, which provides fresh insights for the SPM body of knowledge from a developing country's perspective. Prior research has mostly focused on assessing the direct relationship between SPM and PS (Carvalho & Rabechini, 2017; Ebbesen & Hope, 2013; Martens & Carvalho, 2016; Mavi & Standing, 2018; Silvius et al., 2017; Silvius & Schipper, 2015). However, it has failed to identify

key mechanisms through which the relationship can be enhanced and strengthened. Joslin and Müller (2015) recommended incorporating some moderating variables to investigate the relationship between SPM and PS.

Responding to this call, this study bridges the gap by introducing operational excellence as a moderator. Prior studies have cited operational excellence critical for “putting sustainability on the agenda” Akanmu et al (2022) and therefore the importance of these issues cannot be ignored concerning effective management of projects and delivering successful project outcomes. Additionally, the inconsistency in the past literature has called for a need to align managerial solutions and specific industry characteristics toward excellence to improve sustainability when making a decision. To achieve organizational excellence is the main aim of innovative and quality management implementation. Likewise, Jankalová and Jankal (2020) revealed that the main basis to achieve business excellence is to respect the core principles of sustainable project management and that there is a relationship between business excellence and sustainability which is identified through mutual core values. Managers require sustainable excellence to have a clear mission that leads a team of an organization to achieve goals by managing the organization for stakeholders and customers and delivering values. Excellence is the highest level and the most outstanding performance; therefore, it should be a matter of concern to any organization (Antony & Bhattacharyya, 2010). Organizations that maintain excellence have a positive impact on the world economy by enhancing their performance while advancing social and environmental sustainability within the communities they touch (Akanmu & Bahtiar, 2021; Jankalová & Jankal, 2020). Nowadays, in achieving a high record of performance, many organizations must struggle first in achieving organizational excellence in order to stand out from other competitors in the market. Many organizations have differed strategies, the plan to achieve business excellence. Generally, one of the critical strategies to improve an organizational positioning in a market is sustainable project management. This study is therefore conducted to address two important but less discussed issues in project management. (1) Till date very little or no study has been conducted to examine how project success could be achieved via sustainable project management. (2) The when and how project success and sustainable project management relationship occurs is also yet to receive empirical attention. This study fills the gap by examining the moderating role of operational excellence on sustainable project management and project success within the construction sector an emerging economy in sub-Saharan African region.

The outcome of this study makes a twofold contribution. First, this study is the few attempts to empirically validate how project success could be achieved via sustainable project management. Second, the study pushes the boundaries of knowledge by demonstrating the varying conditions under which the effect of sustainable project management on project success could be achieved via operational excellence. The remaining parts of the paper are organized as follows: a literature review is provided in Section 2; Section 3 provides the methodology and data analysis presented and discussed in Section 4. The last section presents a conclusion, limitations, and suggestions for further study.

## **Theoretical Background and Hypotheses Development**

### **Natural Resource Based View Theory**

The Natural Resource-Based View (NRBV) hypothesis is an extension of the firm's Resource-Based View (RBV) that emphasizes on natural resources as a vital component of a firm's competitive advantage (Rahman et al., 2021). It contends that a company's ownership and

smart use of unique, rare, and precious natural resources contribute considerably to its long-term competitive advantage (Greve, 2021). According to the idea, corporations may gain a competitive advantage by properly managing and utilizing their natural resource endowments, which may include physical resources like lands, minerals, energy, and biological resources (Iqbal and Ahmad, 2021). The Natural Resource-Based View (NRBV) the theory is very significant in the context of sustainable project management in developing economies. In these economies, sustainable project management entails ensuring that initiatives are not only economically feasible but also ecologically and socially sustainable (Haldorai et al., 2022). Firms may strategically connect their natural resource utilization with sustainable practices by implementing NRBV principles, taking into account environmental and social effect mitigation (Shibin et al., 2020). This alignment strengthens the firm's competitive position by showing responsible resource management, fulfilling stakeholder expectations, adhering to rules, and ultimately contributing to the long-term success and performance of projects and the organization in the growing economy.

