Available online www.ejaet.com

European Journal of Advances in Engineering and Technology, 2024, 11(9):96-105

Research Article ISSN: 2394 - 658X

Development of a Value Management Model for the Implementation of Sustainable Construction Practice of Building Projects in South-South Nigeria

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ABSTRACT

Sustainable construction practice refers to those activities, actions, processes, methods and policies adopted during construction process so as to ensure a balance between environment, economy and society throughout the life cycle of a construction project both now and in the future. This study aimed at developing a value management model for the implementation of sustainable construction practice of building construction projects in South-South Nigeria. To achieve this the study examined value management as a tool for the implementation of sustainable construction practice. The study also examined the relationships between the constructs of the model in order ascertain the model fitness. Survey research method was adopted for the study. Questionnaires were administered to decision making professionals: Quantity Surveyors; Architects; Builders; Engineers and Town Planners in the construction industry using probability sampling technique. A total of 327 questionnaires copies were distributed and 217 completed responses were received. Questionnaires were administered through online services. In the form of descriptive and inferential statistical measures, the data were analysed using: frequency distribution (percentages); relative importance index (RII), analysis of variance (ANOVA); and Structural Equation Modelling (SmartPLS v4.0.9.8 software). The findings revealed that the respondents agreed with all the identified functions of value management as a tool for the implementation of sustainable construction practice. The path model analysis that was conducted showed that all the relationships were found to be significant. Thus, there is a link between sustainable construction practice and value management methodology. The study concludes that value management is a tool that plays an important role in the delivering of sustainable construction projects with maximum benefit when applied from the pre-construction phase through to post construction phase of a building project. The study therefore recommends, the need for the various professional bodies within the built environment to encourage the use of the developed model among their members. Also, recommends that sustainable building principles through value management methodology should be included at every stage of the construction process.

Keywords: Construction projects, Sustainable Construction, Sustainability, Implementation, Construction Industry

INTRODUCTION

The expansion of the building industry and its negative effects on the environment highlights the significance of the need for sustainable construction practice and practical methods of managing sustainability measures (Daibi-Oruene, Ebiloma and Bumaa, 2017). Simon-Eigbe, Osuizugbo, Idowu and Ewah (2022) assert that the construction industry makes many positive contributions to the society, but it also has negative impacts on the environment. Pressure on construction organisations to implement sustainable construction in their construction process is growing as a result of the need to reduce the negative consequences of construction operations (Akadiri, Chinyio and Olomolaiye, 2012). Esezobor (2016) in corroboration explained that the need to lessen the unfriendly side effect of construction activities is increasing tension on construction organizations to take up sustainable strategies in their construction process.

Those participating in the construction process, including Architects, Designers, Engineers, Quantity Surveyors, Builders and others, have a special chance to lessen environmental effect through the implementation of sustainability goals during building design and construction stage. To create a sustainable building, a process must be used to maximize each component of the design. As part of a complete building solution, the impact and interaction of the many parts and systems inside the building and site are re-evaluated, integrated, and optimized (Al-Yami and Price, 2006). If the interactions between the building site, site features, the sun's path, the location and orientation of the building, and elements like windows and external shading devices are not taken into account early on in the design process, the design will not be properly optimized. This will probably lead to an extremely inefficient structure.

Sustainable construction is applied throughout the entire life cycle of construction, from preconstruction to disposal of the building (Aghimien, Oke and Adegbembo, 2018). Particular focus has been placed on development initiatives that are carried out in a more considered and responsible manner with future generations in mind since the advent of the sustainability agenda (Okoye, Odesola and Okolie, 2020; Abidin, 2010).

Although there has been and is still a lot of study being done in the field of sustainability, Akadiri et al., (2012); Nazirah and Ijias, (2006); Oke et al. (2015) note that the environmental pillar typically receives more attention. While the environmental component is crucial, equal focus must be given to the pillars of economic and social sustainability in order to strike a balance. Yeomans cited in Oke et al. (2015) claims that this can be accomplished through value management (VM). This was supported by Nazirah and Ijias (2006), who claim that VM is a method used to aid decision-making and has a vital role in integrating sustainability concerns into construction projects. Value Management is one of these technologies that is currently becoming more and more popular in both the developed and developing nations (Al-Saleh and Taleb, 2020; Akadiri et al. 2012; Ametepey et al., 2015). In the light of this, this study seeks to develop a value management model for the implementation of sustainable construction practice in South-South Nigeria. To achieve the aim of this study, the study examined value management as a tool for the implementation SCP and developed a value management model for the implementation of SCP.

LITERATURE REVIEW

The current state of the Nigerian construction sector, along with its operational procedures, does not facilitate the realisation of sustainable construction (Aghimien et al., 2018). In the report of Oke et al. (2018) suggested reviewing the industry's construction practices and activities in order to create sustainable structures. According to Hill and Bowen (1997) sustainable construction is founded on the four pillars of sustainability. The decision to construct green should be made during the conceptual design stage of the first design. According to Braganca et al, referenced in Ade-Ojo (2019), the conceptual stage is the most crucial for incorporating green features into a building development. The conceptual design stage primarily addresses issues relating to building form, function, and the reciprocal relationship with the immediate environment (Isang, 2023). The thermal performance of the building envelope, daylighting and shading systems, natural ventilation, renewable energy systems (such as solar power supply), and water resources (such as water-saving toiletries, grey water management systems, and solid waste management systems) are some of these features.

Increased calls for the adoption and subsequent implementation of sustainable construction (SC) in the various sectors have arisen as a result of the deteriorating climatic conditions that are perceived as consequences of global warming, resource depletion, land degradation, and water and air pollution, among others. The construction industry (CI) has come into emphasis because of its connections to other sectors. There is evidence to support the claim that it is the primary cause of the disruption of the ecosystem and the depletion of the earth's resources (Alsanad, 2015; Opoku and Ahmed, 2014). The CI's reaction to this appeal is known as sustainable construction (SC), and sustainable construction practices are the means by which the institutions participating in this sector apply the sustainable development (SD guidelines to their operations and job plans. Atombo et al. (2019); Elmualim and Alp (2016); Esezobor (2016); Kinebar and Hamed (2022) corroborate that SC is the implementation of SD concepts throughout the whole building cycle, beginning with the planning and design phases and continuing through the actual construction phase, which encompasses the manufacturing of materials. Operation and maintenance are the final two phases, which are then followed by deconstruction and management of the generated garbage.

Policymakers now more than ever view the idea of sustainability and its practical application as one of the most important tools for striking the correct balance between economic, social, and environmental goals (Abolore, 2012).

More requests for the construction industry to provide buildings that support sustainability on a social, economic, and environmental level have given rise to a number of cutting-edge innovations. Additionally, the development of construction management tools such as value management (VM), lean management (LM), facility management (FM), and building information modeling (BIM), among others, has been driven by the competitive nature of the industry and firms' quest to ensure that projects of a high quality are delivered on time and within budget (Oke and Aigbavboa, 2017).

To create a framework that encourages the adoption of sustainability principles in the future, Oke et al. (2015); Olarewaju, 2013 combined life-cycle thinking with the three sustainability pillars. A collaborative platform involving all project stakeholders would lead to better alignment of their expectations, while lifecycle assessment is necessary to shift the focus from immediate costs to the long-term benefits of involved stakeholders. To that aim, a strong framework for implementation that includes unambiguous legal requirements and transparent public consultation procedures is crucial (Aghimien et al., 2018; Aigbavboa, Ohiomah and Zwane, 2017; Oke et al., 2015; Olarewaju, 2013).