### **Hypothesis Development**

#### **Sustainable Project Management on Project success**

Project success is defined as the completion of stated project objectives and goals in a manner that meets stakeholder expectations while following to constraints such as time, money, quality, and scope (Oviedo-Trespacios et al., 2019; Sehnem et al., 2019). In accordance with Sony (2019), there is a reciprocal relationship between operational excellence and project success. According to Persyn et al (2022), operational excellence creates the framework for initiatives to succeed. Polyzos and Tsiotas (2020), on the other hand, find a positive relationship between sustainability practices and project performance, emphasizing the significance of adopting sustainability as a key component of project management techniques. However, according to Mehrabad et al (2017), effective stakeholder involvement is critical for the success of sustainable initiatives because it fosters cooperation, trust, and shared decision-making. Furthermore, Saengchai and Jermsittiparsert (2019) suggested that implementing sustainable principles, such as waste reduction and energy efficiency promotion, increases the likelihood that projects would accomplish their goals and contribute to a more sustainable future. According to Zaman et al (2020), projects that prioritize environmental responsibility, social equality, and economic viability are not only more likely to be finished on time and under budget, but are also more likely to achieve intended goals. Furthermore, Iqbal and Ahmad (2021) contend that, by introducing sustainable practices into project management, organizations may show their commitment to social and environmental responsibility, improving their image and trustworthiness among stakeholders. These results in enhanced trust and support from stakeholders, eventually improving the project's overall success. Furthermore, Shibin et al (2020) observed that sustainable project management may boost innovation and creativity by encouraging the study of different ideas and solutions while keeping the triple bottom line in mind. Hence, it was hypothesis that

*H1. Sustainable Project Management has significant positive effect on Project success*

#### **Operational Excellence on Project Success**

Project success is defined as the completion of project objectives and goals within the set constraints of time, money, quality, scope, and stakeholder expectations (El Khatib et al., 2022). According to Carvalho et al (2019), the relationship between operational excellence

and project success is complicated and mutually reinforcing. Khatib et al (2022) stressed that operational excellence provides the infrastructure and guiding principles essential for efficient project execution. According to Sehnem et al (2019), firms that promote operational excellence via efficient procedures and continuous improvement practices have a better percentage of project success. This emphasizes the significance of incorporating ideas of operational excellence into project management techniques. Furthermore, Bag et al (2020) discovered that operational excellence practices like lean management and Six Sigma improve project success by eliminating waste, increasing quality, and boosting overall project performance. Alternatively, Bag et al (2020) back up these results by indicating that organizations that prioritize operational excellence in their project management strategy are more likely to complete projects on time and on budget. According to Sony (2019), project managers must not only concentrate on the technical elements of project execution, but also apply operational excellence concepts to improve overall project success. According to Rahman et al (2021), the synergy between operational excellence and project success arises from their shared goal of improving processes, producing value, and maintaining a quality focus in order to effectively accomplish organizational goals and meet stakeholder expectations. Hence, it was hypothesis that

*H2. Operational excellence has significant positive effect on Project success*

### **Moderating role of Operational excellence on the relationship Sustainable Project Management on Project success**

The significance of operational excellence in optimizing the relationship between sustainable project management (SPM) and project performance cannot be overstated (Ali et al., 2021). According to Jermittiparsert et al (2019), sustainable project management entails integrating environmental, social, and economic considerations into project design and execution, encouraging efficiency, eliminating waste, and improving overall project performance. Alternatively, Zaman (2020) noted that the basis for efficiently allocating resources, simplifying processes, and concentrating on continual development, all of which are essential for successfully implementing sustainable practices into project objectives. In the opinion of Abbas et al (2020), operational excellence enables a seamless synthesis of sustainability principles and project success by controlling this relationship, resulting in outcomes that benefit not only the project stakeholders but also the environment and society at large. Furthermore, Carvalho et al (2019) believed that, operational excellence moderates by enabling for reliable monitoring and assessment of the impact of sustainable practices on project performance. According to Armenia et al (2023), operational excellence provides the tools and methods required to assess the growth and efficiency of sustainability operations throughout the project's lifecycle. Stanitsas et al (2021) assumed educated decision-making, gradual improvements, and a proactive approach to integrating sustainability goals with project objectives. Almashhadani et al (2023) suggested that operational excellence serves as a catalyst for increasing the total beneficial effect of sustainability on project performance by optimising processes and cultivating a culture of continuous improvement, resulting in more sustainable and successful project outputs.