The role of VM in the delivery of sustainable construction has been surveyed by several researches. Abidin and Ijias (2006); Aghimien et al. (2018); Oke et al. (2018) assessed the use of VM in the conveyance of economically sustainable constructions using a case study methodology, the researchers found that implementing value management on a construction project can lead to significant economic sustainability since it gives participants the chance to make sure that the project offers options for obtaining better value for the money. They did, however, caution that doing so would mean being careful not to upset the balance between the environmental, economic, and social pillars of sustainability. In the same vein, to provide sustainable building, Aghimien et al. (2018) looked into the use of VM and its advantages. Data were gathered using a questionnaire as they used a survey approach. Findings showed that although construction professionals are relatively knowledgeable about VM practice, their implementation of the technique is still of poor quality. Abidin and Ijias (2006) in his study opine that VM may be applied effectively and efficiently to support decision-making and can play a key role in integrating sustainability concerns into building projects. Value management (VM) and whole life costing in construction projects were critically examined by Olanrewaju (2013), he pointed out that VM aims to achieve the best functional balance between cost, quality, reliability, safety, and aesthetics and explicitly states the client's value system at the project's conceptual stage.

METHODOLOGY

Research Design

The study used a descriptive survey methodology. The instrument used to collect the data was a structured questionnaire. Professionals in the construction industry, including Architects, Builders, Engineers, Quantity surveyors and Urban and Regional Planners (Town Planners) were given the questionnaire. The population selected for the study was as a result of the essential knowledge and skills possessed by construction professionals required to design, execute and manage sustainable buildings to meet sustainable construction projects' objectives. Hence all relevant stakeholders must be involved for effective implementation.

Preliminary survey of the study revealed that a total of one thousand, eight hundred and two (1802) comprising of five hundred and eighty-three (583) in Edo, seven hundred and twenty-one (721) in Delta and four hundred and ninety-eight (498) in Bayelsa were used in the study area. Therefore, the population for this study covered 1802 respondents.

Sample Size and Sampling Technique

According to Easton in Pallant (2016) the term 'sample' means "a specimen or part of a whole (population) which is drawn to show what the rest is like". A sample is precisely a part of the population; and the procedure for drawing samples from a population is known as sampling (Kothari, 2004; Fellows and Liu; 2015). The sample size for this study was determined using Taro Yamane's formula, Yamane (1978).

$n = N/(1+N(e)^2)$

When n = sample size

N = population

e2 = Margin of error (assumed 5%)

1 = unity or constant

Therefore, the sample size adopted for the research is 327.

Probability sampling technique was employed for the study and this was to ensure that the sample is a representative of the population, allowing for accurate generalizations. Multi-stage sampling procedure was used in selecting the desired respondents. First, cluster sampling technique was employed where the samples were proportionally divided into three to ensure that the respondents from each of the three states in the study area were adequately represented in the survey (area coverage). Secondly, a simple random sampling technique was used in choosing the respondents from each state (cluster). This technique afforded every participant equal and fair chance of being selected for inclusion in the sample.

The questionnaire method was developed as data collection instrument for this study. The questionnaire designed for this study was structured questionnaire (multiple choices) and included closed ended questions. A Likert-scale with a range of 1 to 5 (Strongly Disagree to Strongly Agree) was employed. The statements made therein were measured accordingly. In an effort to ensure the validity of the instrument, the instrument was subjected to face validity, content validity and construct validity. Face validity was ensured by a robust examination of the literature, sample adequacy, sample representativeness, the use of correct relevant data processing tools, correct data analysis, interpretation and justifiable conclusions.

Method of Data Analysis

A total of three hundred and twenty-seven (327) questionnaires was distributed to construction professionals through online. A sample of three hundred and twenty-seven (327) was calculated as adequate for a population of 1802 respondents. The questionnaire was sent out and two hundred and seventeen (217) responses were received and found useful for further research purposes. In the form of descriptive and inferential statistical measures, the data were analysed using the following techniques: relative frequency distribution (percentages); mean item score (MIS), relative importance index (RII), analysis of variance (ANOVA); and Structural Equation Modelling (SmartPLS v4.0.9.8 software).

RESULTS AND DISCUSSION

Characteristics of the Respondents

The study collected basic information regarding the participants and the organizations in which they work. According to Fellows and Liu (2015) reporting the sample characteristics enables research consumers to determine the representativeness of the sample and applicability of findings in their settings. Table 1 shows the characteristics of the respondents.