*H3. Operational excellence moderates the relationship Sustainable Project Management on Project success*

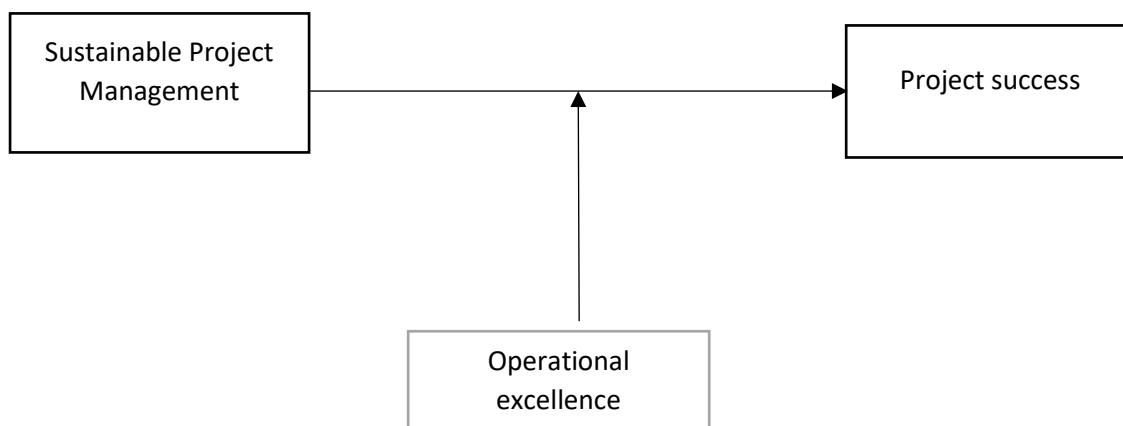


Figure 1 Research Model

## Material and Methods

### Sample

The hypothesized model was tested with survey data from construction firms in Ghana. The survey method is usually appropriate for management studies because it offers a convenient way to collect primary data about a phenomenon that is difficult to measure with secondary data (Yang et al., 2022). Senior managers of firms were purposively sampled for this study. The researchers deemed it was appropriate to administer the questionnaire to these managers because they have the necessary knowledge about the phenomenon under investigation. Appropriate permissions were sought from both the organizations and the target respondents used in the study. Participation in the study was purely voluntary and confidentiality was also highlighted prior to the questionnaire administration. The demographic data shows that 69.9% of the participants were males and 30.1% were females. Also, majority of the sample (38.2%) fell within 21-30 years, while the participants with 51+ years were the lower representation of the sample (5.6%). Majority (35.7%) of the participants had first degree, while those with others (10.0%) and PhD (10.3%) had lower representation of the sample. Majority (36.2%) of the sample had been in their position for 2-5 years while only 3.6% had been in their position for 16+ years. Also, 39.8% indicating the larger proportion of the sample had worked in their firm for 6-10 years and 6.1% indicating lower proportion of the sample had worked for 16+ years. Again, firms with more than 16 years (54.0) represents majority of the sample while those with less than 2 years (2.5%) represents lower proportion of the sample.

### Measures

The items to measure the variables were adapted from peer reviewed articles published in the project management research domain. The SPM construct was adapted from Silviu et al. (2017) and contained 14 items. These items were selected because they reflect relevant literature that links sustainability aspects to project management. The PS items mainly relate to respondents' perceptions on the success of their projects from the customer acceptance/satisfaction and project efficiency (scope, budget, time) perspectives. Organizational excellence is used as moderating variable using three key factors of organizational excellence of high performance (Darling & Nurmi, 1995; Pinar & Girard, 2008):

constant innovation, committed people and customer focus. All the dimensions of the construct are all covered by those items adapted from (Pinar and Girard, 2008).