As indicated, Table 1 shows the type of organisation of respondents where 60 respondents representing 27.6% are from construction company/organisation, 55 respondents representing 25.3 are from contract/contracting firm, 41 respondents representing 18.9% constituted the consulting firm, 36 respondents representing 16.6% of the populaiton are others from educational background. The remaining 13 and 12 respondents representing 6.1% and 5.5% are from public contracting firm and public consulting firm respectively.

The professional background of the respondents, 34.6% were Quantity Surveyors, 20.7% were Builders, 14.3% were Engineers, 13.8% were Town Planners and 12.9% were Architects. Other professionals within the industry constituted the 3.7% (Table 1).

Table 1 further shows the academic qualification of the Respondents where 73 respondents representing 33.6% possessed M.Tech/M.Sc degree, 66 respondents representing 30.4% have HND, 63 respondents representing 28.6% possessed B.Tech/BSc while 16 respondents representing 7.4% possessed PhD.

Also, shown in Table 1 are 39 respondents representing that 18% have worked between 1-5 years, 31 respondents representing 14.3% have worked between 6-10 years, 47 respondents representing 21.7% have worked between 11-15 years and 66 respondents representing 30.4% have worked between 16-29 years, while 34 respondents, representing 15.7% have worked over 20 years. The trend therefore, shows that majority of the respondents are experienced and as such can provide informed opinion about the subject matter.

Table 1: Analysis of Background Information

Variable	Characteristics	Frequency	Percentage (%)	Total
Institutional Organization	Contract/Contracting firm	55	25.3	
	Construction Company/Organization	60	27.6	
	Consulting Firm	41	18.9	
	Government (Public Contracting)	13	6.0	
	Government (Public Consulting)	12	5.5	
	Other (Education etc.)	36	6.6	217
Profession	Architect	28	12.9	
	Quantity Surveyor	75	34.6	
	Engineer (MEP or Civil)	31	14.3	
	Builders	45	20.7	
	Town Planners	30	13.8	
	Others	8	3.7	217
Qualification	OND/ND	-	-	
	HND	66	30.4	
	BSc/BTech	62	28.6	
	MSc/MTech	73	33.6	
	PhD	16	7.4	217
Years of Profession Experience	1-5	39	18	
	6-10	31	14.3	
	11-15	47	21.7	
	16-20	66	30.4	
	20years and above	34	15.7	217

Source: Author's field work (2024)

Value Management as a Tool for the Implementation of Sustainable Construction Practice

The Cronbach Alpha value for the data was quite high 0.919 and it was also greater than 0.90 for all the variables if an item was eliminated (Table 2) validating a good reliability. Additionally, the data's validity is quite good because every variable is significant at a 99% confidence level. According to the findings, respondents indicated that they agree with all the identified Value Management tool for the implementation of sustainable construction practice i.e. (VMISCP1 to VMISCP5) has they all have their RII between 0.7 and 0.89. Cumulatively, all the identified Value Management tool for the implementation of sustainable construction practice was agreed to by the respondents with an average RII of 0.83. The standard deviation also shows that the responses are spread out, having an average standard deviation of 0.97 (Table 2).

Table 2: Descriptive statistics of value management as Tool for the Implementation of SCP

Code	Variable name	Cronbach's Alpha if	Validity	RII	Std. Deviation
VMISCP2	It achieves high-quality performance with minimal resource utilization, maintaining a project's value and functionality through cost-effective delivery.	0.904	0.000	0.830	0.946
VMISCP3	Value Management maximizes project value through development, commissioning, and decision-making aligned with client-determined value systems.	0.900	0.000	0.830	0.946
VMISCP4	The systematic application of Value Management techniques identify functions, sets values, and develops alternatives for minimal cost, promoting value-oriented thinking, behaviour, and methods.	0.899	0.000	0.824	1.023
VMISCP1	Value Management tool employs a team-based systematic approach, analysing project functions for optimal value and cost reduction, aiming to maximize project value by defining necessary functions.	0.903	0.000	0.822	1.017
VMISCP5	Value Management evaluates project feasibility factors, incorporates sustainability, appreciates whole life cycle costs, and improves building programs by addressing over-specification.	0.897	0.000	0.822	0.894

Source: Author's field work (2024)

Development of the Conceptual Framework of the Study

In the field of construction management, models can be presented in graphical formats or mathematical expressions (Fellows and Liu, 2015). This study employed a structural modelling approach to represent the model in a graphic and visually comprehensible form in the development of a framework.

Covariance Base Structural Equation Modelling (CB-SEM) Model Assessments

All the CB-SEM model evaluations in the study were conducted using SmartPLS v4.0.9.8 software. The framework evaluations were done to evaluate the structural framework and validate the measurement framework. Each 'unobserved' construct's relationship to its indicators or 'observed' measurements is described by the measurement model. In turn, the (directly as well as indirectly) connections among the latent factors in the investigation's model are described and predicted by the structural framework. Prior to evaluating the structural model, the measurement model was validated. Notably, various statistical analyses were employed to evaluate the structural model as well as the reflective and formative measurement models. The route coefficient model created using SmartPLS software and converted from the research model is shown in Figure 1. "Mathematical calculation was performed by executing the CB- SEM algorithm and determining the numerical values of the established latent parameters following the route models was created in SmartPLS". This allowed the algorithm to calculate every load and indices in the structural model and measurement model inside a spectrum of -1 to +1. In addition, all calculations performed utilising the bootstrapping technique were configured to "no sign modifications, 5000 bootstrapping sampling" in consideration of the 217 samples in the data collection that were legitimate observable (Fig:1).