### **Survey and Common Method Bias**

We thoroughly examined the data for outliers and missing values. For missing values, all cases lower than 95% response rate to the items were deleted. We subsequently employed the expectation maximization method to treat missing values in the dataset (Hair et al., 2014). We also employed both the graphical presentation and the calculated Mahalanobis distance to confirm the absence of outliers in the dataset. We further employed both methodological and statistical analyses to check for the absence of biases in the data gathered in this study. First, we compared the characteristics of the firms used in this study to those that did not respond (as a proxy for non-response bias), and it was evident that, considering the number of products produced and years of operation, there was no statistical difference. Similarly, we also divided the data gathered into two waves (early and late responses). A paired sample t test was conducted, and the result revealed no significant difference between the two groups, also confirming the absence of non-response bias (Clottey and Benton, 2013; Greco et al., 2015). We also implemented different methodological remedies to eliminate the possibility of survey bias in the study (Podsakoff et al., 2012). Firstly, for a few participants who had problems grasping the concepts under investigation, questions were explained to them. This action was taken as part of an effort to lessen the influence of bias in the data used. Additionally, respondents were guaranteed that, their anonymized responses would be kept secret. This was to check for a socially desirable response (Baumgartner and Weijters, 2012). Additionally, we checked for common method bias using the total variance explained (MacKenzie and Podsakof, 2012). The result revealed that, the highest variation explained by one component (33.5%) was less than the 50% threshold (see Table 2). Based on this method, our findings rule out the presence of common method bias (Reio, 2010; Baumgartner and Weijters, 2012). We further used the Partialing Out of General Factor in the PLS Model technique, as suggested by Tehseen et al (2017), because some researchers have argued that Harman's one-factor test is insufficient to give evidence of CMB. The result using the Partialing Out of General Factor in the PLS Model technique confirmed that after accounting for the general component, there was no appreciable change in  $R^2$  (0.020). We therefore conclude that common method bias is not a serious problem in this study.

### **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 programme SPSS was employed for conducting exploratory factor analysis (EFA), whereas Amos was utilised to conduct confirmatory factor analysis (CFA). The structural model underwent evaluation through the utilisation 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 in relation to the available data. Its primary objective is to minimise 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 (Norazlan et al., 2014). 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 of Measurement Indicators

After all the preliminary checks, we assessed both univariate and multivariate normality assumptions to assess the distribution of the dataset using SPSS. The results in Table 1 show 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 ( $\chi^2= 2600.952$ , df: 91,  $p =0.000$ ), while the results of the Kaiser-Meyer-Olkin's measure of sampling adequacy were 87%. The results confirmed factorability and the validity of the sampling strategy (Hair et al., 2019). Results as displayed in Table 1 further indicated three (3) factors were extracted with eigenvalues >1 and % of variance explained ranging between 11.736 and 44.908. Thus, items loaded perfectly on their respective constructs (see Table 1).

Table 1  
*Descriptive Statistics & Exploratory Factor Analysis*

Descriptive statistics						Component				
Constructs	Items	Mean	StD	Skewness	Kurtosis	1	2	3	Eigenvalues	% Explained
Sustainable Project Management	SPM1	4.40	1.383	-0.615	-0.244	0.121	<b>0.832</b>	0.056	6.287	44.908
	SPM2	4.378	1.588	-0.632	0.505	0.139	<b>0.795</b>	0.057		
	SPM3	4.167	1.637	-0.463	0.746	0.225	<b>0.844</b>	0.167		
	SMP4	4.226	1.516	-0.535	0.456	0.106	<b>0.878</b>	0.175		
	SPM5	3.967	1.687	-0.313	0.904	0.063	<b>0.832</b>	0.172		
Operational Excellence	OE1	4.470	1.410	-0.575	0.118	0.784	0.147	0.225	2.597	18.549
	OE2	4.156	1.636	-0.437	0.754	<b>0.834</b>	0.135	0.250		
	OE3	3.966	1.846	-0.243	1.099	<b>0.852</b>	0.073	0.167		
	OE4	3.903	1.823	-0.159	1.157	<b>0.853</b>	0.133	0.271		
	OE5	4.673	1.493	-0.627	0.071	<b>0.774</b>	0.190	0.154		
Project Success	PS1	4.723	1.363	-0.642	0.269	0.198	0.139	<b>0.846</b>	1.643	11.736



PS2	4.77	1.33	-0.566	-	0.295	0.141	<b>0.880</b>
		0		0.428			
PS3	4.80	1.35	-0.529	-	0.244	0.154	<b>0.857</b>
		9		0.404			
PS4	4.68	1.38	-0.531	-	0.208	0.128	<b>0.774</b>
		6		0.354			
					KMO		0.870
					Bartlett's Test	$\chi^2$	2600.952
					of	df	91
					Sphericity	Sig.	0.000

We further employed covariance-based confirmatory factor analysis (CFA) to evaluate scale validity and reliability. We retained items with factor loadings above 0.7; thus, an item of project success was lower than 0.7 and hence were deleted. The results of the retained items (see Table 2) showed that Cronbach's alpha ( $\alpha$ ), composite reliability, and AVE are all above the recommended thresholds (i.e., CA and CR >0.7 and AVE >0.5) (Bagozzi and Yi, 2012; Schumacher et al., 2019). The findings collectively indicated that, the attainment of scale reliability, unidimensionality, and convergent validity has been demonstrated. Additionally, Table 4 revealed that  $\sqrt{AVE}$  values were found to be greater than the shared variances among the constructs, indicating that the measures had discriminant validity (Hair et al., 2014). Again, VIF values in Table 3 were also found within acceptable threshold ( $\pm 3$ ), indicating multicollinearity was not an issue in this study. The model fit result shows the three (3) factors fit well with the data, with  $\chi^2 = 182.553$ ,  $DF = 62$ , normed  $\chi^2 = 2.944$ ,  $RMSEA = 0.089$ ,  $TLI=0.937$ ;  $CFI = 0.950$ ,  $NFI = 0.926$ ,  $RFI = 0.907$ . The results suggest all the recommended thresholds were met, indicating adequate fit for the model (Bagozzi and Yi, 2012).

Table 2  
*Reliability and Validity*

Constructs	Items	Loadings	CA	CR	AVE
Sustainable Project Management	SPM1	0.826	0.907	0.908	0.667
	SPM2	0.905			
	SPM3	0.881			
	SPM4	0.704			
	SPM5	0.749			
Operational Excellence	OE1	0.745	0.909	0.911	0.674
	OE2	0.897			
	OE3	0.832			
	OE4	0.847			
	OE5	0.775			
Project Success	PS1	0.832	0.914	0.920	0.795
	PS2	0.999			
	PS3	0.833			

Table 3  
*Discriminant Validity Test*

Constructs	1	2	3	VIF
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Project Success	<b>0.892</b>		
Sustainable Project Management	.332**	<b>0.817</b>	1.126
Operational Excellence	.509**	.334**	<b>0.821</b>