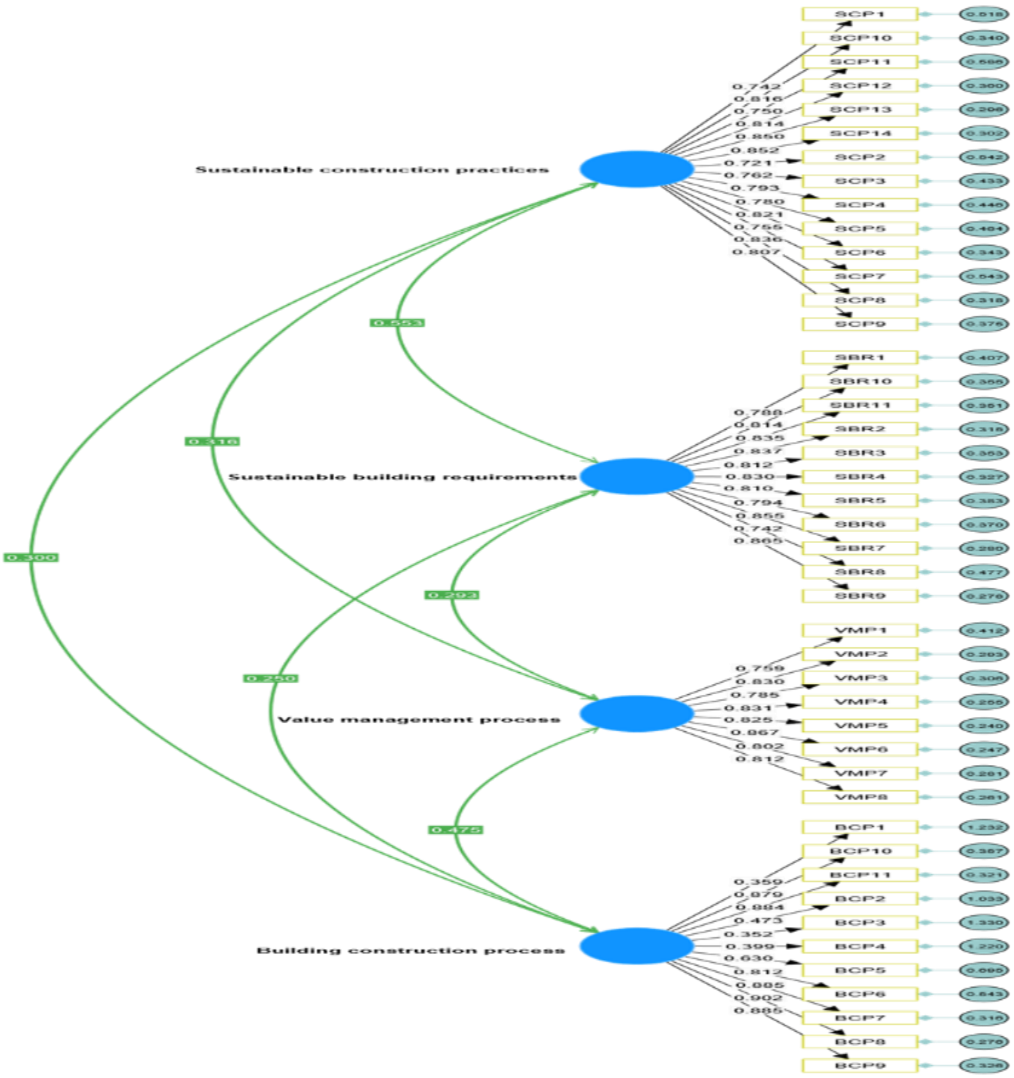

Figure 1: *Path coefficient model*

Evaluating the Measurement Model

Four reflective constructs i.e. Sustainable building requirement; Building construction process; Value management process and Sustainable construction practices make up the proposed measurement approach. The measurement model was validated using the evaluation standards for the reflective model. Indicator dependability (loads), validity based on discriminality, convergence validity, and inner dependability were all tested. The reflective measurement model's results all satisfy the assessment conditions, indicating the framework validity and reliability plus its suitability for calculating the structural framework. (Table 3).

Table 3: Summary of Reflective Measurement Model Assessment

Constructs	Variables	Outer loadings	AVE	Composite reliability	Cronbach's Alpha
Building Construction Process	BCP	0.884	0.512	0.914	0.920
Sustainable Building Requirement	SBR	0.837	0.668	0.957	0.957
Sustainable Construction Practices	SCP	0.814	0.630	0.959	0.960
Value Management Process	VMP	0.824	0.664	0.940	0.940

Source: Author's field work (2024)

Assessment of Structural Model

The validation of the structural model comes next after the reflective measurement model's validity and reliability were established. The evaluation concentrates on the path model, or the identification of the linkages that have been hypothesised. The significant result for the route coefficient is then tested using the bootstrapping tool in the

SmartPLS v4.0.9.8 software (Ramayah et al., 2018). In this investigation, the path coefficient ranged from 0.213 to 0.438. The significance of the path coefficient is calculated using the empirical *t* and *P* values. The study's adopted confidence interval of 95%. It is done to interpret the coefficient of determination (R^2). According to Hair et al. (2017), R^2 measures the variation in an endogenous construct that is explained by external constructs connected to it. Cohen (2019) deemed the R^2 for Value management methodology is weak ($R^2 < 0.26$) at 0.237. It accounts for 23.7% of the value management methodology variation. While the R^2 for sustainable construction practices is deemed to be weak ($R^2 < 0.26$) at 0.105. It accounts for 10.5% of the sustainable construction practices variation. Figures 2 shows the outcomes of the structural model's validation using standardised *p* values.