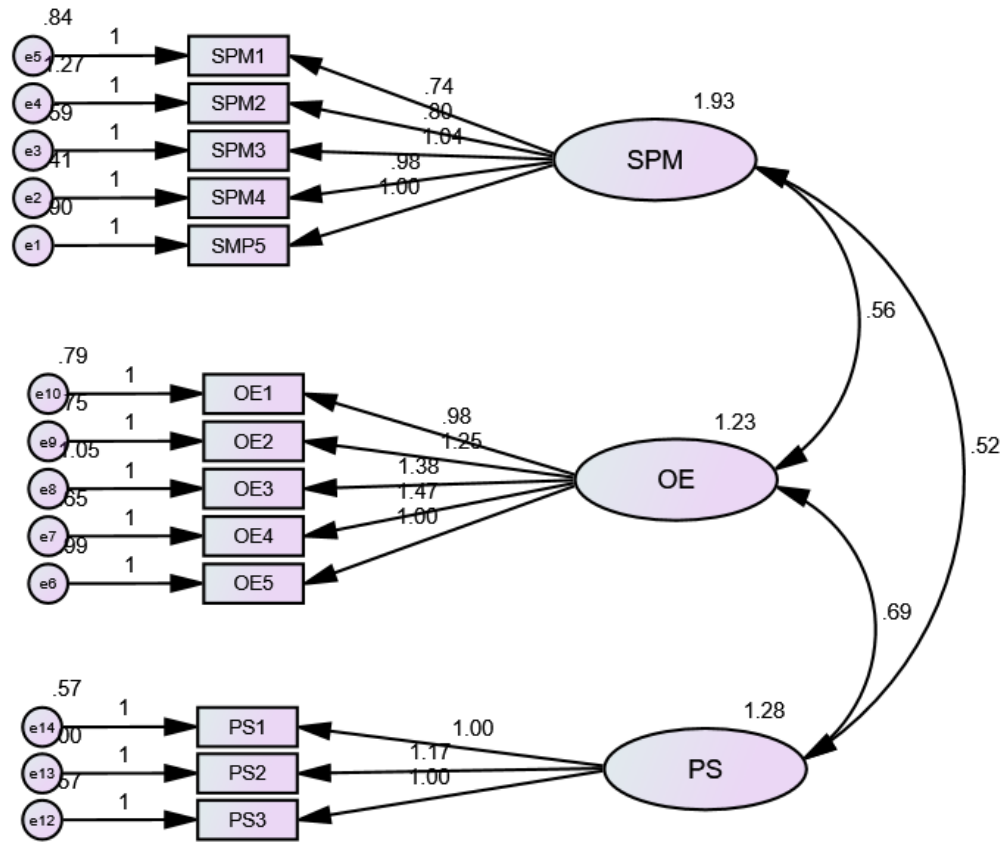


Figure 4.1: Measurement Model Assessment

**Model Testing**

Ordinary Least Square Estimation Method was used to estimate the conceptual model. The result showed a significant positive association between sustainable project management → project success link ( $\beta=.1428$ ;  $p<.05$ ). Hence, the first hypothesis is supported and we conclude that sustainable project management has significant influence on project success. Secondly, we also found a significant effect of operational excellence → project success ( $\beta=.1929$ ;  $p<.05$ ). Thirdly, the moderating impact of operational excellence on the sustainable project management→ project success link was found to be statistically significant ( $\beta=.1267$ ;  $p<.05$ ).

Table 4

*Structural Model*

	<b>Dependent Variables</b>
	<b>Project Success</b>
	<b>Coeffic. (p)</b>
<b>Main Effect</b>	
Sustainable Project Management	.1428**(.0271)
Operational Excellence	.1929***(.0000)
<b>Interaction Effect</b>	
Operational Excellence * Sustainable Project Management	.1267 (.0003)
<b>Model Summary</b>	
R2	0.5918
F-test	42.7628
P-Value	0.0000

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

**Discussion of Findings and Implication**

Our results showed that, sustainable project management positively affects project success, suggesting that higher levels of sustainable project management, may improve the project success of the construction firms. Our findings support previous studies Carvalho & Rabechini (2017); Dubois & Silvius (2020); Ika & Pinto (2022); Silvius & Schipper (2015) who also highlight the role of sustainable project management in project success. According to Silvius and Schipper (2014), sustainable project management includes not only environmental but also social and economic factors. Their research discovered that, initiatives that include sustainability principles have a wider view of success, emphasizing long-term social benefits, stakeholder participation, and resource efficiency. This is consistent with the notion that the success of a project should be assessed not only by its completion within scope, schedule, and money, but also by its good influence on society and the environment. Furthermore, research by Chow et al (2021); Klaus-Rosińska and Iwko (2021) highlights the necessity for a change in project management practices towards sustainability. Traditional project management frameworks, they believe, may fall short of tackling the challenges of sustainable initiatives. According to the results, sustainable project management incorporates concerns of environmental effect, social responsibility, and economic sustainability, which necessitates different tools, strategies, and attitude than traditional project management.

Next, our study found that operational excellence played an essential moderating role in the sustainable project management and project success relationship. The findings suggest that, organizations that excel in their operational processes and management practices are better positioned to deploy sustainable project management strategies. The findings support earlier studies Bag et al (2023); Jäger et al (2014); Sony (2019); Wojtkowiak & Cyplik (2020) who emphasize the immense role played by operational excellence in project success. Fernandez-Heredia and Fernandez-Sanchez (2020) highlighted the significance of integrating sustainable practices into operational procedures. They contend that operational excellence, defined by efficient resource utilization and simplified procedures, is required for efficiently executing

sustainable projects. This is consistent with the idea that operational excellence serves as a facilitator, ensuring that sustainable project management practices are effectively carried out, increasing the chance of overall project success. Furthermore, research by Herath and Chong (2021); Kafaji (2022) suggests that project performance is based not just on project management approaches but also on the operational skills of the organization. When there is operational excellence, it means that sustainable project management practices may be seamlessly incorporated into the organization's normal operating procedures, making sustainability an intrinsic component of project delivery. Also, Emuze et al (2023) study emphasizes the need of performance measuring and monitoring in sustainable project management. Operational excellence is critical in allowing organizations to successfully monitor, track, and report on performance metrics linked to sustainability. This capacity to evaluate and improve sustainability results is critical for project success while staying on track with long-term objectives. Furthermore, the results are consistent with Liute and De Giacomo (2022) idea of a "triple bottom line" approach, in which success is measured not just on economic but also on social and environmental aspects. Operational excellence ensures that sustainability concerns are integrated in everyday operations, allowing organizations to efficiently balance economic, social, and environmental factors, contributing to overall project success.