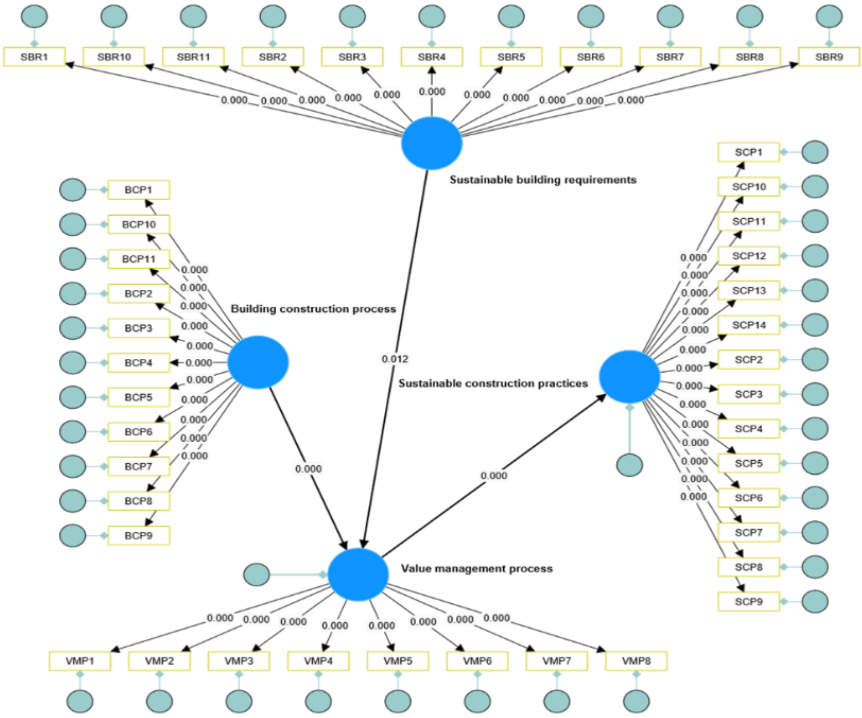

Figure 2*: Structural model with standardised p value*

Structural Model Fit

The structural model fit indices are as indicated in Table 4, the *P*-value was 0.00 significant at $P < 0.05$ indicating good fit. The Chi square /df (2.458) was significant at < 5.00 indicating good fit also. The Root Mean Square Error of Approximation (RMSEA) was 0.052 significant at < 0.06. Goodness of Fit Index (GFI) was 0.955 significant at > 0.90, Adjusted Goodness of Fit Index (AGFI) was 0.823 significant at > 0.80 all indicating good fit. Root Mean Square Residual (RMSR) was 0.084 significant at < 0.080 indicating an acceptable fit threshold. Normed Fit Index (NFI) 0.954, Tucker-Lewis Index (TLI) 0.929 and Comparative Fit Index (CFI) 0.937 were all significant at >0.90 indicating a good fit. The result of the measurement of the model's values produces outcomes that were appropriate for a model with a good fit.

Table 4: Model fit

Model fit indices	Recommended value (Hair et al., 2010)	Estimated model value
Chi-square		2755.238
Number of model parameters		104
Number of observations		217
Degrees of freedom		1121
P value	<0.05	0.00
ChiSqr/df	<5.00	2.458
Root Mean Square Error of Approximation (RMSEA)	<0.06	0.052
Goodness of Fit Index (GFI)	>0.90	0.955
Adjusted Goodness of Fit Index (AGFI)	>0.80	0.823
Standardised Root Mean Square Residual (SRMR)	<0.080	0.084
Normed Fit Index (NFI)	>0.90	0.954
Tucker-Lewis' index (TLI)	>0.90	0.929
Comparative Fit Index (CFI)	>0.90	0.937

Source: Hair et al. (2017)

Discussion of Findings

The research is based on value management as a tool for the implementation of sustainable construction practice with the view of developing a VM model for the implementation of sustainable construction practice in South-South Nigeria. The research explored quantitative method of data generation which comprised the design, pre-test and administration of structured questionnaire to construction professionals in three South-South states (Edo, Delta and Bayelsa State). Data and information obtained from the quantitative research instruments were used to test the fitness of the model.

The background information of the research population has the building construction professionals from Architects (12.9%) to Quantity Surveyors (34.6%), Engineers (14.3%), Builders (20.7%) and Town Planners (13.8%). A large proportion of the professionals approximately 33.6% have master's degrees in their various fields, 7.4% have PhD while 59% have either HND or B.Tech/ BSc degrees.

Value Management as a Tool for the Implementation of Sustainable Construction Practice

The findings, indicated that the respondents agreed with all the identified functions of Value Management as a tool for the implementation of sustainable construction practice. This implies that Value Management is a tool that plays an important role in delivery sustainable construction project with maximum benefit when applied at the pre-construction phase of a building project where the principles of sustainable construction practice can be applied to achieve sustainability. This finding supports the study of Aghimien et al. (2018) and Oke et al. (2015) as explained in the literature review.

The Model

The study developed a model which required the investigation of the interrelationship between the variables under study including value management potentials, factors that support the implementation of sustainable construction. The path model analysis that was conducted showed that all the three hypothesised relationships were found to be significant. There were three relationships between the independent variables and the dependent variables.

As revealed from the reviewed literature, a number of sustainable factors determine the integration of sustainable principles into construction projects. The evidence suggests that these factors need to be considered for successful application of sustainable principles, ensuring sustainable improvements in construction project. Developing a sustainable building requires a process to optimize every element of the design. The impact and interrelationship of the different elements and systems within the building and site are re-evaluated, integrated, and optimized as part of a whole building solution. This re-evaluation can only be achieved through value management process where the objectives would be defined, information gathered and analysed exploring alternative ways of achieving the same or better functionality. Findings of the literature reviewed suggest that development of a 'model' for managing sustainable project delivery, is based on effective sustainable principles. The study revealed that if VM is used as a tool to promote sustainable construction, it will help with the reduction of waste generation, material consumption, resource depletion, pollution and energy consumption which are the major sustainability issues in the construction industry in Nigeria, while ensuring the use of life cycle assessment (LCA), which is an integral function of the VM process. Thus, there is a link between sustainable construction principles and value management methodology. This finding supports the work of Ochieng et al. (2014) when they concluded that the integration of sustainable principles in construction project is significant to manage the current environment issue and attain significant improvements in performance. It also, aligns with the findings of Okoye et al. (2020) confirming that all the identified construction activities relating to environmental, economic and social sustainability are very important to the attainment of sustainable construction practice in the building industry noting that sustainable construction practice is very important to the survival of the building industry and mankind as a whole and as such, certain activities related to these practice are vital in the course of construction building process. Therefore, to achieve sustainability in construction, sustainable building requirements which are factors embedded in the sustainable construction principles must be considered at the orientation and information gathering stage (value management) of the project. This means there is a relationship between sustainable building requirements, building construction process and value management to achieve sustainable construction practice.

CONCLUSION

The study confirmed value management as a tool that plays an important role in delivery of sustainable construction projects with maximum benefit when applied at the pre-construction phase of a building project where the principles of sustainable construction can be considered early to achieve sustainability.

It was established that the goals and purposes of sustainability and value management are in agreement as sustainability scope corresponds with the direction of value management. Sustainability scope refers to the range of activities, processes, and practices that an organisation implements to minimise its environmental, social, and economic impacts. Value management direction, on the other hand, refers to the strategic approach an organisation takes to create, maintain, and optimise value for its stakeholders. In essence, aligning sustainability scope with value management direction ensures that an organisation's pursuit of value is harmonious with its commitment to sustainability, leading to a more responsible and thriving business model. Thus, strengthening the position of value management as a strategic mechanism to uplift sustainability. The results of the study highlight the necessity for a paradigm shift in construction practices, moving beyond conventional approaches to adopt a more holistic, sustainable methodology that combines the best of traditional and modern techniques. Furthermore, it underscores the need for government agencies and construction professionals to prioritise sustainable practices, prompting a call for all stakeholders involved in the industry to adopt a more environmentally conscious approach. The study therefore recommends, the need for the various professional bodies within the built environment to encourage the use of the developed model among their members. This will to a large extent increase the practice of sustainable construction. Construction clients can also be enlightened by these professionals as regards the immense benefits of adopting this practice. Sustainable building principles through value management practice should be included at every stage of the construction process for maximum benefit without compromising the structure's intended function to achieve sustainability.

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