### **Theoretical Implications**

The study contributes to the Natural Resource-Based View (NRBV) theory. According to the theory, businesses may acquire a persistent competitive advantage by effectively managing and using important resources and capabilities, which include natural resources and operational capabilities. First, by recognizing the importance of environmental and social resources, sustainable project management practices correspond with the NRBV paradigm. According to the results, organizations that integrate sustainability concepts into project management are more likely to succeed. This is consistent with the NRBV theory, which emphasizes the strategic use of precious resources, especially those associated with sustainability, to gain a competitive advantage. According to the results, operational excellence has a substantial impact in regulating the link between sustainable project management and project success. This is consistent with the NRBV theory's emphasis on operational capabilities as an important resource. Sustainability practices are effortlessly incorporated into the organization's standard operating procedures via operational excellence, making sustainability an essential element of project execution. This strategic integration of operational skills with sustainability principles strengthens the organization's competitive edge and project success. Furthermore, the NRBV theory emphasizes the dynamic character of resource-based advantages, implying that they may evolve and adapt. The results reinforce this theory by emphasizing the beneficial moderating influence of operational excellence. This suggests that organizations may improve their competitive advantage and project success by continuously developing and optimizing operational procedures to fit with sustainability objectives.

### **Managerial Implications**

The findings have far-reaching and substantial implications on companies and project management practices. First, the positive and significant impact of sustainable project management on project success emphasizes the growing relevance of incorporating sustainability concepts into project management. Organizations are realizing that, including

environmental, social, and economic considerations into project planning and execution not only adds to project success but also corresponds with global sustainability objectives. This indicates that, organizations should spend in project managers' training and capacity-building in order to successfully adopt sustainable practices. Second, the role of operational excellence in moderating the relationship between sustainable project management and project performance emphasizes the significance of efficient operational procedures in reaping the advantages of sustainability efforts. This means that organizations should prioritize developing operational skills, simplifying procedures, and implementing best practices in order to guarantee that, sustainability concepts are easily incorporated into project execution. Furthermore, it recommends that, organizations build performance assessment and monitoring procedures to evaluate the influence of sustainable practices on project results. Furthermore, the results indicated that, organizations that prioritize both sustainable project management and operational excellence are more likely to succeed with their projects. This suggests that, organizations should take a more holistic approach to project management, where sustainability is integrated into the entire project plan rather being handled as a separate feature. Collaboration between project management teams and operational departments is essential to ensuring that sustainability objectives are accomplished consistently throughout the project lifetime.

### **Conclusion**

The study seeks to understand how operational excellence could influence the direct link between sustainable project management and project success in the construction industry. The results highlight the crucial connection between sustainability and operational efficiency in the building sector. It confirms that construction companies can no longer afford to treat sustainability as an afterthought, but rather as an essential component of their project management strategies. Construction projects that are successful increasingly need not just ecologically and socially appropriate practices, but also optimized operational procedures. The positive moderating effect of operational excellence emphasizes that, accomplishing sustainability objectives is dependent on efficiently optimizing resources and processes, ensuring that sustainability is smoothly integrated into all aspects of project execution. To remain viable in an increasingly competitive and environmentally concerned business, construction companies must adopt a comprehensive strategy that balances sustainability and operational excellence.

### **Limitations and Future Research Directions**

Possible limitations of the study includes its sole reliance on questionnaire-based primary data gathering, which may restrict the depth of insights, and its focus on the construction firm, which may not completely capture the intricacies of other industries. More varied data sources, such as interviews and observations, should be explored in future study to give a fuller understanding of the link between sustainable project management, operational excellence, and project success. Extending the study to include other industries would also allow for a more comprehensive assessment of the effect of sustainability and operational excellence across sectors, as well as insights into sector-specific issues and possibilities.

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